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SUNDAY, SEPTEMBER 30, 2024

10:30 AM

Research Forum Exhibit Hall

RF1 Plenary 1

Room 1

1 Cost Comparison and Revenue Generation of Post-Graduate Education for Emergency Medicine Advanced Practice Providers
A Brogan, Mayo Clinic, Rochester, MN

2 Echocardiographic Activity in Patients Presenting With ECG Ventricular Fibrillation Is Associated With Increased Survival
R Gaspari, Umass Memorial Medical Center, Worcester, MA

3 Use of a Large-Language Model to Automate a Severe Sepsis and Septic Shock (SEP-1) Abstraction
G Wardi, University of California San Diego, San Diego, CA

4 Improving Survival and Reducing Readmissions: Early Nutritional Consultation Initiated via MNA-SF Assessment in Geriatric Emergency Patients
Y Chen, Taipei Veterans General Hospital, Taipei, Taiwan

5 Generative AI Summaries to Facilitate Emergency Department Handoff
N Genes, NYU Grossman School of Medicine, New York, NY

RF2 Administration & Operations

Room 2

6 The Emergency Department Sorting Hat: Trends in Triage Accuracy at a High-Volume, Multicultural County Emergency Department
M Arnold, Icahn School of Medicine at Mount Sinai, New York, NY

7 A Year-Long Review of Short Stay Admissions
E Madden, New York Presbyterian Weill Cornell, New York, NY

8 Market Share of Emergency Department Annual Visits by Physician Employer Group Ownership Type
A Cai, University of Pennsylvania, Philadelphia, PA

9 Triaging the Future: Emergency Physician Preferences Between Nurse and AI-Generated Triage Notes
J Varughese, Morristown Medical Center, Morristown, NJ

514 Impact of a Residency Run Podcast on Knowledge Retention and Attitudes Among Residents and Attending Physicians
C Reilly, Maimonides Medical Center, Brooklyn, NY

515 ECG Jeopardy: Use of an Institutional ECG Database for Curricular Design
R Menon, University of Maryland, Baltimore, MD

RF3 Airway

Room 3

11 The Effect of Apneic Oxygenation on End-Tidal Oxygen Concentration During Rapid Sequence Intubation
E Boccio, Memorial Healthcare System, Pembroke Pines, FL

12 Effect of Induction Agent Administration Sequence on Emergency Intubation Success: A Retrospective Bayesian Analysis of a Prospective Cohort
P Catoire, Sorbonne Université, Improving Emergency Care (IMPEC) FHU, Paris, France

13 Is the MACOCHA Score Better than Clinician Gestalt in the Emergency Department at Predicting Difficult Airways?
I Maia, University of São Paulo, Brazil

14 Some Emergency Department Patients Given Ketamine for Conscious Sedation Become Apneic
H Seliman, Morristown Medical Center, Morristown, NJ

72 Injuries Related to Non-Powder Firearms: A National Database Study
K Graham, Edward Via College of Osteopathic Medicine, Spartanburg, SC

RF4 Cardiovascular

Room 4

15 Diagnostic Performance of the MI^3 Machine Learning Algorithm in Patients With an Initial Indeterminate Troponin
S Mahler, Wake Forest University School of Medicine, Winston Salem, NC

16 Derivation of a Clinical Decision Aid to Rule Out Acute Aortic Syndrome in Patients Presenting to the Emergency Department With Chest Pain
R Ohle, Northern Ontario School of Medicine University, Health Sciences North Research Institute, Sudbury, Ontario, Canada

17 Determinants of Guideline-Directed Anticoagulation in Emergency Department Patients Admitted With Acute Pulmonary Embolism
W Stubblefield, Vanderbilt University Medical Center, Nashville, TN

18 Comparing the Accuracy of Modified HEART Scores for Risk Stratification of Low-risk Chest Pain Patients at the Emergency Department
D Phillips, John Peter Smith Hospital, Fort Worth, TX

19 Lack of Telehealth Capable Devices Among Patients With Heart Failure as a Barrier to Virtual Outpatient Follow-up Care
D Castillo, Icahn School of Medicine at Mount Sinai, New York, NY

20 Outcomes of Apixaban Versus Rivaroxaban in Patients With Nonvalvular Atrial Fibrillation
D Jehle, The University of Texas Medical Branch at Galveston, Galveston, TX

Poster 1

Poster Hall

351 Physician Self-Scheduling Trial for a Large Academic Multi-Site Emergency Department
L Oh, Emory University, Atlanta, GA

352 The Home Team Is in Town! The Emergency Department and EMS Will Be Nice and Quiet, Right?
S Dixit, Emory University, Atlanta, GA

353 Relative Productivity: A Data Driven Equitable Productivity Model
N Huth, Eastern Virginia Medical School, Norfolk, VA

354 Evaluating Outcomes of Patients With Suspected Pulmonary Embolism Using an Age-Adjusted Cutoff for a D-dimer Unit (DDU) Based Assay
M Butt, Maimonides Health, Brooklyn, NY

355 Thematic Analysis of Emergency Medicine Residents' Concerns Facing the Specialty of Emergency Medicine
T Gaeta, NYP Brooklyn Methodist Hospital, Brooklyn, NY

356 Variation in Duration of Emergency Department Boarding by Patient Demographics
C Prucnal, Massachusetts General Hospital, Boston, MA

357 The Use of a Data Mart for the Instantaneous Availability of Emergency Department Clinical Information
A Schwartz, Kaiser Permanente, San Diego, CA

SUNDAY, SEPTEMBER 30, 2024 —*cont'd*

358 Reduction in Emergency Department Length of Stay and Head CT Utilization With Implementation of Brainscope in Head Injury Evaluation
S Gupta, Zucker School of Medicine, Bay Shore, NY

359 Association of Test Utilization and the Emergency Department Provider Type
H Schneider, Hackensack University Medical Center, Hackensack, NJ

360 Does Emergency Department Treatment Daily Census Correlate With Patient-Hours of Care Provided: A Comparison of Data From Pre-COVID-19 (2018) to Post-COVID-19 (2022)
M Patel, Henry Ford Hospital, Detroit, MI

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11:30 AM

RF5 Critical Care (Sepsis)

Room 1

21 The Economic and Mortality Benefits of Delivering at Least 30ml/kg Within 3 Hours of Septic Shock Onset in the Emergency Department
M Piehl, WakeMed, Raleigh, NC

22 Exhaled $ETCO_2$ Measured at Emergency Department Triage Is Associated With Positive Blood Culture, ICU Admission and Early Mortality
J Ladde, Orlando Health, Orlando Regional Medical Center, Orlando, FL

23[EMF] Norepinephrine May Regulate Oxidative Stress in Sepsis
J Thoppil, University of Texas Southwestern Medical Center, Dallas, TX

24 Comparative Effectiveness of Normal Saline, Lactated Ringer's Solution, and Isolyte on Rate of Lactate Clearance in Shock
J White, St. Luke's University Health Network, Bethlehem, PA

25 The Effect of Early Fluid Resuscitation on Mortality in Sepsis: A Systematic Review
M Ward, University of Wisconsin Madison, Madison, WI

26 BMI Is Negatively Related to Initial Serum Lactate but Not Mortality in Emergency Department Sepsis Patients
M Arra, Washington University School of Medicine, St. Louis, MO

RF6 Diagnostics

Room 2

27 Utilizing Machine Learning in the Classification and Diagnosis of Lung Cancer: A Novel Approach
A Nguyen, California University of Science and Medicine, Colton, CA

28 Evaluating the Utility of Pelvic Ultrasound Following a Negative CT Pelvis in Women Presenting to the Emergency Department With Abdominal Pain
R Sangal, Yale New Haven Hospital, New Haven, CT

29 Host-Protein Test Impact on Antibiotic Prescription Rates in Adults With Suspected Lower Respiratory Tract Infection
A Singer, Stony Brook University, Stony Brook, NY

30 Point-of-Care Ultrasound by Emergency Physicians for the Diagnosis of Ectopic Pregnancies: How Good Are We?
A Oyen, New York University Grossman School of Medicine, New York, NY

31 Clinical and Imaging Predictors of Need for Emergent Surgical Intervention for Small Bowel Obstruction
C Brower, University of Cincinnati Medical Center, Cincinnati, OH

32 Machine Learning Prediction of Positive Urine Cultures in an Academic Pediatric Emergency Department
T Shen, Mayo Clinic, Rochester, MN

RF7 Education

Room 3

35 Impact of Physician Assistants and Nurse Practitioners on Emergency Medicine Resident Clinical and Procedural Education
D Carlberg, Georgetown University School of Medicine, Washington, DC

36 Pediatric Code Cart Training: Can Augmented Reality Improve Pediatric Readiness for Emergency Medicine Residents
K Roszczynialski, Stanford University, Palo Alto, CA

37 Decreasing Residency Administrative Burden Through Structured Automation of Summative Evaluation Requests
L Shaker, Hackensack University Medical Center, Hackensack, NJ

508 Implementation of a Palliative Care Curriculum for Emergency Medicine Residents
T Hase, Advocate Christ Medical Center, Oak Lawn, IL

509 Improving on Shift Teaching: You Otter Know
O Otter, UNC Chapel Hill, Chapel HIll, NC

RF8 EMS

Room 4

38 Finger-to-Nose Test to Improve EMS Pre-Hospital Recognition of Posterior Stroke
T Nagy, Prisma Health Upstate, Greenville, SC

39 Assessing the Impact of Language Barriers in Prehospital Care: Interpretation Use and Pain Management in PLOE Patients
M Camacho, Denver Health Medical Center, Denver, CO

40 Characterization of Online Medical Direction Calls in the Emergency Department
T Nagy, Prisma Health Upstate, Greenville, SC

41 Evaluation of the Use of Ketamine in Prehospital Seizure Management
P Schuler, University of Missouri, Columbia, MO

42 Implementation of Whole Blood Protocol in the Prehospital Setting
N Hendley, Eastern Virginia Medical School, Norfolk, VA

43 The High Success Rate of Distal Femur Intraosseous Lines in Pediatric Patients in the Prehospital Setting
T Zitek, Mount Sinai Medical Center, Miami Beach, FL

Poster 2

Poster Hall

295 Reasons for Emergency Department Transport During Home Visits for Patients With Heart Failure in a Mobile Integrated Health Program
R Patel, Northeast Ohio Medical University, Rootstown, OH

361 Enhancing Critical Care Airway Management Quality Monitoring: Cumulative Summation Dashboard Approach
S Je, Children's Hospital of Philadelphia, Philadelphia, PA

362 AIRWAY-MR: Assessing Traditional Intubation Didactics With a Novel Mixed Reality Module
N Bhavsar, New York Presbyterian Columbia/Cornell, New York, NY

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SUNDAY, SEPTEMBER 30, 2024 —*cont'd*

364 A Novel, Human Cadaveric Airway Model for Testing of Medical Devices and Interventions: The "Breathing" Cadaver Model
J Laney, University of Texas Health San Antonio, San Antonio, TX

365 A Comprehensive, Checklist-Driven, Laryngoscopic Airway Intubation Method for the Emergency Department (ACCLAIMED) Initiative
N Fitz, North Shore University Hospital, Manhasset, NY

366 Critical Airway Closing Pressures in the Sniffing Versus the Neutral Head Position in a Novel, Human Cadaveric Airway Model
J Laney, University of Texas Health, San Antonio, TX

367 Mobile Phone Auscultation to Diagnose Chronic Obstructive Pulmonary Disease Using Pulmonary Fluid Dynamics
L Daniel, University of Louisville, Louisville, KY

368 Real World Experience Using a Rapid Test to Distinguish Bacterial From Viral Infection in the Emergency Department
C Pun, Loyola University Medical Center, Maywood, IL

370 Emergency Care Capacity Assessment of District Hospitals in Rwanda Using the WHO's Hospital Emergency Assessment Tool
K Martin, Brown University, Providence, RI

516 Ultrasound Education in EMT Courses
G Gartman, Eastern Virginia Medical School, Norfolk, Virginia

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1:30 PM

RF9 Geriatrics

Room 1

44 Delirium Screening: Prevalence and Outcomes in Older Emergency Department Patients Across a Large Healthcare System
S Meldon, Cleveland Clinic, Cleveland, OH

45 What Is the Best Method to Identify Older Patients at Risk in a Geriatric Emergency Department
A Vilke, University of California San Diego, San Diego, CA

46 A Geriatric Emergency Department Evaluation Reduces Admissions and Decreases Hospital Length of Stay
J Sit, Corewell Health East William Beaumont University Hospital, Royal Oak, MI

47 Emergency Department Intubations in Older Adults and Associated Mortality
I Maia, University of São Paulo, Brazil

48 Geriatrics Consults Can Avert Admissions in an Academic Emergency Department
K Runkel, University of Colorado, Aurora, CO

49 Exploring Current Emergency Medical Services Approaches to Manage Agitated Older Adult Patients: A Comprehensive Analysis of Statewide Protocols
J Lachs, Weill Cornell Medicine, New York NY

RF10 Health Equity

Room 2

50 Time to Provider for Patients With Non-English Language Preferences in the Emergency Department
A Rimawi, University of Michigan, Ann Arbor, MI

52 The Demographics of Duplicate Charts: Increased Prevalence in Spanish-Speaking, Hispanic, and Latino Patients
G Roda, University of Colorado Anschutz Medical Campus, Aurora, CO

53 How Well Do Emergency Department Patients Recognize Their Providers?
M Porter, Corewell Health William Beaumont University Hospital, Royal Oak, MI

54 Effect of Patient Gender on Setting Ceilings of Care: A Survey of Clinical Decisions in European Emergency Physicians
A Vromant, APHP - La Pitie Salpetriere, Paris, France

RF11 Health Policy

Room 3

55 The Effect of Federal Policy Changes on Buprenorphine Prescribing in Massachusetts
J Hayes, Mass General Brigham, Boston, MA

56 Impact of 2023 Centers for Medicare and Medicaid Services Guidelines on Point-of-Care Emergency Ultrasound Billing
E Cen, Columbia University Irving Medical Center, New York, NY

57 Risk Adjustment and the Emergency Department: Who Are Our Frequent Utilizers?
S Wu, Northwestern University Feinberg School of Medicine, Chicago, IL

58 Variation in the Rate of EMTALA Investigations and Resulting Citations
S Ahmed, Keck School of Medicine of the University of Southern California, Los Angeles, CA

59 Comparative Analysis of Emergency Department Utilization Patterns During the COVID-19 International Pandemic: Frequent Users vs General Population
D Shih, Henry Ford Hospital, Detroit, MI

RF12 Infectious Disease

Room 4

60 Introduction of Urinalysis With Reflex Culture Orders and Association With Screening, Diagnosis, and Treatment Practices for Urinary Tract Infections in the Emergency Department
A Tai, Cleveland Clinic, Cleveland, OH

61 Paxlovid Efficacy in Unvaccinated COVID-19 Patients: A Comprehensive Review of Outcomes
D Jehle, The University of Texas Medical Branch at Galveston, Galveston, TX

62 Single Dose Aminoglycosides for Acute Uncomplicated Cystitis in the Emergency Department Setting
J Dombroski, St. Elizabeth Boardman, Youngstown, OH

64 Incidence of Concomitant Bacterial Infection in Hospitalized Patients With a Positive Viral Respiratory Panel
M Stesney, Des Moines University, West Des Moines, IA

65 Pharmacist-Based Treatment of Hepatitis C Virus Infection in the Emergency Department Improves Treatment Uptake Rates and Time to Treatment
J Moore, University of Kentucky, Lexington, KY

Poster 3

Poster Hall

371 Gender Representation Among Faculty Speakers at National Emergency Medicine Conferences
A Rider, Stanford University, Palo Alto, CA

372 The Leaky Gender Pipeline in Emergency Medicine Residency Programs From 2011 to 2022
B Badloo, New York Medical College, Valhalla, NY

SUNDAY, SEPTEMBER 29, 2024 —*cont'd*

373 Sex Disparities in Extracorporeal Membrane Oxygenation Clinical Trial Enrollment
N Schmalbach, Cooper Medical School of Rowan University, Camden, NJ

375 Striving for Equity in the Emergency Department: An Analysis of Race and Ethnicity Trends in Emergency Department Residencies From 2012-2022
M Vasquez, New York Medical College, Valhalla, NY

376 Trauma-Informed Pelvic Examinations: Positive Impact of Educational Session on Emergency Medicine Learners
E Dowling, Creighton University/Valleywise Health, Phoenix, AZ

377 The New York ACEP Opportunities for Women in Leadership Program: Best Practices and Key Lessons Learned
M Butt, Maimonides Health, Brooklyn, NY

378 Voicing the Needs of Vulnerable Women Through Their Lived Experiences: An Emergency Department Qualitative Study
A Ruch, NGHS, Flowery Branch, GA

379 Sex Differences in Testing for Pulmonary Embolism in Emergency Department Patients by Chief Complaint
M Roderick, UC Davis, Sacramento, CA

517 Implementing a Legal Medicine Curriculum Into Resident Didactics
M Pajdak, Newark Beth Israel Medical Center, Newark, NJ

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2:30 PM

RF13 Informatics & AI

Room 1

66 Post-Shift Electronic Health Record Work Is Associated With Decreased Personal Accomplishment
E Kim, Columbia University Irving Medical Center, New York, NY

67 EMERGENT: Emergency Medicine Resources and Guidelines Enhanced by Natural Language Text-Generation
D Dash, Stanford University, Palo Alto, CA

68 Leveraging Probability Theory and Machine Learning to Reduce Diagnostic Uncertainty
A Coleska, Massachusetts General Hospital, Boston, MA

69 A Comprehensive Catalog of Emergency Medicine Applications of FDA-Regulated Artificial Intelligence-Enabled Products
J Morey, Mayo Clinic, Rochester, MN

70 Automated CT Prioritization in the Emergency Department
S Dutta, Massachusetts General Hospital, Boston, MA

71 Examining Outliers: Using Advanced Informatics to Inform Novel Process Improvement
H Ijaz, Weill Cornell Medicine, New York, NY

RF14 Injury & Trauma

Room 2

73 Subclinical, Long-Term Psychological Symptoms Following Sport-Related Concussion: Are Athletes More Depressed Than We Think?
C Burns, Meharry Medical College, Nashville, TN

74 Extreme Environmental Temperatures and Heat Stroke Presentations in Phoenix, Arizona
M McElhinny, Valleywise Health, Phoenix, AZ

75 Factors Associated With Disposition Among Patients With Burn-Related Injuries Presenting to the Emergency Department From 2016 - 2023
M Larkins, Wright State University, Dayton, OH

76 Implementation of the New Acts on Driving Under Influence of Alcohol and Clinical Outcomes for Severe Injured Patients From Road Traffic Injury
E Jung, Chonnam National University Hospital, Gwangju, Republic of Korea

RF15 Neurology Diagnostics

Room 3

77 Impact of Sex and Age on Various Brain Biomarkers Serum Levels Following a Mild Traumatic Brain Injury: A Prospective Cohort Study
F Desmeules, Université Laval, Québec, Canada

78 Glial Fibrillary Acidic Protein and Ubiquitin C-Terminal Hydrolase-L1 as Potential Blood Biomarkers for Intracranial Hemorrhage in Mild Traumatic Brain Injury
G Spaziani, Fondazione Policlinico Universitario Agostino Gemelli IRCCS - Università Cattolica del Sacro Cuore, Rome, Italy

79 Subarachnoid Hemorrhage in the Emergency Department (SHED): A United Kingdom Prospective Observational Multicenter Cohort Study of the Diagnostic Test Characteristics of CT Brain for Subarachnoid Haemorrhage
T Roberts, University of Bristol, United Kingdom

80 Sensitivity of a 5-Element Cortical Sign Screen for Detecting Acute Basilar Artery Occlusion Stroke
C Agbonghae, Carolinas Medical Center, Charlotte, NC

81 Dendrimer Nanoparticles Allow for Targeted Localization in a Mouse Model of Intracerebral Hemorrhage: A Vehicle for Treating Secondary Injury
A Shi, Massachusetts General Hospital / Harvard Medical School, Boston, MA

82 Clinical Performance of Glial Fibrillary Acidic Protein and Ubiquitin C-Terminal Hydrolase L1 for Prediction of Intracranial Injuries on Head Computed Tomography in Mild Traumatic Brain Injury
S Datwyler, Abbott Laboratories, Abbott Park, IL

RF16 Pain Management

Room 4

83 Sphenopalatine Ganglion Nerve Blocks for the Management of Acute Migraine Exacerbations
A Shah, NYU Bellevue, Manhattan, NY

84 A Year of Laughing Gas in the Emergency Department: A Wide Range of Indications for Nitrous Oxide
C Ghassemi, St. Joseph's University Medical Center, Paterson, NJ

85 Development of an Innovative Erector Spinae Plane Nerve Block Ultrasound Model to Facilitate Training for Emergency Physicians
P Moschella, Prisma Health-Upstate, Greenville, SC

86 Use of Low-Cost Virtual Reality for Distraction and Anxiolysis During Painful Procedures
F Ibu, University of Missouri, Columbia, MO

87 The Impact of Dental Blocks on Emergency Department Revisits: A National Study of Emergency Department Patients With Dental Pain
A Kantrales, HCA Florida Orange Park Hospital, Orange Park, FL

88 Persistent Opioids Use Among Patients Presenting to the Emergency Department for Pain
F Pacheco, Montefiore Medical Center, Bronx, NY

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Poster 4

Poster Hall

380 Rate of Comorbidities and Social Determinants of Health Barriers Among Emergency Department Patients With HIV
K Faryar, University Hospitals Cleveland Medical Center, Cleveland, OH

381 Anticoagulant Drug Use Is Associated With Increased Short-Term Bounceback Sepsis Admission
A Chen, University of California, San Diego, San Diego, CA

382 Testing in Urgent Care Patients With Respiratory Infections: Data From a Randomized Trial
R Childers, University of California San Diego Health, San Diego, CA

383 Five-Year Differences in STI Screenings and Prevalence in a Southern Healthcare System
F Uddin, Prisma Health Upstate, Greenville, SC

384 Predictive Factors in Emergency Department-Based HIV Testing Refusal
S Chen, Loyola University Stritch School of Medicine, Maywood, IL

386 An Innovative Hearing AED Alarm System Can Decrease Automated External Defibrillator Delivery Time: A Randomized Controlled Simulation Study
C Lin, China Medical University, Taiwan

387 Does an Assess and Refer Protocol Initiated by EMS to Combat Emergency Department Crowding Adversely Affect Patient Care?
D Campagne, UCSF, Fresno, CA

388EMF Emergency Medical Services Risk Factors for Stroke in Type A Aortic Dissection
E Larson, Johns Hopkins School of Medicine, Baltimore, MD

389 Pre-Hospital Naloxone Use Patterns and Patient Outcomes: A National Observational Study
M Wegman, ACEP, Irving, TX

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3:30 PM

RF17 EMF Showcase

Room 1

89EMF The Utility of High Dose Buprenorphine in Producing Prolonged Suppression of Opioid Withdrawal
R McCormack, NYU School of Medicine & Bellevue Hospital Center, New York, NY

90EMF High Rates of Asymptomatic Sexually Transmitted Infections Detected Through Confidential Self-Testing in the Emergency Department
K Stanford, University of Chicago, Chicago, IL

91EMF Interventions to Reduce Emergency Department Admissions for High-Variation Conditions Under an Alternative Payment Model
J Oskvarek, Summa Health System, Akron, OH

92EMF Improving Procedural Safety, Efficacy, and Patient Outcomes for Ultrasound Guided Nerve Blocks in the Emergency Department via Objective Competency Measures
C Walsh, Massachusetts General Hospital and the Brigham and Women's Hospital, Boston, MA

93EMF The Association of Emergency Medical Services Agency- and Clinician-Level Factors With Adherence to Evidence-Based Guidelines for the Prehospital Management of Traumatic Brain Injury
S Goldberg, Brigham and Women's Hospital, Boston, MA

RF18 Pediatrics

Room 2

94 Effect of Emergency Department Prompt on Improving Provider Documentation of Repeat Vital Signs in Children Presenting With Fever and Tachycardia
P Haskins, Mount Sinai, Medical Center, New York, NY

95 Characteristics and Length of Stay in Children With Bronchiolitis With and Without Intravenous Hydration
L Fisher, University of Arkansas for Medical Sciences, Little Rock, AR

96 Pediatric Nasal Foreign Body Not Visible on Simple Exam: Incidence and Patient Characteristics
J Thompson, University of Michigan, Ann Arbor, MI

97 Trends Within Pediatric Traumas and Social Determinants of Health: A GIS Study
N Bennett, Medical College of Georgia, Augusta, GA

RF19 Public Health

Room 3

98 Three Pilot Randomized Controlled Trials Evaluating a Persuasive Health Communication Intervention for Adult Emergency Department Patients Declining HIV/HCV Testing
R Merchant, Icahn School of Medicine at Mount Sinai, New York, NY

99 Opioid Use Among Construction Workers: A Systematic Review of Risk Factors
H Siddiqui, University of Toronto, Toronto, Ontario, Canada

100 Autologous Fat Transfer Procedure Complications in the Emergency Department: A Public Health Crisis
M Lee, Jackson Memorial Hospital, Miami, FL

101 Evaluation of Missed Opportunities Prior to HIV Diagnosis in a Large Southeastern Level 1 Trauma Center
D Hudon, Prisma Health Midlands, Columbia, SC

102 Leveraging Big Data in ACEP's Emergency Medicine Data Institute Registry to Measure Syphilis and Sexually Transmitted Infection Co-Testing Rates Among Emergency Department Patients With Pregnancy Testing
D Sharma, ACEP, Irving, TX

103 Underserved Emergency Department Populations at Risk for Negative SARS-CoV-2 Vaccination Status and an Intervention to Improve Utilization
A Keane, University of South Carolina School of Medicine, Greenville, SC

RF20 Quality / Safety

Room 4

104 Implementation of an Emergency Department Quality Improvement Program to Improve Care for Emergency Department Patients With Opioid Use Disorder at Four Southwest Michigan Hospitals
S Nekkanti, WMed, Kalamazoo, MI

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105 Comparing Imaging Rates for Work-Related and Non-Work-Related Injuries in the Emergency Department
M Baskey, Dalhousie University, Halifax, Novia Scotia, Canada

106 Emergency Physician Quality Improvement Metric Increases Utilization of Medication for Opioid Use Disorder
A LaPietra, RWJBarnabas, West Orange, NJ

107 Frequency of Aspirin Re-Evaluation After a Bleeding-Related Emergency Department Visit: A Pilot Study
K Musgrow, University of North Carolina School of Medicine, Chapel Hill, NC

108 Improving Emergency Department CT Turnaround Times in a Large, Urban, Academic Medical Center
J Smileye, University of Pennsylvania Hospital, Philadelphia, PA

513 Left-handed Central Line: The Right Way Is Not Always Right
J Jozefick, Tower Health Drexel West Reading Campus

Poster 5

Poster Hall

390 Adaptation of the Foundations of Emergency Medicine Electrocardiogram Curriculum
A Pawlukiewicz, Carl R. Darnall Army Medical Center, Fort Cavazos, TX

391 Soft Embalmed Cadavers as a Novel Approach to Arthrocentesis Education
J Bethencourt, University of Florida, Gainesville, FL

392 Enhancement of Medical Education in Point-of-Care Ultrasound Using Additive Manufacturing
B Brizuela, David Geffen School of Medicine at UCLA, Los Angeles, CA

393 How Many Central Venous Lines Do Supervising Physicians Believe Resident Trainees Require to Be Competent?
S Brown, Vanderbilt University Medical Center, Nashville, TN

394 Research Associate Programs to Supporting Residency Scholars: How They Are Funded
C Vasquez, Trinity Health, Livonia Hospital, Livonia, MI

395 Social Media Trends by Program Type and Region in Emergency Medicine Residencies
L McCafferty, University Hospitals Cleveland Medical Center, Cleveland, OH

396 Behavior Cuing in Student Assessments Improves Feedback Concordance
I Hsu, University of Michigan, Ann Arbor, MI

397 Novel Model for Forearm Nerve Blocks Incorporating 3D Printing Technology
G Reynolds, Thomas Jefferson University Hospital, Philadelphia, PA

398 Deployment of an Automated Resident Procedure Logging System Is Not Associated With Changes in Rates of Off-site Procedure Logging
B Kwan, University of California San Diego School of Medicine, San Diego, CA

399 What Do Emergency Medicine Residents and Attending Physicians Think of the ACGME Milestones?
F Fiesseler, Morristown Medical Center, Morristown, NJ

MONDAY, SEPTEMBER 30, 2024

8:00 AM

Research Forum Exhibit Hall

RF21 Resuscitation

Room 1

109 Association Between Naloxone and Patient Outcomes in Out-of-Hospital Cardiac Arrests in California
D Dillon, University of California Davis, Sacramento, CA

110 Resuscitation Videography for Innovation in the Emergency Department (REVIVED): A Multi-Center Collaborative to Study Emergency Department Cardiac Arrests Using Video Review
R Ramraj, Northwell Health, Manhasset, NY

111 Impact of Pharmacist Preparation of Four-Factor Prothrombin Complex Concentrate at the Bedside in Patients With Life-Threatening Hemorrhage in the Emergency Department
C Woster, Regions Hospital, St. Paul, MN

112 High Altitude Pulmonary Edema Response to Continuous Airway Positive Pressure: The HAPER CAPER Trial
S Dahal, St Elizabeth Boardman Hospital, Youngstown, OH

113 Adverse Events During Emergency Intubations in Neurocritical Patients
I Maia, University of São Paulo, Brazil

284 Failure Rate of D-Dimer Testing in Patients With a High Clinical Probability of Pulmonary Embolism: An Ancillary Analysis of Three European Prospective Cohorts
H Bannelier, APHP Pitié Salpêtrière, Paris, France

RF22 Simulation

Room 2

114 Comparing Standard vs Modified Placement Techniques of a Gastroesophageal Balloon Tamponade Device During Simulated Massive Upper Gastrointestinal Hemorrhage
T Hase, Advocate Christ Medical Center, Oak Lawn, IL

115 Pediatric Emergency Department In-Situ Simulation Program
M Schmidt, University of New Mexico, Albuquerque, NM

116 Emergency Medicine Resident Attitudes Surrounding Resuscitation of a Critically Ill Child: Overcoming Obstacles Using a Novel Form of Simulation
C Theiler, University of Iowa Carver College of Medicine, Iowa City, IA

117 Evaluating the Accuracy and Provider Wellness Impact of an Ambient Artificial Intelligence Scribe in a Complex Simulated Emergency Department Environment
R Hata, Indiana University School of Medicine, Indianapolis, IN

118 Broselow Color-Coded Crash Cart vs Standard Crash Cart in Simulated Pediatric Resuscitation
A Bakhsh, King Abdulaziz University, Jeddah, Saudi Arabia

RF23 Social & Behavioral Health

Room 3

119 Exploring the Relationship Between Patient- and Neighborhood-Level Factors and Caregiver-Reported Unmet Social Needs and Interest in Community Resource Referral During Pediatric Emergency Department Visits
R Thorpe, University of Utah, Salt Lake City, UT

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

MONDAY, SEPTEMBER 30, 2024 —*cont'd*

120 Social Needs Screening in Emergency Medicine: Utilizing an Abridged PRAPARE Screening Tool
M Yuan, Washington University School of Medicine, St. Louis, MO

121 Enriching Patient Care in Downstate and Kings County Emergency Departments
A Singh, AUC School of Medicine, Sint Maarten, Netherlands

122 Implicit Bias in the Patient Descriptor "Homeless," and its Association With Emergency Department Opioid Administration and Disposition
R Nene, University of California San Diego, San Diego, CA

123 Civil Monetary Penalties Related to Violations of the Emergency Medical Treatment and Labor Act Involving Psychiatric Emergencies: A 5-Year Update
Z Reichert, Keck School of Medicine of the University of Southern California, Los Angeles, CA

124 External Validation of Shah's Score for Emergency Department Patients Presenting With Psychiatric Chief Complaints
H Mesbah, Baylor College of Medicine, Houston, TX

RF24 Substance Abuse Disorder

Room 4

125 Buprenorphine or Methadone: A Qualitative Analysis of Patient Preference in an Urban Emergency Department
C Hazekamp, Lincoln Medical Center, Bronx NY

126 Reasons for Declining Buprenorphine Induction Among Persons With Opioid Use Disorder Presenting to the Emergency Department
K Scarpino, Medical University of South Carolina, Charleston, SC

127 Medications for Alcohol Use Disorder and Withdrawal: A National Sample of Patients Discharged From the Emergency Department
K Hawk, Yale University, New Haven, CT

128 Emergency Department Initiation of Buprenorphine/Naloxone to Reduce Opioid Overdose and Death
S Matts, Case Western Reserve University School of Medicine, Cleveland, OH

129 Methamphetamine Use and Engagement With Medications for Opioid Use Disorder
M Parrish, UNLV Kirk Kerkorian School of Medicine, Las Vegas, NV

130 Incentivizing Substance Use Disorder Treatment in Emergency Departments: A Competition-Based Approach Harnessing Electronic Health Record Data
G Shaheed, Harbor-UCLA Medical Center, Torrance, CA

Poster 6

Poster Hall

400 Comparison of Characteristics of Pediatric Behavioral Health Emergency Department Visits, Transfers, and Admissions in California Before and During the COVID-19 Pandemic (2017-2021)
H Vongsachang, UCLA, National Clinician Scholars Program, Los Angeles, CA

401 Emergency Department Outcomes Associated With Police-Involved Transport: A Propensity-Matched Cohort Study
A Heffron, Icahn School of Medicine at Mount Sinai, New York, NY

402[EMF] Defining Diagnostic Excellence for the Emergency Department Setting: Results From a Literature Review and Expert Panel Discussion
C Berdahl, Cedars-Sinai Medical Center, Los Angeles, CA

403[EMF] Barriers and Facilitators to Addiction Treatment Access From the Emergency Department Among Black Individuals With Opioid Use Disorder
E Coupet Jr., Yale, New Haven, CT

404 Emergency Medical Treatment and Labor Act (EMTALA) Citations Involving On-Call Obstetric and Gynecologic Responsibilities, 2011-2023
O Sison, Keck School of Medicine of the University of Southern California, Los Angeles, CA

405 Emergency Surgery Following a Return Visit to the Emergency Department: An Analysis of 454,330 Emergency Department Visits
C Tsai, National Taiwan University Hospital, Taipei, Taiwan

407 The Effect of Naloxone Administration on the Treat and Release Length of Stays in Emergency Department Patients With Suspected Opioid Overdoses
S Gupta, Zucker School of Medicine, Bay Shore, NY

408 Evaluating the Impact of the Stroke Stop Protocol on Time to CT for Stroke Patients in a University Hospital Emergency Department
C Bury, Duke University School of Medicine, Durham, NC

409 The Impact of Level Loading in a Large Academic Medical System
M Dilip, Yale University, New Haven, CT

MONDAY, SEPTEMBER 30, 2024

11:00 AM

RF25 Plenary 2

Room 1

131 Pulmonary Embolism Severity Index vs Point-of-Care Ultrasound in Predicting Adverse Outcomes
P Antoon, Wellspan York Hospital, York, PA

132 Erector Spinae Block Used for Patients With Renal Colic in the Emergency Department: A Randomized Clinical Trial
M Secko, Stony Brook University Hospital, Renaissance School of Medicine, Stony Brook, NY

133 Rising VExUS Score After Small Volume Fluid Resuscitation Is Associated With Worse Outcomes in Septic Emergency Department Patients
A Dalpiaz, North Shore University Hospital, Manhasset, NY

134 Emergency Department Admitting Service Triage Using Retrieval-Augmented Language Models
D Yao, Stanford University, Stanford, CA

135 Improving Crowding and Patient Satisfaction in the Emergency Department Through Early Discharge Lounge Operation
C Park, Yonsei University Severance Hospital, Seoul, Republic of Korea

RF26 Telemedicine

Room 2

136 Creating a Virtual Extension of the Academic Medical Center Through TelEmergency and Layered, Acute Service Consultations
S Sterling, University of Mississippi Medical Center, Jackson, MS

137 Pediatric Telemedicine Care Is Associated With Minimal Increases in Subsequent Emergency Department Visits
S Casey, Kaiser Permanente, Vallejo, CA

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

MONDAY, SEPTEMBER 30, 2024 —*cont'd*

138 The Efficacy of TeleTriage: Does It Matter Who Performs It?
A Roggio, University of Maryland School of Medicine, Baltimore, MD

139[EMF] Assessing Efficacy and Value of Tele-Emergency Care Within the Veterans Health Administration
K Li, University of Washington, Seattle, WA

140 Enhancing Emergency Department Psychiatric Patient Care Through Telehealth: A Two-Site Pilot Study
J Oskvarek, Summa Health System, Akron, OH

141 Patient Portal Usage Characteristics in a Pediatric Emergency Department
C Chen, NYU Grossman School of Medicine, New York, NY

RF27 Trauma

Room 3

142 Derivation and Validation of a Clinical Risk Score to Predict Need for Intensive Care Unit Utilization After Initial Emergency Department Evaluation of Patients With Acute Traumatic Injuries
M Makutonin, Yale University, New Haven, CT

143 Predictors of Cardiac Injury in Blunt Trauma: A Contemporary Analysis
C Lee, St Louis University Hospital, St Louis, MO

144 Outcomes From an Emergency Department Observation Program for Mild Traumatic Brain Injuries
N Huth, Eastern Virginia Medical School, Norfolk, VA

145 In Plain Sight: Evaluating the Pubic Symphysis on Standard FAST Views
S Irving, University of Iowa Hospitals and Clinics, Iowa City, IA

146 Safety and Effectiveness of a Kaolin-Impregnated Hemostatic Device in Anticoagulated Patients: Real-World and Controlled Trial Outcomes
C Ryan, Teleflex Medical, Athlone, Ireland

147 Development of an Ultrasound Algorithm Enabled Handheld Automated Needle Decompression Device (ANeeD) for Pneumothorax Decompression in a Live Swine Model
Z Soucy, Dartmouth Hitchcock Medical Center, Lebanon, NH

RF28 Ultrasound

Room 4

148 Abnormal Lung Ultrasound Features Are Highly Prevalent in Smoke Inhalation Patients
B Hicks, Oregon Health and Sciences University, Portland, OR

149 Artificial Intelligence Model to Identify the Common Femoral Artery for Guiding Advanced Endovascular Procedures
R Mukaddim, Philips North America, Cambridge, MA

150 ULTRA-EYE: Automated Ultrasound Technology for Retinal Detachment Assessment
S Adhikari, University of Arizona, Tucson, AZ

151 Point-of-Care Ultrasound Outcomes and Integration for Sepsis in the Emergency Department
S Mishra, Prisma Health - Upstate, Greenville, SC

152 Accuracy of Point-of-Care Ultrasound in Detecting Retained Products of Conception
T Fetherston, Yale University, New Haven, CT

153 POCUS Mastery: A Holistic Approach to Ultrasound Proficiency Assessment
G Schumaker, Southwest Medical Education Consortium, Temecula, CA

Poster 7

Poster Hall

369 Adaptivity and (In)equity in a Crisis: Health System Resource Allocation During the COVID-19 Response in African Emergency Care
S McCuskee, Icahn School of Medicine at Mount Sinai, New York, NY

410 Physician Modifiers Associated With the Evaluation of Suspected Child Physical Abuse in the Pediatric Emergency Department
A Sepulveda, Nemours Children's Health, Orlando, FL

411[EMF] Dose-Finding Study of Intranasal Midazolam for Procedural Sedation in Children
D Tsze, Columbia University Irving Medical Center, New York, NY

412[EMF] Enrolling Pediatric Asthma Patients for an Environmental Precision Medicine Research: A Feasibility Study
N Menze, University of Florida College of Medicine, Jacksonville, FL

413 Can Caregivers Reliably Assess Their Child's Heart Rate and Respiration Rate Using Smartphone or Smartwatch Applications?
M Yasuda, Virginia Commonwealth University Medical Center, Richmond, VA

414 Comparison of Emergency Department Management and Disposition Among Adolescents and Young Adults 12-25 Seen for Mental Health Presentations
N Ibrahim, Brown University School of Public Health, Providence, RI

415 Use of a Modified Pediatric Early Warning Score to Address Under-Triage of Pediatric Patients in a Mixed-Population Emergency Department
R Romero, University of Michigan Health West, Wyoming, MI

416 Providing Screening and Linkage to HIV Preventive Services for At-Risk 13–17-year-olds in a Pediatric Emergency Department: A Two-Year Program Update
L Kearl, Keck School of Medicine of the University of Southern California, Los Angeles, CA

417 Despite Their Concerns, Residents Have a Poor Understanding of ACGME Duty Hours Rules
F Fiesseler, Morristown Medical Center, Morristown, NJ

468 Current Stance on Focused Cardiac Ultrasound (FOCUS) for Suspected Aortic Dissection by Physicians in Mid-Atlantic Emergency Departments
M Lynberg, Georgetown University School of Medicine, Washington, DC

MONDAY, SEPTEMBER 30, 2024

12:00 PM

RF29 Wellnes

Room 1

154 Effects of a "Casino Night Schedule" on Emergency Physician Wellness
P Nathan, University of Missouri, Columbia, MO

155 A Case Study of How Alleviating "Pebbles in the Shoe" Can Improve Workflow Operations in the Emergency Department
D Savitzky, NYU Grossman Long Island School of Medicine, Mineola NY

MONDAY, SEPTEMBER 30, 2024 —*cont'd*

156 Recognition Matters: Increasing Community and Wellbeing Through a Faculty Development Committee
C Freiermuth, University of Cincinnati, Cincinnati, OH

157 Transitions: A Financial Wellness Education Pilot Curriculum for Emergency Medicine Residents
S McCormick, Wayne State University, Detroit, MI

158 Burnout Among Physician Assistants Practicing in Emergency Medicine: A National Cross-Sectional Analysis
F Wu, UCSF, Fresno, CA

RF30 Administration & Operations

Room 2

159 A Multidisciplinary Discharge Huddle Improves Emergency Department and Hospital Throughput Measures Without Increased Readmissions in a Rural Emergency Department
J Rittenberger, Guthrie Robert Packer Hospital, Sayre, PA

160 Breath Actuated Nebulizers for Asthma and COPD: A Monte Carlo Simulation Illustrating Cost Savings and Length of Stay Reduction in the Emergency Department
A Luo, Brigham & Women's Hospital, Boston, MA

161 Use of Wearable Data to Predict Emergency Department Revisits
G Wardi, University of California San Diego, San Diego, CA

162 Is There an Association Between Emergency Department Crowding and Emergency Medical Services Redirection?
M Mohan, Northwell, New York, NY

163 Track That Emergency Department Consult! Implementation and Validation of an Emergency Department Consult Tracking Tool to Monitor Consult Turnaround Times
T Layng, University of Virginia, Charlottesville, VA

512 Critical Care Documentation Basics: An Educational Initiative to Support Quality Improvement
N Salman, Prisma Health, Greenville SC

RF31 Airway

Room 3

164 An Analysis of Different Specialists Performing Intubation in the Emergency Department
I Maia, University of São Paulo, Brazil

165 Ketamine vs. Etomidate in Emergency Department Intubations: The Search for a Hemodynamically Neutral Agent
I Maia, University of São Paulo, Brazil

166 Association of a Strategy of Supraglottic Airway Insertion vs Endotracheal Intubation With One-Month Survival in Traumatic Out-of-Hospital Cardiac Arrest
T Fukuda, Kyoto Kujo Hospital, Kyoto, Japan

167 Patient Monitor Position and Operator Utilization During Endotracheal Intubation
E Boccio, Memorial Healthcare System, Pembroke Pines, FL

168 Evaluating AI-Powered Point-of-Care-Ultrasound Training for Estimating Gastric Volume for Pre-Intubation Assessment
N Wallace, University of Tucson, University Medical Center, Tucson, AZ

169 Assessing Shock Index Variants as Predictors of Peri-Intubation Circulatory Collapse
I Maia, University of São Paulo, Brazil

RF32 Cardiovascular

Room 4

170 Interpretable Machine Learning to Enhance the HEART Score in Predicting Major Adverse Cardiac Events in Patients With Chest Pain in the Emergency Department
C Yau, National University of Singapore, Yong Loo Lin School of Medicine, Singapore

171 Cardiovascular Risks Associated With Cannabis Use in Emergency Department Patients
K Paul, University of Texas Medical Branch, Galveston, TX

172 A Prospective Trial of the Effect of Canadian Syncope Risk Score Recommendations on Emergency Physician Management of Unexplained Syncope
L Farshidpour, University of California San Francisco, Fresno, CA

173 Radiation-Reducing Strategies in Antenatal Pulmonary Embolism Diagnostics: Differences in Testing Efficiency and Specialty-Specific Use Patterns
C Middleton, UC Davis Health, Sacramento, CA

174 Comparison of Large-Bore Mechanical Thrombectomy to Other Therapies for High-Risk Pulmonary Embolism Using Propensity-Score Matched Analysis of the FLAME Study
T Cummings, Emergency Care Specialists @ Corewell Health West, Grand Rapids, MI

175 Cost-Effectiveness of Early Non-Invasive Cardiac Testing for Suspected Acute Coronary Syndrome
B Sun, Leonard Davis Institute of Health Economics, University of Pennsylvania, Philadelphia, PA

Poster 8

Poster Hall

419 Determinants of Opioid Overdose Risk in the COVID-19 Era
S Shastry, Icahn School of Medicine at Mount Sinai, New York, NY

420 Practicing Clinician Ability in Estimating Patient Weight Using Visual Cues
H Tyczkowski, Rocky Vista University College of Osteopathic Medicine, Englewood, CO

421 Unseen Flames in the Emergency Department: Patterns of Burn Injuries Resulting From Suspected Abuse
K Chu, R Adams Cowley Shock Trauma Center, Baltimore, MD

422 Lock-Downs Causing Lock-Ins: The Impact of the COVID Pandemic on Domestic and Intimate Partner Violence Trends Observed by Forensic Nurse Examiners
R Kennedy, University of Colorado School of Medicine, Aurora, CO

424 Emergency Department Visits for Pickleball Injuries From 2017-2022
M Hannon, UNLV Kirk Kerkorian School of Medicine, Las Vegas, NV

425 Predictors of High-Risk Opioid Prescribing in the Emergency Department at an Academic Medical Center
A Allen, Loyola University Chicago Stritch School of Medicine, Maywood, IL

426 Missed Diagnosis of Mild Traumatic Brain Injury: Retrospective Study in an Urban Emergency Department
J Pettengill, Jefferson Health, Philadelphia, PA

427 Comparison of High and Low Dose Ketorolac With Placebo for Treatment of Pain in the Emergency Department: A Randomized Controlled Clinical Trial
N Kuyper, University of Missouri Hospital, Columbia, MO

MONDAY, SEPTEMBER 30, 2024 —*cont'd*

428 Self-Reported Readiness to Change Alcohol Use in Emergency Department Patients With Alcohol Use Disorder Predicts Successful Linkage to Treatment
K Hawk, Yale University, New Haven, CT

MONDAY, SEPTEMBER 30, 2024

1:00 PM

RF33 Education

Room 1

176 Effect of In-Person vs Virtual Interviews on Residency Interview Scores
S Cox, HealthPartners Institute/Regions Hospital, St. Paul, MN

177 Assessing the Effectiveness and Satisfaction of Teaching Huddles Among Emergency Medicine Residents
M Cheaito, University of Toledo, Toledo, OH

178 A Pilot Program: Understanding of Social Determinants of Health Following Ride-Along With Mobile Integrated Healthcare Program
D Nguyen, University of South Carolina School of Medicine, Greenville, SC

179 Building a Ready Central Valley: Teaching Life-saving Skills and Increasing Awareness Around First Responder and Medical Careers in High School Students From Underserved Communities
J Cruz, UCSF School of Medicine, San Francisco, CA

180 AI-Enhanced Spaced Repetition in Emergency Medicine Education
B Tarzia, Cooper University Hospital, Camden, NJ

511 Infectious Disease Podcasts for Users of the CMES Program
E Cloessner, Washington University in Saint Louis, St. Louis, MO

RF34 EMS

Room 2

181 Pre-Hospital Management of Heatstroke During a Heatwave in Phoenix, Arizona
P Pugsley, Valleywise Health, Phoenix, AZ

182 Interfacility Transport by Private Vehicle Between Hospitals in a Rural Area Was Not Associated With Adverse Patient Outcomes
E Day, Drexel University College of Medicine, Philadelphia, PA

183 Potential Impact of Direct to Waiting Room Triage on Ambulance Offload Delay
A Rolle, University of California San Diego, San Diego CA

184 Impact of Targeted Naloxone Distribution on Bystander Administration Prior to New Orleans EMS Calls
G Yang, Tulane University School of Medicine, New Orleans, LA

185 An Emergency Medical Services to Emergency Department Checklist for Handoff of Cardiac Arrest: A Modified Delphi Approach
M Shameem, Northwell Health, Manhasset, NY

186 Emergency Medical Service Clinicians' Perceptions and Utilization of Resources for People Experiencing Homelessness
A Ly, Keck School of Medicine of the University of Southern California, Los Angeles, CA

RF35 Geriatrics

Room 3

187 The Impact of Geriatric Consultation on Admission Rates of Older ACO Patients From the Emergency Department: Implications for ACO Cost Savings
S Meldon, Cleveland Clinic, Cleveland, OH

188 Temporal Impact of Hospice and Palliative Medicine Consults on End-of-Life Outcomes in Emergency Department and Hospitalized Patients
P Draper, Henry Ford Health, Wyandotte, MI

189 Initiation of Early Palliative Care and Hospice From the Emergency Department
P Draper, NYU Langone Health, New York, NY

190 ISAR Screening: Implications for Older Patients Seen in the Emergency Department for Fall and Injuries
A Davis, University of California San Diego, San Diego, CA

191 Laboratory Testing May Benefit Older but Not Younger Emergency Department Psychiatric Patients
B Eskin, Morristown Medical Center, Morristown, NJ

192 Sex-Specific Differences in Emergency Department Patient Mortality Predictors and Documentation of End-of-Life Goals of Treatment
A Masullo, Lehigh Valley Hospital and Health Network/ USF Morsani College of Medicine, Allentown, PA

RF36 Health Equity

Room 4

51 Improving Resident Racial and Ethnic Diversity
J Wahba, Harbor-UCLA Medical Center, Torrance, CA

193 Socio-Demographic Disparities in Emergency Department Wait Times
K Stillman, Cedars-Sinai Medical Center, Los Angeles, CA

194[EMF] Neighborhood Social Vulnerability and Access to Expedited Partner Therapy Prescriptions: A Secret Shopper Audit Survey
R Solnick, Mount Sinai Hospital, New York, NY

195 Language Access in the Emergency Department: The Patient's Perspective
J Torres, David Geffen School of Medicine at UCLA, Los Angeles, CA

196 COVID-19 Pandemic-Related Racial/Ethnic Disparities in Emergency Department Visits for Patients With Childhood Asthma in the United States
A Alexander, Brooklyn Hospital Center, Brooklyn, NY

197 Disparities in Psychiatric Admissions From the Emergency Department
A Jourdan, UCLA Ronald Reagan Medical Center, Los Angeles, CA

Poster 9

Poster Hall

429 Implementation of Patient Blood Management Program Improves Blood Product Utilization in the Emergency Department
E Boccio, Memorial Healthcare System, Pembroke Pines, FL

430 Decreasing Time to Initial Pain Intervention in the Pediatric Emergency Department
J Korn, Virginia Commonwealth University, Children's Hospital, Richmond, VA

431 Text Me Maybe: Using Text Messages to Improve Patient Experience in the Emergency Department
M Barshay, Brown University, The Warren Alpert Medical School, Providence, RI

432 Pneumococcal Urinary Antigen Testing in Community Acquired Pneumonia: A Missed Opportunity for Early Antibiotic De-escalation or a Low-Value Test?
T Gautier, Cleveland Clinic Lerner College of Medicine, Cleveland, OH

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

MONDAY, SEPTEMBER 30, 2024 —*cont'd*

433 Continuous Quality Improvement for Prehospital STEMI Results in Shorter Door to Balloon Times and Optimized Triage Rates
L Ganti, Polk County Fire Rescue, Bartow, FL

434 The Safety and Efficacy of Intranasal Fentanyl and Midazolam for Pediatric Anxiolysis
M Denecke, Madigan Army Medical Center, Tacoma, WA

435 Assessing the MIAHTAPS Protocol for Workplace Violence Prevention in Emergency Care
P Wolbert, Central Michigan University College of Medicine, Mount Pleasant, MI

436 Combination Rapid- and Long-Acting Subcutaneous Insulin for the Management of Mild to Moderate Diabetic Ketoacidosis
F Ibarra, Community Regional Medical Center, Fresno, CA

437 Use of a Sepsis Prediction Model to Augment Acuity Assignment and Improve Triage Process
G Elmquist, University of Texas Southwestern Medical School, Dallas, TX

438 Identifying and Addressing Health Care Barriers for Frequent Emergency Department Visitors
A Kahlun, Dell Medical School, Austin, TX

MONDAY, SEPTEMBER 30, 2024

2:00 PM

RF37 Infectious Disease

Room 1

198 Assessment of the Prognostic Significance of Granulocytic Subpopulations in Patients With COVID-19
M Lumare, Università Cattolica del Sacro Cuore, Roma, Italy

199 Evaluation of the Diagnostic Accuracy of Exhaled Nitric Oxide as a Marker of Infection and Sepsis in Emergency Department Patients
M Zwank, Regions Hospital, Saint Paul, MN

200 Diagnosis and Treatment of Trichomonas by Urinalysis in the Emergency Department: Incidence, Sensitivity, Co-infections, and Treatment (2019 - 2023)
B Hauser, Ascension Providence Hospital, Southfield MI

201 A Recombinant Native Human Anti-Tetanus Monoclonal Antibody Versus Human Tetanus Immunoglobulin for Passive Immunization Against Tetanus: A Double-Blind, Randomized, Phase 3 Trial
S Liu, Zhuhai Trinomab Pharmaceutical Co., Ltd., Zhuhai City, China

202 Navigating the 'Twindemic': A Predictive Model for Emergency Department Length of Stay in COVID-19 and Influenza Patients
J Emakhu, Henry Ford Health, Detroit, MI

510 Long COVID: Predictive Factors and Prevalence in Population
M Novelli, Università Cattolica del Sacro Cuore, Rome, Italy

RF38 Informatics & AI

Room 2

203 Enhancing Artificial Intelligence Performance in Bilingual Emergency Medicine Board Exam: The Impact of Retrieval-Augmented Generation
Y Chang, China Medical University Hospital, Taichung City, Taiwan

204 Result Push Notifications Improve Time to Emergency Department Disposition: A Pragmatic Observational Study
S Dutta, Massachusetts General Hospital, Boston, MA

205 Leveraging Large Language Models for Improving Clinical Outcomes in the Emergency Department: A Systematic Review
E Abbott, Icahn School of Medicine at Mount Sinai, New York, NY

206 Harnessing Artificial Intelligence to Predict Opioid Overdoses in Emergency Departments: A Systematic Review
A Shenoy, Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Fort Lauderdale, FL

207 Impact of a Best Practice Advisory to Increase Narcan® Discharge Prescriptions for Patients at Risk of Opioid Overdose
E Boccio, Memorial Healthcare System, Pembroke Pines, FL

208 Using Large Language Models to Investigate and Categorize Bias in Clinical Documentation
DJ Apakama, Mount Sinai Hospital, New York, NY

RF39 Neurology

Room 3

210 Efficacy of Sodium Bicarbonate for Treatment of Acute Peripheral Vertigo: A Double-Blinded Randomized Clinical Trial
C Chi, National Taiwan University Hospital, Yunlin Branch, Douliu City, Taiwan

211 Comparing Hyperacute Treatments for Patients With Acute Ischemic Stroke: Community Hospital First Versus Direct-to-Comprehensive Stroke Center
JP Miller, Tufts University School of Medicine, Boston, MA

212 Development of a Clinical Risk Score to Risk Stratify for a Serious Cause of Vertigo: A Prospective Cohort Study
R Ohle, Northern Ontario School of Medicine University, Health Sciences North Research Institute, Sudbury, Ontario, Canada

213 Comparison of Efficacy of Metoclopramide, Promethazine, and Prochlorperazine in the Treatment of Peripheral Vertigo: A Triple-Blind Randomized Controlled Trial
A Al Buraiki, Oman Medical Special Board, Muscat, Oman

214 Effectiveness and Safety of Non-Vitamin K Antagonist Oral Anticoagulant Pretreatment Within 48 Hours in Acute Ischemic Stroke Patients Undergoing Intravenous Thrombolysis
T Tsai, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Chiayi, Taiwan

RF40 Pain Management

Room 4

215 Ultrasound-Guided Erector Spinae Plane Block for Breakthrough Cancer Pain in the Emergency Department: Case Series
P Fallah, University of California San Diego Health, San Diego, CA

216 Cancer Pain in the Emergency Department: What Role Does Compassion Play?
C Coyne, University of California San Diego, San Diego, CA

217 Evaluating the Safety of Ketamine-Dexmedetomidine (Ketodex) Versus Ketamine-Propofol (Ketofol) Combination in Adults Undergoing Procedural Sedation: An Updated Systematic Review and Meta-Analysis of Randomized Controlled Trials
A Silva, University of Rio Verde, Formosa, Goias, Brazil

218 Pain Trajectories Following an Emergency Department Visit and Chronic Pain
F Pacheco, Montefiore Medical Center, Bronx, NY

219 Comparison Between Ultrasound-Guided Femoral Nerve Blocks and Pericapsular Nerve Group (PENG) Block Among Patients With Intracapsular Hip Fractures
K Cheong, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Chiayi, Taiwan

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

MONDAY, SEPTEMBER 30, 2024 —*cont'd*

220 Emergency Department Readmission Rates for Patients Diagnosed With Renal Colic and Discharged With or Without Narcotic Prescriptions
B Eskin, Morristown Medical Center, Morristown, NJ

Poster 10

Poster Hall

439 Using Failure Mode and Effect Analysis to Improve Time to Antibiotics in Febrile Pediatric Oncology Patients Presenting to the Pediatric Emergency Department
K Giusto, Northwell Health, New Hyde Park, NY

440 Impact of Emergency Department Crowding on the Occurrence of In-Hospital Cardiac Arrest: A Propensity Score Matched Study
M Kim, Yonsei University College of Medicine, Seoul, Republic of Korea

441 The Impact of On-Unit Reconstitution of Antibiotics to Expedite Treatment of Pediatric Patients With Possible Sepsis
R Herrin, Oregon Health & Science University, Portland, OR

442 The ICED-SODA Initiative: Improving Compliance With Emergency Department Sepsis OrDer Set Application
W Wiedermann, South Shore University Hospital, Bay Shore, NY

443 Improving Door to ECG Time at a Quaternary Care Emergency Department
C Schaeffer, Vanderbilt University Medical Center, Nashville, TN

444 Patient Identification of Their Emergency Department Providers: Assessing the Impact of a Targeted Intervention
E Farhy, Corewell Health William Beaumont University Hospital, Royal Oak, MI

445 Characteristics and Outcomes of Anaphylaxis in Older Emergency Department Patients
F Bellolio, Mayo Clinic, Rochester, MN

446[EMF] Adapting a Brief Emergency Department Fall Prevention Intervention for Persons Living With Dementia and Their Caregivers
E Goldberg, University of Colorado, Aurora, CO

447[EMF] What Matters Most to People With Dementia in the Emergency Department: A Qualitative Study
M Suh, Baylor College of Medicine, Houston, TX

448[EMF] Characterizing Emergency Department Disposition Conversations for Veterans With Dementia Using Direct Observations
J Seidenfeld, Durham VA Medical Center, Durham, NC

MONDAY, SEPTEMBER 30, 2024

3:00 PM

RF41 Pediatrics

Room 1

221 Opportunities for Antibiotic Stewardship for Pediatric Urinary Tract Infection for Outpatient Emergency Department and Urgent Care Encounters
P Prasher, Phoenix Children's Hospital, Phoenix, AZ

222 Prevalence of Gender Identity and Dysphoria in Adolescent Patients Presenting to a Pediatric Emergency Department With Positive Behavioral Health Screens
R Waddell, University of Arkansas for Medical Sciences & Arkansas Children's Hospital, Little Rock, AR

223 The Optimal Intraosseous Needle Depth Required for Successful Resuscitation in Pediatric Population
M Al-Zakwani, Oman Medical Specialty Board, Al Azaiba, Oman

224 Equity in Timely Pediatric Pain Control With a Triage-Initiated Nursing Protocol
D Brunson, Stanford University, Palo Alto, CA

RF42 Public Health

Room 2

226 Prevalence of People With HIV Visiting the Emergency Department and Linkage to Care Status
M Patel, Henry Ford Hospital, Detroit, MI

227 Assessing the Quality of YouTube Videos on Cannabinoid Hyperemesis Syndrome
H Pham, MSU College of Human Medicine, Grand Rapids, MI

228 HIV Screening in a Sampling of U.S. Emergency Departments, 2022-2023
C Bennett, Stanford University, Palo Alto, CA

229 Effect of HIV Screening on Emergency Department Patient Throughput
A Jones, Denver Health Medical Center, Denver, CO

230 Two Years of Screening and Linkage to HIV Preventive Services for At-Risk Adolescents and Young Adults in a Safety-Net Pediatric Emergency Department
S Terp, Keck School of Medicine of the University of Southern California, Los Angeles, CA

RF43 Quality / Safety

Room 3

231 The Effects of a "Stroke Code" Protocol on the Utilization of Resources for Patients Who Are Outside of the Thrombolytics Window
C Sweeney, Northwell South Shore University Hospital, Bay Shore, NY

232 A Multimodal Quality Improvement Intervention to Reduce Head and Cervical Spine Trauma Imaging
J Luke, University of Cincinnati College of Medicine, Cincinnati, OH

233 Medical Jargon Is Often Misunderstood by Emergency Department Patients
T Wahrenbrock, Cook County Health, Chicago IL

234 Quality Improvement Project to Improve Electronic Transfer of Outside Hospital Records at a Veterans Affairs Hospital
J Jordano, Vanderbilt University Medical Center, Nashville, TN

235 Failed Initiatives to Reduce Violence and Aggression Against Emergency Department Staff
R Ritchie, Medway Maritime Foundation NHS Trust, Gillingham, Kent, United Kingdom

323 Do Disaster Drills Impact Real-Time Patient Care in the Emergency Department?
N Raisch, Shamir Medical Center, Zerifin, Israel

RF44 Resuscitation (Cardiac Arrest)

Room 4

63 Incidence and Mortality of Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis Following Completion of COVID-19 Vaccination: A Retrospective Analysis
K Curtis, Case Western Reserve University School of Medicine, Cleveland, OH

236 Optimization of Low-Flow Time in Extracorporeal Cardiopulmonary Resuscitation for Out-of-Hospital Cardiac Arrest: A Decade-Long Analysis
Y Fu, Far Eastern Memorial Hospital, New Taipei City, Taiwan

MONDAY, SEPTEMBER 30, 2024 —*cont'd*

237 Study of Peri-Resuscitation Troponin and Outcomes (SANTO) Proof of Concept
G Nichol, University of Washington, Harborview Center for Prehospital Emergency Care, Seattle, WA

238 Success of Echocardiography Locations for Cardiac Image Acquisition in Cardiac Arrest
N Sales, North Shore University Hospital, Manhasset, NY

239 Association Between the Area of Maximal Compression Determined With Intra-Arrest TEE and End-Tidal CO_2 in Cardiac Arrest: A Resuscitative Transesophageal Echocardiography Collaborative Registry (rTEECoRe) Study
F Teran, New York Presbyterian Hospital-Weill Cornell Medical Center, New York, NY

240[EMF] Exploring Early Intramuscular Epinephrine for Enhanced Drug Exposure and Early Hemodynamic Support in Cardiac Arrest: A Pilot Study in a Porcine Model
H Palatinus, University of Utah, Salt Lake City, UT

Poster 11

Poster Hall

449 The Effect of Early Sepsis Recognition and Fluid Bolus Initiation on Hospital Outcomes Among Patients With Septic Shock
M Piehl, WakeMed, Raleigh, NC

450 A Video Review-Based Clinical Assessment Tool of Cardiac Arrest Resuscitation Correlates With Higher Chest Compression Fraction
K Carroll, Northwell, Donald and Barbara Zucker School of Medicine at Hofstra, Hempstead, NY

451 Lost Opportunities in the Management of Critically Ill Patients Boarding in the Emergency Department
M Johnson, Albany Medical Center, Albany, NY

452 The Impact of Intravenous Fluid Resuscitation on Clinical Outcomes According to Transport Time in Out-of-Hospital Cardiac Arrest Patients: A Nationwide Observational Study
E Jung, Chonnam National University Hospital, Gwangju, Republic of Korea

453 Found Down and Cold… but Dead? Outcomes Following Hypothermic Out-of-Hospital Cardiac Arrest Without a Witnessed Abrupt Cause for Hypothermia
A Perez, Dell Medical School, Austin, TX

454 Effect of Audiovisual Feedback Device Type on Prehospital Chest Compression Quality During Prehospital Resuscitation
S Lee, SMG-SNU Boramae Medical Center, Seoul, South Korea

455 Analysis of Vector Change Defibrillation by Paramedics for Prehospital Refractory Ventricular Fibrillation
K Dumas, University of South Florida, Tampa, Fl

456 Non-Linear Relationship Between Alcohol Consumption and Neurological Outcomes in Patients With Out-of-Hospital Cardiac Arrest Presenting to the Emergency Department
S Park, Severance Hospital, Seoul, Republic of Korea

457 Intra-Arrest Transport and Good Neurological Recovery Among Out-of-Hospital Cardiac Arrest With Refractory Ventricular Fibrillation: A Nationwide Observational Study
R Hyunho, Chonnam National University Hospital, Gwangju

458 Identification of a Safe and Effective Distal Femur Insertion Site for Intraosseous Access in Adults
G Patel, Mercyhealth Javon Bea Hospital, Rockford, IL

TUESDAY, OCTOBER 1, 2024

10:00 AM

RF45 Plenary 3

Room 1

241 Proof-of-Principle: CRISPR-Based Rapid, Amplification-Free Bacterial RNA Detection for POC Bacteremia Detection
H Ata, UAB, Birmingham, AL

242 Machine Learning Model to Predict Emergency Department Patients Who Left Without Being Seen
D Hunter, Mayo Clinic, Rochester, MN

243 Longitudinal Impact of an Emergency Medicine Summer Fellowship for Under-Represented Medical Students
L Garcia, UCSF, San Francisco, CA

244 Using the National Early Warning Score (NEWS2) to Predict ICU Transfer in Admitted Emergency Department Patients
B Kanga, Case Western Reserve University, Cleveland, OH

245 Optimizing Room Size and Accessibility Improves Emergency Department Operational Metrics
D Dayal, UCLA David Geffen School of Medicine, Los Angeles, CA

RF46 Social Emergency Medicine

Room 2

246[EMF] Using Design Thinking and Community Advisors to Improve Emergency Department Resources for Intimate Partner Violence Survivors
A Lu, UCSF, San Francisco, CA

247 Evaluating Identified Unmet Social Needs in the Emergency Department Utilizing an Intersectionality Framework
G Moon, Duke University School of Medicine, Durham, NC

248 People Experiencing Homelessness Offer Suggestions for Improving Emergency Department Discharge Instructions for People Experiencing Homelessness
O Morgan, University of Miami Miller School of Medicine, Miami, FL

249 A Survey of People Experiencing Homelessness at a County Level Safety Net Emergency Department Assessing Communication and Comprehension of Discharge Instructions
O Morgan, University of Miami Miller School of Medicine, Miami, FL

250 Civil Monetary Penalties Related to Violations of the Emergency Medical Treatment and Labor Act Involving Patients Arriving or Departing With Law Enforcement
S Ahmed, Keck School of Medicine of the University of Southern California, Los Angeles, CA

251[EMF] The Impact of Adverse Social Determinants of Health on Healthcare Utilization Among Heart Failure Patients in a Mobile Integrated Health Program
G Ramirez, Weill Cornell Medicine, New York, NY

RF47 Substance Abuse Disorder

Room 3

252 Overdose Following Medication for Opioid Use Disorder Initiation After Emergency Department Visit
S Weiner, Brigham and Women's Hospital, Boston, MA

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

TUESDAY, OCTOBER 1, 2024 —*cont'd*

253 Prescribing Patterns and Patient Factors in an Emergency Department-Initiated MOUD Program to Combat Opioid Use Disorder Throughout a Changing Landscape
E Bastian, Case Western Reserve University School of Medicine, The MetroHealth System, Cleveland, OH

254 Emergency Department-Based Medication for Opioid Use Disorder: A Five-Year Experience
D Seaberg, Summa Health System, Akron, OH

255 Understanding the Barriers of Emergency Physicians to Prescribing Medically Assisted Treatment for Alcohol Use Disorder
T Scheinert, Hackensack Meridian Health, Hackensack, NJ

256 Buprenorphine Treatment After an Emergency Department Visit for Non-Fatal Opioid Overdose
S Gaiazov, Indivior, North Chesterfield, VA

257 Utilization of a Type-1 Emergency Department Observation Unit for Rapid Very-Low-Dose Buprenorphine Induction in Patients With Opiate Use Disorder
C Buckley, Kings County Hospital, SUNY Downstate Medical Center, Brooklyn, NY

RF48 Telemedicine

Room 4

258 Safety of a Community Tele-Paramedicine Program: Results of a Quality Assurance Review
E Nawa, New York Presbyterian Weill Cornell Medicine, New York, NY

259 A Virtual Physician Evaluation in the Emergency Department Waiting Room Reduces the Frequency of Left Without Being Seen Events: A Pilot Study
A Oostema, Emergency Care Specialists, Grand Rapids, MI

260 Comparison of Mobile Cardiac Outpatient Telemetry Initiated From the Emergency Department Versus Other Settings
A You, University of California San Diego Health, San Diego, CA

261 Shifts in Emergency Department Visits for Lower-Acuity Conditions Among Veterans
A Ramachandran, VA Palo Alto & Stanford University, Palo Alto, CA

262 Does TeleTriage Benefit Emergency Departments?
A Roggio, University of Maryland School of Medicine, Baltimore, MD

263 Tele-Ultrasound Consult Implementation in a Tertiary Care Emergency Department: A Feasibility Study
O Eke, Massachusetts General Hospital, Boston, MA

Poster 12

Poster Hall

363[EMF] Effect of Operator Experience on Outcomes of Emergency Airway Management: The Emergency Department and Intensive Care Unit Intubation Learning Curve
A Clark, Vanderbilt University Medical Center, Nashville, TN

459[EMF] Blood and MRI Biomarkers in Acute Concussion to Identify Blood-Brain Barrier Dysfunction
D Barton, University of Pittsburgh, Pittsburgh, PA

460 The Impact of Category 3 Trauma Activations on Diagnosis and Treatment of Traumatic Intracranial Hemorrhage
M Mannion, Cleveland Clinic Akron General, Akron, Ohio

461 Outcomes of Emergency Response Incidents: Insights From Single-Vehicle Deployments
K Rahim, The Aga Khan University Hospital, Karachi, Sindh, Pakistan

463 A Predictive Nomogram-Based Model for Lower Extremity Compartment Syndrome After Trauma
B Callahan, Wellstar Kennestone Regional Medical Center, Marietta, GA

464 Epidemiology and Risk Factors for Intentional Traumatic Brain Injury
S Taylor, Icahn School of Medicine at Mount Sinai, New York, NY

465 Outcomes of a Single Head CT in Emergency Department Patients With Minor Head Trauma on Anticoagulants and Antiplatelet Medications
I Salahaldin, Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

466 Pediatric Age-Adjusted Shock Index as a Predictor of Mortality by Sex Disparity in Pediatric Trauma: A Pan-Asian Trauma Outcome Study
J Lee, Chonnam National University Hospital, Gwangju, Republic of Korea

467 The Impact of Police vs EMS Transport on Mortality in Trauma Victims: A Systematic Review and Meta-Analysis
V Shapovalov, Lehigh Valley Health Network, Allentown, PA

TUESDAY, OCTOBER 1, 2024

11:00 AM

RF49 Trauma & Injury Prevention

Room 1

264 Changes in Optic Nerve Sheath Diameter Following Rigid Cervical Collar Application in Patients With Traumatic Brain Injury: A Prospective Observational Study in a Tertiary Care Teaching Hospital
V Pemmaraju, All India Institute of Medical Sciences, New Delhi, India

265 Qualitative Assessment of a Pilot Trauma Training Program for Community Health Responders in Rural Nepal
J Junkin, Brown University, The Warren Alpert Medical School, Providence, RI

266 The Association of Early Brain-Based Biomarker Levels and Clinical Outcomes in Traumatic Brain Injury: A Secondary Analysis of the Prehospital TXA for TBI Trial
Z Newman, The University of Chicago Pritzker School of Medicine, Chicago, IL

267 Development of a Machine Learning Model to Predict Alcohol Withdrawal Complications in Trauma Patients
M Arnold, Mount Sinai Hospital, New York, NY

268 Identification of Risk Factors for Unstable Cervical Spine Fractures Not Recognized by Validated Clinical Rules
R Wells, Texas Tech University Health Sciences Center, El Paso TX

269 An Analysis of Suture Breakdown Over Time: Comparison of Five Different Suture Materials
J Cummings, Valley Health System, Las Vegas, NV

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

TUESDAY, OCTOBER 1, 2024 —*cont'd*

RF50 Ultrasound

Room 2

270 Diagnostic Accuracy of Ocular Pathology by Emergency Physicians Comparing Ocular Ultrasound and Digital Fundoscopic Imaging
J Fuchs, Kaiser Permanente, San Diego, CA

271 Transesophageal Echocardiography in the Emergency Department: Development of a Validated Checklist for Training
K Anderson, Stanford University School of Medicine, Palo Alto, CA

272 The Use of Point-of-Care-Ultrasound in Evaluating for Colitis and Diverticulitis in the Emergency Department
S Jose, North Shore University Hospital, Manhasset, NY

273 Artificial Intelligence to Detect Spinal Fluid and Spinal Cord on Ultrasound
J Souza, Columbia University Vagelos College of Physicians and Surgeons, New York, NY

274 Association of Dilated Aortic Root on Point-of-Care Ultrasound With Aortic Aneurysm and Dissection
M Hesami, Yale, New Haven, CT

275 To Do or Not to Do? Qualitative Methods for Ultrasound-Guided Subclavian in the Emergency Department
E Ablordeppey, Washington University School of Medicine, St. Louis, MO

RF51 Administration & Operations

Room 3

10 Influence of Physician Experience on Computed Tomography Utilization in the Emergency Department
A Diallo, Memorial Healthcare System, Pembroke Pines, FL

276 Are Short Stay Units Safe and Effective in Managing Acute Pyelonephritis?
I Balsamo, University Cattolica del Sacro Cuore, Roma, Italia

277 Impact of Initiating a Stroke "Launch Pad" on Timeliness of Thrombolytic Therapy
D Shapshak, UAB, Birmingham, AL

278 Unveiling Gaps: A Comprehensive, Equity-Driven Examination of Emergency Department Discharge Workflows
S Sanapala, New York Presbyterian Weill Cornell Medical Center, NY, NY

279 Association of Increased Advanced Imaging Utilization With the Deployment of a Provider in Triage Model
C Thom, University of Virginia Health System, Charlottesville, VA

280 'What Are We Waiting For?' Conflicting Perspectives on the Emergency Department Boarding Crisis: A Qualitative Analysis of Interviews With Patients, Frontline Providers and Hospital Leaders
M Cumbermack, Weill Cornell Medicine, New York, NY

RF52 Cardiovascular

Room 4

281 Use of Magnetocardiography in the Emergency Department for Diagnosis of Cardiac Ischemia in Acute Chest Pain Patients
T Shen, Mayo Clinic, Rochester, MN

282 Prevalence, Characteristics, and Outcomes of Patients Who Decline Pulmonary Vascular Imaging During Antenatal Pulmonary Embolism Diagnostics
A Campbell, New York University, New York, NY

283 Association Between Shift Work and Acute Coronary Syndrome According to Alcohol Intake and Smoking
E Jung, Chonnam National University Hospital, Gwangju

285 The ECMIPS Trial: Effects of Cardiac Monitoring on Perceived Stress in Unexplained Syncope
C Gottschalk, Virginia Tech Carilion School of Medicine, Roanoke, VA

286 Identification of Secreted Modular Calcium-Binding Protein-1 as a Noval Endogenous Protective Molecule Against Acute Myocardial Infarction-Induced Cardiac Rupture
X Ma, Thomas Jefferson University, Philadelphia, PA

Poster 13

Poster Hall

469 An Analysis of Common Errors in Biliary Point-of-Care Ultrasound
T Zitek, Mount Sinai Medical Center, Miami Beach, FL

470 Novice Point-of-Care Ultrasound for the Diagnosis of Acute Dyspnea in the Emergency Department
J O'Brien, Cleveland Clinic Lerner College of Medicine, Cleveland, OH

471 Retrospective Analysis on the Current Use of Bedside Ultrasound in the Diagnosis of Acute Heart Failure in the Emergency Department
C Cobos, Kaiser Permanente, San Diego CA

472 Blood Culture Contamination Rate as a Novel Way to Assess Safety of Ultrasound Guided Intravenous Catheters
Y Benavie, St Luke's University Health Network- Anderson, Easton, PA

473 Seeing Clearly: Can Emergency Physicians Use Point-of-Care Ultrasound to Identify Mac-on vs. Mac-off Retinal Detachment?
A Yarnish, University of Arizona, Tucson, AZ

474 The Impact of Prehospital Ultrasound Training on Paramedic Simulated Clinical Decision Making
A Roche, University of New England College of Osteopathic Medicine, Biddeford, ME

475 Sono-Starters: A Qualitative Study of Pioneers in the Field of Point-of-Care Ultrasound
R Bellinger, Baylor Scott & White All Saints Medical Center, Fort Worth, TX

476 The Supra-Short Ultrasound Protocol to Assess for Rotator Cuff Tears in the Emergency Department: A Pilot Trial
E Lopez, Mount Sinai Medical Center, Miami Beach, FL

477 The Use of Ultrasound for Pupillometry: A Systemic Review and Meta-Analysis
P Modi, All India Institute of Medical Sciences, Delhi, India

TUESDAY, OCTOBER 1, 2024

12:00 PM

RF53 Education

Room 1

34 Educational Mentorship Program for Underrepresented Minority First-Year Medical Students to Increase Interest and Improve Skills for Acute Care Clinical Rotations
J Wahba, Harbor-UCLA Medical Center, Torrance, CA

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

TUESDAY, OCTOBER 1, 2024 —*cont'd*

287 Medical Students Perceptions, Confidence, and Knowledge of Ultrasound Education: A National Study
M Teixeira, University of Tennessee Health Sciences College, Memphis, TN

288 Trends in Social Media Use in Emergency Medicine Residency Programs
Z Repanshek, Temple University Lewis Katz School of Medicine, Philadelphia, PA

289 Real-Time Implementation of an Advocacy Curriculum to Sustain an Emergency Medicine Residency
B Danboise, Texas A&M University School of Medicine, Corpus Christi, TX

290 Comparison of Characteristics of Emergency Medicine Residency Programs With Unfilled Positions in the 2023 and 2024 Match
C Preiksaitis, Stanford University, Palo Alto, CA

291 Visualizing Pediatric Critical Care FY 2020 - 2022 Fellow Tracheal Intubation Learning Curves
S Je, Children's Hospital of Philadelphia, Philadelphia, PA

RF54 EMS

Room 2

209 Ketamine as a Rescue Drug for Patients Presenting With Benzodiazepine-Resistant Status Epilepticus
P Pepe, Palm Beach County Fire Rescue, West Palm Beach, FL

292 Designing Didactic and Simulation Sessions for Online Medical Control Training for Emergency Medicine Residents
S Balasubramanian, New York Presbyterian Cornell & Columbia, New York, NY

293 Prehospital Antibiotics Reduce Mortality From Septic Shock by More Than One-Half
L Ganti, Polk County Fire Rescue, Bartow, FL

294 The Use of Prehospital Ultrasound: A Scoping Review
J Warren, Harbor-UCLA, Torrance, California

296 Paramedic Choice of IM Midazolam Over IM Ketamine for Behavioral Emergencies
J Winslow, Suffolk County EMS, Yaphank, NY

RF55 Health Equity

Room 3

225 Spatial Clustering and Socioeconomic Correlates of Opioid Overdose Deaths in West Virginia
S Vaswani, New York Presbyterian, Queens, NY

297 Association of Social Determinants of Health With Emergency Department Wait Time Disparities
M Dillan, Case Western Reserve University School of Medicine, The MetroHealth System, Cleveland, OH

298 Sepsis Presentation, Interventions, and Outcome Differences Among Men and Women in the Emergency Department
J O'Brien, Cleveland Clinic Lerner College of Medicine, Cleveland, OH

299 Racial Disparities in Concussion Among High School Students in the United States
J Elliott, Wright State University, Dayton Children's Hospital, Dayton, OH

300 Patient Sex and Age Affects Odds of Receiving POCUS Exam During Emergency Department Visit
M Zwank, Regions Hospital, Saint Paul, MN

RF56 Infectious Disease

Room 4

301 Is the ANCOC Score Effective in Predicting Mortality Risk in Patients With Pneumonia?
M Sacco, Universittà Cattolica del Sacro Cuore, Rome, Italy

302 Evaluation of a Cellular Host Response Test for Risk-Stratifying Patients Presenting to the Emergency Department With Signs or Suspicion of Urinary Tract Infection
R Scoggins, Cytovale, Inc., San Francisco, CA

303 Using a Standardized Sepsis Order Set Reduces Mortality
S Kozik, Dell Medical School, Austin, TX

304 Prevalence of Sexually Transmitted Infections in the United States: A Trend Analysis
V Shapovalov, Lehigh Valley Health Network, Allentown, PA

305 Accuracy of a Host Response Test for Diagnosis of Bacterial and Viral Infections and Prediction of Illness Severity in Emergency Department Patients Is Not Impacted by the Patient's Immune Status
N Whitfield, Inflammatix, Inc., Sunnyvale, CA

306 NAD+ Metabolism Guides Temporal Variation in Macrophage Inflammatory Responses
M Arra, Washington University School of Medicine, St. Louis, MO

Poster 14

Poster Hall

478[EMF] Emergency Nurse and Physician Perspectives on Workplace Violence Strategies to Advance Workplace Safety
K Muir, University of Pennsylvania, Philadelphia, PA

479 The Impact of Short-term Medical Missions on the Resilience of Healthcare Students and Professionals
J Wright, Orlando Health, Orlando, FL

480 Assessing Sleep in Emergency Department Healthcare Workers
K Hoesen, UCSD Emergency Medicine, San Diego, CA

481 The Association Between Organizational Health Culture and Functional Fitness of Emergency Medical Technicians in Taiwan: A Prospective Cohort Study
Y Meng, Taipei Veterans General Hospital, Taipei, Taiwan

482[EMF] Cerebral Microdialysis Fluid as a Source of Protein Biomarkers in a Porcine Model of Traumatic Brain Injury
M Kuhn, University of Cincinnati, Cincinnati, OH

483 Factors Associated With Timely Administration of Thrombolytics in Acute Ischemic Stroke
S Tal, St. Joseph's University Medical Center, Paterson NJ

484 Probability of Acute Stroke Detection in Pre-Hospital and Emergency Department Stroke-Alert Activations
A Clark, Vanderbilt University Medical Center, Nashville, TN

485 Healthcare Resource Use After Etripamil Treatment to Terminate Paroxysmal Supraventricular Tachycardia: A Pooled Analysis of Phase 3 Clinical Trials
C Pollack, University of Mississippi Medical Center, Jackson, MS

486 Presentation and Outcomes of Pediatric Myocarditis in the Emergency Department: A Systematic Review and Meta-Analysis
M Alsabri, St. Christopher's Hospital for Children, Philadelphia, PA

487 Analyzing ECG Quality in a EMS Setting
M Ashkinadze, Huntington Memorial Hospital, Pasadena, CA

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

TUESDAY, OCTOBER 1, 2024 —*cont'd*

TUESDAY, OCTOBER 1, 2024

1:00 PM

RF57 Quality / Safety

Room 1

307 Artificial Intelligence-Enabled Escape Room Simulation for Patient Safety Education
J Butterfield, University of Missouri, Columbia, MO

308 Provider Documentation of Patient HEART Score Following Implementation of a Non-Disruptive EHR-Driven Support Tool
E Boccio, Memorial Healthcare System, Pembroke Pines, FL

309 Novel Addition of Point-of-Care Ultrasound to Medical Screening Exam for Obstetric Patients Reduces Time to Diagnosis of Ruptured Ectopic Pregnancy
V Morris, University of Texas at Houston Health Science Center, Houston, TX

310 An Institutional Guideline With Clinical Decision Support Reduces Computed Tomography Use in Blunt Head Injury: Preliminary Quality Report
D Shanin, Brown University, The Warren Alpert Medical School, Providence, RI

311 Impact of a Best Practice Advisory on Reducing Duplicative ABO/Rh Testing in the Emergency Department
S Londono, Memorial Healthcare System, Pembroke Pines, FL

RF58 Resuscitation (Cardiac Arrest)

Room 2

312 Establishing a Model of Both Asphyxia and Sudden Cardiac Arrest to Determine Post-Arrest Neurologic Injury
J Duldner, Case Western Reserve University School of Medicine, The MetroHealth System, Cleveland, OH

313 Alternative Chest Compression Techniques for Small Rescuers Generate Sufficient Chest Compression Depth
T Okumura, University of Hawaii John A. Burns School of Medicine, Honolulu, HI

314 Mechanisms of VT/VF Rearrest After Out-of-Hospital Cardiac Arrest
S Wisniewski, Ohio University Heritage College of Osteopathic Medicine, Athens, OH

315 Right Ventricular Dilation in Out-of-Hospital Cardiac Arrest Patients Evaluated With Transesophageal Echocardiography: A Resuscitative Transesophageal Echocardiography Collaborative Registry (rTEECoRe) Study
F Teran, New York Presbyterian Hospital-Weill Cornell Medical Center, New York, NY

316 Life or Death Decisions: Understanding Public Perception of Cardiopulmonary Resuscitation in Emergency Departments
J Giolitti, MSU College of Human Medicine, Grand Rapids, MI

RF59 Administration & Operations

Room 3

317 Strategic Initiatives to Manage a Pediatric Emergency Department With a Reduced Emergency Department Pediatric Resident Workforce
A Clawson, University of Arkansas for Medical Sciences / Arkansas Children's Hospital, Little Rock, AR

318 Impact of Emergency Department Waiting Room Volunteers on Patient Satisfaction
J Marshall, Oregon Health & Science University, Portland, OR

319 Adopting the Human Factors Analysis and Classification System into Emergency Medicine Morbidity and Mortality Rounds: A Quality Improvement Study at the Halifax Infirmary
C LeBlanc, Dalhousie University, Halifax, Nova Scotia, Canada

320 Optimizing Critical Lab Alert Callbacks in the Emergency Department: Reducing Interruptions and Improving Timeliness
E Quinn, New York Presbyterian, Queens, NY

321 An Analysis of Time to Completion of Contrast vs Non-Contrast Computed Tomography (CT) Scans Ordered in a Large Public Emergency Department
M Lee, Jackson Memorial Hospital, Miami, FL

RF60 EMS & Disaster

Room 4

322 Clean Cuts With Dirty Tools: Developing a Reusable Procedure Kit for Disaster Relief
W Hendricks, Texas A&M University, EnMed, School of Engineering Medicine, Houston, TX

324 Detection of Extremity Compartment Syndrome Using Ultrasound-Based Shear Wave Elastography: A Non-Invasive Tool for Triage of Extremity Injuries in a Mass Casualty Event
K Gregory, Oregon Health & Sciences University, Portland, OR

325 Medical Student-Led Community-Based Training Leads to Increased Self-Reported Confidence in Life-Saving Bystander Interventions
N Cozzi, Rush University Medical Center, Chicago, IL

326 A Retrospective Chart Review of Patients Presenting With Heat-Related Illness to an Urban Health System in Phoenix, Arizona Over One Decade
M McElhinny, Creighton University School of Medicine, Phoenix, AZ

327 Stayin' Alive: A Retrospective Review of Patients Presenting for Medical Attention at Large-Scale Music Festivals
K Norteman, University of Illinois College of Medicine Peoria, Peoria, IL

Poster 15

Poster Hall

488 Impact of Housing Status and Treatment Engagement for Emergency Department Patients With Substance Use Disorders
C Ryus, Yale School of Medicine, New Haven, CT

489 Incidence Rates and Social Factors Associated With Heart Failure-Related Encounters in Metropolitan Detroit, Michigan, Emergency Departments From 2018-2024
B Haber, Wayne State University School of Medicine, Detroit, MI

490 Linguistic Diversity and Its Impact on Emergency Department Utilization: A Nationwide Retrospective Analysis
L Kerich, University of Texas Southwestern Medical Center, Dallas, TX

492 The Epidemiology and Burden of Uncomplicated Alcohol Intoxication in the Emergency Department
E Legome, Icahn Mount Sinai School of Medicine New York, NY

493 Food Insecurity Prior to Hematopoietic Stem Cell Transplant Is Associated With Malnutrition, Higher Emergency Department Utilization, and Worse Outcomes
M Bergens, Duke University School of Medicine, Durham, NC

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

TUESDAY, OCTOBER 1, 2024 —*cont'd*

494 Demographic and Societal Risk Factors for Pediculus-Associated Severe Anemia in Emergency Department Patients
W Plowe, NYU Grossman School of Medicine, New York, NY

495 Why Patients Choose Care in the Emergency Department
A Host, University of Minnesota Medical School, Duluth MN

496 Pain Intensity Two Weeks After an Emergency Department Visit and Persistent Opioid Use
F Pacheco, Montefiore Medical Center, Bronx, NY

497 Use of Virtual Reality in Adjunct to Anesthesia in Surgery and Anesthesia Requiring Procedures: A Systematic Review and Meta-Analysis
F Marhoon, Tawam Hospital, Al Ain, United Arab Emirates

TUESDAY, OCTOBER 2, 2024

2:00 PM

RF61 Health Services & Outcomes Research

Room 1

328 Potentially Avoidable Transfers in the Trauma Registry
C March, University of Washington, Seattle WA

329 Do Emergency Physicians Need to Seek Urgent Urological Consultation for Renal Colic Patients With Larger Kidney Stones?
S Hashmi, Morristown Medical Center, Morristown, NJ

330 One-Year Outcomes in Operative Versus Non-Operative Management of Acute Appendicitis: Results of a Single State Multi-Year Study of Linked Statewide Databases
M Makutonin, Yale University, New Haven, CT

331 Incidence and Predictors of Unplanned Return Emergency Department Visits: A Systematic Review
S Farhat, Michigan State University College of Human Medicine, Grand Rapids, MI

332 An Emergency Department-Based Care-at-Home Program Increases Access to Post-Discharge Primary Care Appointments
A Kreshak, University of California San Diego, San Diego, CA

333 Effect of Contrast Dye on Renal Function of Those Who Presented With Acute Ischemic Stroke After Computed-Tomography Angiography Head and Neck
A Choi, Broward Health, Fort Lauderdale, FL

RF62 Resuscitation (Cardiac Arrest)

Room 2

334 Resuscitative Transesophageal Echo During CPR Identifies Targets to Improve CPR Quality
D Theodoro, Washington University School of Medicine, St. Louis, MO

335 Assessment of Transesophageal Echocardiography on Chest Compression Fraction and Clinical Outcome in Patients With Non-Traumatic Out-of-Hospital Cardiac Arrest
C Chiang, Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Chiayi, Taiwan

336 $ETCO_2$ as a Prognostic Marker in Cardiac Arrest Patients: A Systematic Review and Meta-Analysis
Y Lee, Chang Gung Memorial Hospital, Linkou Branch, Taoyuan, Taiwan

337 Operational Effects of the Organic Implementation of an Emergency Department-Based Resuscitative Care Unit Model
M Sherman, University of Massachusetts Chan Medical School, Worcester, MA

338 Inter-Rater Reliability and Acceptability of a Clinical Prediction Rule for Opioid-Associated Out-of-Hospital Cardiac Arrest
D Dillon, University of California Davis, Sacramento, CA

RF63 Ultrasound

Room 3

339 Development of an Ultrasound Computer Algorithm Enabled Handheld Device to Detect Pneumothorax Real Time in a Live Swine Model
Z Soucy, Dartmouth Hitchcock Medical Center, Lebanon, NH

340 Does BMI Play a Role in Diagnosing Tubo-Ovarian Abscess?
G Prusky, Medical College of Georgia, Augusta, GA

341 Ultrasound-Guided Vascular Access Training: The Need for Novel Training Phantoms With Realistic Vascular Anatomy and Patient Positioning
M Pergola, University of Arizona, Tucson, AZ

342 What's a FAST Tip? A Systematic Stepwise Approach Utilizing Multireader Consensus to Define the Caudal Tip of the Liver and Spleen With Implications for Artificial Intelligence Development
N Schnittke, Oregon Health & Science University, Portland, OR

343 Beyond the Focused Assessment With Sonography in Trauma Exam: Design and Utilization of a Trauma-Focused Rapid Education Event for Emergency Medicine Attending Physicians
C Paulson, Lehigh Valley Health Network, University of South Florida Morsani College of Medicine, Allentown, PA

344 Use of a Nerve Block Supply Cart in Promoting Ultrasound-Guided Nerve Blocks Done in the Emergency Department
A Virella, North Shore University Hospital, Bayside, NY

RF64 Administration, Operations & Emergency Practice

Room 4

345 Quality vs Speed: Can a Nebulizer Get Asthma Patients Home Faster
D Campagne, UCSF, Fresno, CA

346 A Comparative Analysis of Machine Learning Models in Predicting Emergency Department Patient Volumes in an University Hospital
B Theiling, Duke University School of Medicine, Durham, NC

347 Efficacy of the Weapon Screening Protocol in Mitigating Workplace Violence at Duke Emergency Department
L Siewny, Duke University School of Medicine, Durham, NC

348 Opioid Safety Events in Unmonitored Emergency Department Areas: A Two-Year Retrospective Analysis of Duke Emergency Patients
L Siewny, Duke University School of Medicine, Durham, NC

349 Evaluating the Efficacy of ChatGPT in Generating Discharge Instructions for Common Pediatric Emergency Conditions
A Kahlun, Dell Medical School, Austin, TX

350 Emergency Medicine Around the World: Analysis of the 2023 American College of Emergency Physicians International Ambassador Country Reports
J Lee, Indiana University School of Medicine; Bloomington, IN

Poster 16

Poster Hall

418 Impact of Chief Complaint and Emergency Department Diagnosis on Length of Stay in Pediatric Appendicitis
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From the American College of Emergency Physicians
2024 Research Forum
September 29-October 2, 2024
Las Vegas, NV

The following Abstracts were withdrawn or removed in advance of the 2024 *Research Forum*:
33, 70, 76, 79, 99, 166, 204, 213, 223, 276, 283, 374, 385, 406, 423, 452, 454, 457, 461, 462, 466, 477, 487, 491

1 Cost Comparison and Revenue Generation of Post-Graduate Education for Emergency Medicine Advanced Practice Providers

Brogan A, O'Rourke L, Row K, Foote T/Mayo Clinic, Rochester, Minnesota, US

Background: Emergency medicine (EM) education for Nurse Practitioners (NPs) and Physician Assistants (PAs) has evolved significantly over the past two decades. However, inconsistencies in pre-licensure program requirements among Advanced Practice Practitioner (APP) programs persist, resulting in varying levels of knowledge among APPs practicing in emergency medicine. To address this issue, post-graduate education (PGE) initiatives, including formalized APP residencies and fellowship programs, have been developed with the aim of standardizing emergency medicine education. Unfortunately, the cost associated with these programs poses a challenge for healthcare organizations, especially considering that Medicare does not provide funding for post-graduate APP education.

Study Objective: This study aimed to 1) assess the workforce cost associated with formalized training for NPPAs working in the emergency department, and 2) evaluate the impact of training on billing revenue.

Methods: This study compared the cost of employing NPPA fellows in a structured post-graduate educational program at Mayo Clinic with that of NPPAs hired directly into emergency departments throughout Mayo Clinic Health System. The 2022 budgetary cost of the fellowship training program was divided among the total number of graduates and multiplied by 1.5 years to determine the 18-month cost of training each NPPA fellow. The study then compared this figure to the average 18-month cost of salary and benefits offered to a non-fellowship trained NPPA. Next, the study analyzed billing data over a 6-month interval for all employed NPPAs within the Health System. Providers were categorized into two groups based on training (PGE and non-PGE groups). Relative Value Unit (RVU) generation and Level 5/Critical Care Billing were assessed for both groups.

Results: In 2022, the cost of employing an APP enrolled in the NPPA EM fellowship was 27% higher than that of an on-the-job trained employee when comparing salary, benefits, and educational costs specifically attributed to the fellowship over an 18-month interval. The additional cost of a fellowship trained APP ranged from $32,400 to $35,100 based off calculations using the average salary for an emergency medicine PA, as published by SEMPA. The financial benefit of a fellowship-trained employee only became evident after the organization hired the fellow, through revenue generation. Among the 197 APPs working in emergency departments, the PGE group comprised 27% of total APPs. The PGE group demonstrated a higher RVU generation, with an average of 0.1 RVU more per patient (Table).

Conclusions: The cost of providing formalized post-graduate EM education to an Advanced Practice Provider (APP) was significantly higher than paying a regular employee to work as an NPPA in the emergency department. However, the level of billing was notably higher for graduates of EM APP residency/fellowship programs who later worked in the emergency department. These results suggest that while organizations incur greater expenses to train NPPAs with post-graduate education (PGE), formalized training through residency or fellowship can lead to higher revenue generation within the emergency department through retention of the APP graduate.

	All NPPAs	*Fellows*	*Non-Fellows*
Mean	2.94	3.08	2.89
Standard Error	0.02	0.02	0.03
Median	2.95	3.09	2.88
Standard Deviation	0.31	0.18	0.33
Sample Variance	0.10	0.03	0.11
Range	2.49	0.79	2.49
Minimum	1.92	2.64	1.92
Maximum	4.41	3.43	4.41
Confidence Level(95.0%)	0.04	0.05	0.05
Upper CI (95%)	2.98	3.13	2.94
Lower CI (95%)	2.90	3.03	2.83

No, authors do not have interests to disclose

2 Echocardiographic Activity in Patients Presenting With ECG Ventricular Fibrillation Is Associated With Increased Survival

Gaspari R, Gleeson T, She T, Stowell J, Secko M, Midgley S, Nomura J, Schnittke N, Hipskind J, Scheatzle M, Tozer J/UMass Memorial Medical Center, Worcester, Massachusetts, US

Study Objectives: It has been speculated that patients with Ventricular Fibrillation (VF) demonstrate a range of echocardiographic (echo) findings when presenting to the emergency department (ED). We hypothesized that patients with VF with visualized myocardial fibrillation on echo have greater survival to hospital discharge compared to patients with VF and other echo findings.

Methods: We performed a prospective, observational, 27 site multi-center study of adult atraumatic out of hospital cardiac arrest patients presenting to the ED. Simultaneous electrocardiogram (ECG) and echo were recorded during resuscitation in the ED. Experienced emergency physicians and cardiologists independently reviewed ECG and echo images and were separately blinded to patient and provider information. When there was a disagreement between the initial two reviewers, adjudication by a third clinician was performed. ECGs were interpreted as PEA, asystole, VF, ventricular tachycardia (VT) or sinus rhythm. Echos were interpreted as demonstrating organized contractions, myocardial fibrillation (visualized VF), cardiac twitching, or cardiac standstill. Patients were followed for survival endpoints. Data is presented at Mean and comparison between groups was performed using 95% confidence intervals (95%CI).

Results: A total of 2045 pauses in CPR with simultaneous ECG and echo from 654 patients were included in the analysis. VF was identified on ECG in 19.2% of pauses (n=372 of 1938). Pauses with VF demonstrated cardiac standstill in the majority of cases (52.7%, 47.6-57.7)), followed by myocardial fibrillation (29.3%, 24.9-34.1), cardiac twitching (10.5%, 7.7-14.0) and organized contractions (5.1%, 3.3-7.9). Survival to hospital discharge was greater in VF patients demonstrating any myocardial activity by echo (33.3%, 95%CI 24.3-34.8%) compared to VF patients demonstrating cardiac standstill (8.2%, 95%CI 4.0-15.5%). For VF patients with cardiac activity, those with organized contractions and those with visible myocardial fibrillation showed survival to hospital discharge (57.1%, 95%CI 25.0-84.3% and 29.2%, 95% CI 19.5-41.3% respectively).

Conclusion: Not all patients with VF by ECG demonstrate myocardial fibrillation by echo. Patients with ECG VF and visible myocardial fibrillation did not demonstrate increased survival compared to patients with ECG VF and other echo findings. Patients with ECG VF but myocardial activity by echo had significantly higher survival to hospital discharge rates compared to patients with ECG vfib and no cardiac activity by echo. Echo findings during cardiac arrest may help with decision making for possible interventions for VF but more research is needed.

Yes, authors have interests to disclose
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Consultant/Advisor GE Healthcare, Exo
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Creare LLC, Sonosite/Fujifilm

3 Use of a Large-Language Model to Automate a Severe Sepsis and Septic Shock (SEP-1) Abstraction

Boussina A, Wardi G, Nemati S/UC San Diego, San Diego, California, US Study

Study Objectives: Quality metrics, such as the Severe Sepsis and Septic Shock (SEP-1) quality metric are vital components of healthcare yet require substantial effort and cost to complete. Prior data has demonstrated poor inter-rater reliability of the SEP-1 quality metric and reviewed cases are reviewed months after emergency physicians have provided care for patients, making meaningful feedback inherently challenging. Large language models (LLM) may offer an automated approach to quantification of complex quality metrics, such as SEP-1, which might allow for major cost savings, near real-time feedback to providers and a more global evaluation of an emergency department's quality of care. We seek to test the hypothesis that an LLM would have a high-level of agreement of the SEP-1 quality metric compared to manual review.

Methods: We conducted a retrospective cohort study of 100 random ED encounters with administrative codes of sepsis at a single academic health system that were evaluated as part of our SEP-1 review from 2022. The 63-step SEP-1 abstraction guide was translated into Python and hosted on a HIPAA-compliant cloud. Structured and unstructured data from the subjects' medical record, including demographic data, vital signs, laboratory results and provider documentation in the ED was obtained via Fast Healthcare Interoperability Resources (FHIR). Our system determined the presence of clinical criteria (eg, serum lactate values or vital signs) from structured FHIR data and the LLM identified components of the quality metric from unstructured data (eg, emergency physician notes). The end output of the automated system is a completed SEP-1 metric abstraction, including reason for metric exclusion or non-compliance. Comparison between manual abstraction and our automated model was performed with a Cohen's Kappa score. Any cases of disagreement were evaluated by a study author (G.W.) who served as an adjudicator for discrepant cases. Furthermore, we comparted the difference between the automated SEP-1 score from our system and the manual review cases using Pearson's chi-squared test. For all analyses, a p value < 0.05 was considered statistically significant.

Results: Of the 100 charts included, the LLM system had a 90% agreement with the manual abstractor (kappa $= 0.82$, $p < 0.001$) for inclusion of charts for the SEP1 metric and overall agreement. Of the 10 discrepant cases, the automated system was determined to be more accurate than the manual abstractor in 4/10 cases by the expert reviewer. Of these 100 cases, 38 qualified for the SEP1 quality metric. Compliance between manual abstractor and the automated system was not significant (42.1% vs. 48.7%, $p = 0.71$).

Conclusions: Automated evaluation of complex quality metrics, such as the SEP-1 is feasible with excellent agreement between manual abstraction and a LLM system. Such work may allow for improved feedback to providers in near real-time and could result in significant cost savings. Larger evaluations are required to determine if such an approach could be feasible across other quality metrics and at other institutions.

Yes, authors have interests to disclose
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4 Improving Survival and Reducing Readmissions: Early Nutritional Consultation Initiated via MNA-SF Assessment in Geriatric Emergency Patients

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Background: Malnutrition is more prevalent among the elderly, and its detrimental effects on clinical care outcomes are well-documented. The conventional workflow involves admitting patients from the emergency department to the hospital, conducting nutritional screening during hospitalization, and initiating nutritional consultations. However, there is a delay of 5-10 days between the day of admission and the commencement of nutritional intervention.

Study Objective: To investigate the effectiveness of early nutritional intervention upon subsequent hospital admission for elderly emergency patients identified as malnourished through ICOPE nutritional screening.

Methods: This study is a prospective non-randomized controlled trial conducted from January 2021 to December 2022. The study population included individuals aged 65 and above admitted to the emergency department and subsequently hospitalized. At the emergency department, 1,026 participants with Mini Nutritional Assessment – Short Form (MNA-SF) score of ≤ 7 were enrolled. Participants were divided into two groups: the standard care group, recruited in 2021, which followed the routine inpatient nutritional screening and consultation process, and the active early consultation group, recruited in 2022, which initiated consultations directly upon hospital admission for those identified as malnourished in the emergency department, comprising 628 individuals. The study analyzed the length of hospital stay in both groups and tracked readmission and mortality rates at 1 and 3 months. Statistical

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analysis was performed using Chi-square tests, ANOVA, and Kaplan-Meier survival analysis.

Results: There was no significant difference in the severity of comorbidities assessed by the Charlson Comorbidity Index (CCI) between groups. The active consultation group in 2022 to the standard care group in 2021 showed significantly lower readmission rates at three months and lower 1-month and 3- month mortality rates ($P < 0.001$).

Conclusions: Initiating early nutritional intervention for elderly individuals identified as malnourished through emergency department screening can reach the goal of their nutritional requirements sooner, resulting in lower readmission rates and reduced mortality rates.

Implications: Early nutritional screening at the emergency department and initiating nutritional interventions soon after admission for elderly patients appear feasible approaches that may provide survival benefits.

No, authors do not have interests to disclose

5 Generative AI Summaries to Facilitate Emergency Department Handoff

Genes N, Simon G, Koziatek C, Koesmahargyo V, Mbachu C, Wiesenfeld B, Kim JG, Woo K-m, Dahn C, Wittman I/NYU Grossman School of Medicine, New York, New York, US

Background: Handoff miscommunication is a major source of error and potential harm in patient care. emergency department (ED) handoff to inpatient teams requires multitasking clinicians to recount complex details of patient histories, presentations, results, and responses to interventions. Generative Artificial Intelligence (AI) has shown promise in succinctly summarizing large quantities of clinical data and may help facilitate ED handoff.

Study Objectives: Assess the accuracy, utility and safety of AI-generated visit summaries for patients dispositioned to the inpatient Medicine service pending ED handoff, as rated by ED providers in real-time. A secondary objective was to identify characteristics associated with patients or providers that significantly affected ratings.

Methods: Between February 29 and April 20, 2024 at a large urban academic health center, our Quality Improvement (QI) team monitored our Electronic Health Record's (HER) ED track board and selected a prospective, real-time, convenience sample of new patients with an admission disposition to Internal Medicine pending ED handoff. ED providers for these patients were asked, via our HER's secure chat function, if they were available to review an AI-generated visit summary to facilitate a handoff, and respond to a follow-up survey. If a provider consented, our team followed a pre-specified template to extract elements from the HER (including past medical and social history, chief complaint, triage documentation, ED orders, results, diagnosis, and ED provider note, if available) as input to a HIPAA-compliant version of GPT4-32K, using a prompt for a summary modeled on the IPASS framework. The QI team member then securely messaged the ED provider with the GPT summary output. ED clinicians were then surveyed to rate the GPT output's accuracy and utility on a 5-point Likert agreement scale, to assess any safety concerns, and to provide additional open-ended response field for feedback. Responses for 50 ED admissions, along with provider roles (PA, resident, attending) and visit details (patient age, triage acuity, consults, length of stay), were analyzed in Microsoft Excel (Redmond, WA) and STATA 15.1 (College Station, TX).

Results: The median GPT summary score for accuracy was 4/5 (SE = 0.13); handoff usefulness median score was 4/5 (SE = 0.15). Ratings between Pas, residents and attending were not significantly different, nor was a prior ED-to-ED handoff. Absence of ED provider documentation in the chart at the time of summarization did not significantly affect the score of accuracy or usefulness of GPT output. Consultations, length of stay, or patient age did not significantly affect ratings. Safety concerns were cited in 3/50 summaries, including GPT mischaracterization of a stable patient as unstable, and reporting a resulted chest x-ray as pending. A provider cited concerns that flushes given during dialysis were mischaracterized as boluses (on chart review, however, bolus orders were confirmed). Open-ended responses included the following themes: summaries are too long (n=6), summaries included clinically insignificant lab abnormalities (n=4), summaries reported a completed order (imaging, consult, transfusion) as still pending (n=4). Omissions of several relevant meds or results or were noted (n=6) and EM clinicians disagreed with some AI characterizations of patient stability, vitals and workup (n=8). One ED provider reported an error (GPT summary stated a patient had bilateral leg edema) that was, in fact, documented at triage. The most common comment was positive impressions of the technology incorporated into the handoff process (n=11).

Conclusion: Overall, on-shift ED providers highly rated AI-generated summaries of their admitted patients in terms of accuracy and usefulness, with relatively few patient safety concerns. Further refinement is needed to address inaccuracies and streamline workup details for clarity and relevance. Real-time AI-generated summaries of disparate patient data, with vigilant clinician review, are helpful and may safely enhance the accuracy and detail in handoff to inpatient teams.

GPT Studio (HIPAA-compliant secure instance of ChatGPT) settings:

Model: GPT4-32k
Temperature: 0
Output Max tokens: 4000

System Message (prompt):

You are an ER physician who needs to communicate critical information to the inpatient care team who will assume care of your patients. Using the information provided, generate a summary note using the structure delimited by <> that succinctly communicates the patient's condition, the care given in the Emergency Department, and anticipated next steps in their care. The note should be optimally readable, factually accurate, relevant, complete, concordant with standard clinical practice, and safe if the note were to be followed. Include only information either relevant to the admitting diagnosis or critical to the patient's intended future care that, if omitted, could lead to harm.

<
Summary:
Provide a statement including patient's age, sex, relevant past medical history, chief complaint, ending in the phrase "being admitted to the hospital for" + ED diagnosis + overall severity (stable/unstable).

ED course:
Provide a concise history of present illness.
List pertinent positive or pertinent negative vital signs and physical exam findings, starting with the string "On presentation, " and commenting if any major changes during ED course.

Results:
List pertinent normal or pertinent abnormal lab tests.
List pertinent normal or pertinent abnormal radiology tests.

Interventions:
Provide information on pertinent medications and response to them if this information is known. Provide information on pertinent consults and their recommendations if this information is known.

Clinical impression:
Provide a final clinical impression with reasoning based on information above.

Action items:
Provide a paragraph summarizing what if any pertinent tests or important actions are pending or should be planned inpatient. If none are known, instruct the inpatient team to plan care according to their own assessments. Limit to 1 sentence.
>

No, authors do not have interests to disclose

6 The Emergency Department Sorting Hat: Trends in Triage Accuracy at a High-Volume, Multicultural County Emergency Department

Arnold M, Arnold M, Sommi A, Meyer M, Rodriguez N, Apakama D/Mount Sinai Hospital, New York, NY, New York, New York, US

Study Objectives: Timely and accurate triage in the emergency department (ED) is key to ensuring appropriate care allocation, with mistriage possibly leading to poor resource utilization and adverse patient outcomes. Most US EDs use the Emergency Severity Index version 4 (ESI v. 4), a five-level triage tool that prioritizes patients based on medical urgency and projected ED resource utilization. Nationally, as high as one-third of patients are mistriaged. This study evaluates triage inaccuracies and their implications at a bustling, multicultural county hospital E Queens, New York.

Methods: In this retrospective chart review, we analyzed 419,420 non-psychiatric, non-trauma adult ED visits from January 2018 to December 2023. Initial data available at triage including chief complaints, sociodemographic factors, mode of arrival, past medical history and vital signs; assigned ESI level on arrival; and ED course data including critical outcomes and patient disposition were extracted from each chart. Mistriage rates were calculated by comparing assigned ESI levels against ED outcomes, using explicit criteria for overtriage (the overestimation of patient acuity and resource needs) and undertriage (the underestimation of patient acuity and resource needs). Descriptive and univariate analyses assessed the impact of various factors on triage accuracy.

Results: The diverse patient population had a median age of 44.0 years; with 56.3% men; 39.1% of patients on Medicaid, 17.4% on Medicare 14.3% with

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commercial insurance and 13.9% without insurance. 56.7% were Hispanic or Latin and; 89.6% were non-White; the primary languages spoken were English (44.1%), Spanish (47.0%) and Bengali (2.4%). Median ED length of stay was 362 minutes. Distribution of ESI was 4.2% for level 1 and 10.5% level 2 ("higher acuity"), 60.0% level 3 ("medium acuity"), and 16.0% level 4 and 9.3% level 5 "lower acuity"). The top complaints were abdominal pain (8.1% of all visits), chest pain (5.2%), headache (3.8%), back pain (3.2%) and alcohol intoxication (3.1%). 78.8% of all patients were discharged from the ED; 9.9% were admitted to a hospital floor, 5.1% were admitted to a stepdown unit or intensive care unit, 1.8% were admitted to the observation unit, 0.5% went directly to a procedure or surgery, and 0.3% died in the ED. Strikingly, 0.8% of lower-acuity patients required substantial medical interventions, while 50.9% of higher-acuity patients were discharged without admission, suggesting systemic issues in triage accuracy. Further statistical analysis will elucidate the impact of mistriage on ED resource use and patient outcomes, with initial models suggesting significant associations between mistriage rates and patient disposition outcomes ($p<0.05$).

Conclusion: Our study identifies a critical need for revising triage practices within multicultural, high-volume ED settings. Initial results demonstrate a tangible impact of mistriage on patient care pathways, highlighting the critical need to revise triage practices in this setting. These results will inform evidence-based recommendations for enhancing triage accuracy to improve patient safety and ED efficiency, setting a precedent for triage optimization in similar multicultural, high-volume settings.

No, authors do not have interests to disclose

7 A Year-Long Review of Short Stay Admissions

Madden E, Nawa E, Shemesh A/New York Presbyterian/Weill Cornell, New York, New York, US

Study Objectives: Short stay admissions (SSAs), defined as an inpatient length of stay of under 48 hours, are an area of increasing interest for hospital operations and an important area of care transition and coordination between the emergency department (ED) and inpatient services. In hospitals without Observation Units (Ous), SSAs are of additional interest.

Methods: We retrospectively analyzed a year of SSAs at a large urban academic medical center which encompasses two Eds, with the same faculty and APP group, and without Ous. Inclusion criteria were all patients admitted from the ED with an inpatient length of stay, defined as the time of admission order placement by an ED provider to the time of discharge order placed by an inpatient provider, of 48 hours or less. We excluded patients younger than 18 years old. We engaged in a descriptive analysis to find common admission diagnoses and opportunities for intervention. Inclusion criteria for abdominal pain included those admitted with a diagnosis or chief complaint of abdominal pain, nausea, nausea and vomiting, diarrhea, constipation, pelvic pain, and flank pain. Inclusion criteria for shortness of breath included shortness of breath, cough, pneumonia or upper respiratory infection, and hypoxia. Inclusion criteria for chest pain included cardiac complaint, chest pain, abnormal EKG, NSTEMI or STEMI, and elevated troponin.

Results: Of the 99,571 ED visits in 2022, a total of 25,336 patients were admitted (25.4%) and 6,162 were SSAs (6.2%). The top 3 most frequent admission diagnoses were abdominal pain (n=983, 15.95%), shortness of breath (n=488, 7.3%), and chest pain (n=391, 6.4%). We analyzed 100 patients with abdominal pain and 100 patients with shortness of breath. With respect to intractable abdominal pain 100% of those with pain received 2 or more doses of IV medications for their symptoms prior to admission. Among those with intractable nausea, over 90% of patients received 2 or more doses of anti-emetics. A total of 380 patients (38.67%) were admitted to a surgical service, which included general, transplant, colorectal, vascular, and neurosurgery. For those admitted for shortness of breath, 36% had new or worsening hypoxia. Among this cohort, the most common diagnoses were infectious (43%), cardiac-related shortness of breath (21%), asthma or chronic obstructive pulmonary disease (14%), deep vein thrombosis or pulmonary embolism (6%), and pulmonary effusion (2%). We analyzed 100% of chest pain SSAs (391 patients). 156 (39.90%) had troponin levels that were up-trending or with values consistent with moderate or high risk, 173 (44.25%) received an echocardiogram (echo), 38 (9.72%) received a cardiac CT or cardiac MRI inpatient, 9 (2.3%) received a stress test, 9 (2.3%) received a permanent pacemaker or had a temporary recording device placed, 54 (13.81%) underwent catheterization and 22 (5.63%) received a stent.

Conclusion: These findings suggest there is minimal opportunity to systematically lower the current ED short stay admission rate among the top diagnoses. While short stay admissions may at times reflect an avoidable admission, our examination demonstrates the majority are prudent and not appropriate for ED discharge. Continued monitoring of trends in this population should continue with individualized provider feedback on outliers to ensure optimal health system resource utilization and interdepartmental coordination in the service of high quality patient care.

No, authors do not have interests to disclose

8 Market Share of Emergency Department Annual Visits by Physician Employer Group Ownership Type

Cai A, Jarou Z, Janke A, Gettel C, Rothenberg C, Adelman L, Simpson M, Fisher J, Venkatesh A/University of Pennsylvania, Philadelphia, Pennsylvania, US

Study Objectives: The emergency physician employer market has undergone declining physician ownership, increased corporate ownership (such as private equity), and increased consolidation. Corporate ownership and consolidation in the emergency physician market have previously been characterized by the number of hospitals staffed or limited studies of emergency department (ED) use in Medicare claims. We sought to describe market share by the percentage of ED annual visits seen by different ownership categories of emergency physician employer groups, nationally across all payer types.

Methods: We used four data sources: 1) National Emergency Department Inventories (NEDI)-USA 2021 for ED visit volume data, 2) American Hospital Association 2021 for ED visit volume data not available in NEDI, 3) Ivy Clinicians data for group ownership data as of April 2024, and 4) Centers for Medicare & Medicaid Services (CMS) Hospital General Information as of April 2024. We included 3998 acute care hospitals and critical access hospitals certified by the Center for Medicare and Medicaid Services (CMS) that supply emergency services within the 50 states and the District of Columbia. We excluded hospitals categorized as Veterans Administration, Department of Defense, children's, Indian Health Services, and specialty hospitals. We excluded 93 EDs for which group ownership or ED visit volume data were not obtainable. The primary outcome was market share defined by percentage of ED annual visits. To describe the relative concentration of ED market share by individual groups, within ownership types, we describe proportions of their respective markets captured by the largest groups.

Results: Our analytic sample consisted of 3998 general EDs certified by CMS which accounted for 110 million ED visits in 2021. Market share by percentage (%) of annual ED visits and number of hospitals (n) for each group ownership category were: health system 33.0% (n=1622); private equity 24.8% (n=891); regional clinician partnership 20.7% (n=868); national clinician partnership 13.4% (n=398); single site clinician partnership 8.1% (n=219). Among the 5 total private equity groups, the largest three represented 93.5% of annual ED visits in the private equity share. Meanwhile, the 3 national clinician partnership groups comprise 43.6%, 42.6%, and 13.7%, respectively, of national clinician partnership ED visits. In contrast, the top 31 regional clinician partnerships, 51 single site clinician partnerships, and 63 health system groups comprised 50% market share within their respective categories.

Conclusion: A majority of ED visits are seen by emergency physicians employed by health systems (1 in 3) or private equity owned staffing groups (1 in 4). A small number of private equity and national clinician partnerships comprise large market shares within their respective ownership category, while groups in other ownership categories tend to have smaller relative market share.

No, authors do not have interests to disclose

9 Triaging the Future: Emergency Physician Preferences Between Nurse and AI-Generated Triage Notes

Varughese J, Laterza C, Kolster L, Kalczynski J, McLoughlin L/Morristown Medical Center, Morristown, New Jersey, US

Study Objective: Despite technological advancements such as Point-of-Care Ultrasound and mobilized imaging modalities, effective patient care extends beyond accurate diagnoses and treatment. Studies reveal that effective emergency department (ED) triaging plays a significant role in improving patient outcomes. In previous literature, it was concluded that there was a higher proportion of death or critical illness post ED encounter when patients were inappropriately triaged to a lower acuity. Similarly, sepsis has been an area in which triage and timing of antibiotic and fluid administration are crucial regarding mortality. The integration of Artificial Intelligence

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(AI) into everyday healthcare practices presents an exciting opportunity to address these challenges, especially in resource-limited ED settings. While research on this subject is still minimal, a study from 2017 addressed AI-based tools in emergency room care, particularly regarding Emergency Severity Index designation. They have shown promising results with AI-based software performing comparably to the gold standard of emergency physicians in triaging using case based models. We believe that AI-driven care pathways, including self-triaging, could significantly benefit emergency physicians in decision-making processes. Our study aims to assess emergency physicians' preferences for AI-generated triage notes compared to nursing-generated triage notes.

Methods: This was an observational study with a preference assessment component. Patients arriving at the ED were given an electronic survey via a QR code. The survey duration ranged from 2 to 10 minutes depending on the complexity of their chief complaint. The survey utilized GPT4-turbo, a large language model developed by OpenAI. It dynamically adjusted questions based on self-reported information to generate and refine clickable choices into a self-reported history, which was then used to generate a triage note instantaneously. Patients under 18, those unable to complete the survey independently, pregnant individuals, prisoners, and those from psychiatric facilities were excluded. Nursing triage notes were created based on verbal discussions. Triage notes were de-identified and standardized to appear similar, after which five independent physicians blindly scored their preference using a standard scoring system. Cohen's kappa statistic was then used to ensure appropriate interrater reliability. A power of 90% with a confidence level of 95% to ensure the detection of meaningful differences in preferences for further accuracy and generalizability to emergency physicians.

Results: Preliminary data analysis from the ongoing study, with a sample size of hundreds, shows a clear preference among emergency physicians for AI-generated triage notes over nursing-generated notes.

Conclusion: AI-based triage notes are able to provide a foundation in improving ER care. While software has existed evaluating computer-based models and triaging, we are now at a crucial point in time when the ability to use AI-based triage notes is feasible and more familiar to the general public. Our preliminary results favoring AI-based triage notes over traditional nursing triage suggest a potential shift in favor of AI-driven solutions for optimizing ED workflows, resource utilization, and ultimately, patient outcomes. This study lays the groundwork for further exploration of AI's role in enhancing ED efficiency, patient empowerment, and overall healthcare access.

No, authors do not have interests to disclose

10 Influence of Physician Experience on Computed Tomography Utilization in the Emergency Department

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Background: An emergency physician's medical decision making is a product of their cumulative years of training and clinical experience. As such, decisions surrounding resource utilization and diagnostic testing may be related to years of practice post-residency. This study aimed to describe the association between physician experience and advanced imaging, specifically computed tomography (CT), utilization rate.

Methods: A retrospective observational cohort study of electronic medical records was performed. Patient encounters at a single Level-2 emergency department (ED) within a large, public health system in the southeast United States over a 12-month period were screened for eligibility. ED visits during which a CT was ordered were included in the analysis. Individual physician-level data regarding graduation year from an Emergency Medicine residency program were collected. Descriptive statistics summarizing years of clinical practice and CT utilization rates were measured. The linear correlation between years of practice, post-residency, and CT utilization rate was calculated.

Results: A total of 58,781 ED visits reflecting the care of 20 individual full-time emergency physicians were examined. CT imaging was ordered during 19,483 (33.1%) visits. The average time of practice was 17 years (SD: 10.3 years). A weak positive correlation was observed between CT utilization and years of practice (R=0.26).

Conclusion: CT utilization among emergency physicians was weakly correlated with years of practice. Factors other than duration of clinical practice may play a more significant role in the decision-making process surrounding CT ordering. Identifying these factors may lead to more consistent use of advanced imaging resources in emergency care settings.

No, authors do not have interests to disclose

11 The Effect of Apneic Oxygenation on End-Tidal Oxygen Concentration During Rapid Sequence Intubation

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Background: During rapid sequence intubation, supplemental oxygen is delivered to the paralyzed patient despite the absence of significant tidal volume to extend the duration of apnea without desaturation. End-tidal oxygen (ETO_2) concentration is a measure of the patient's oxygenation status during intubation. The primary aim of this project was to measure the effect of apneic oxygenation on ETO_2 measurements during RSI.

Methods: A prospective observational study of patients presenting to two urban academic centers for which RSI was clinically indicated was performed. ETO_2 was measured at the completion of preoxygenation when the operator attempted to pass an endotracheal tube (T_1) and again when successful endotracheal tube position was confirmed (T_2). ETO_2 was monitored using an M1019A IntelliVue G5 Gas Module (Philips, Amsterdam, Netherlands). Clinical teams were not instructed to perform nor influenced regarding the use of apneic oxygenation during their attempts. The association between apneic oxygen and changes in ETO_2 concentration during RSI was measured using a two-sample student's t-test using SAS v9.4 (SAS Institute, Inc., Cary, NC).

Results: Of the 30 intubations observed, 22 (73%) and 8 (27%) were performed with and without apneic oxygenation, respectively. The mean delta ETO_2 concentrations were 25.1% (SD: 22%) and 27.5% (SD: 25%) for attempts with and without apneic oxygenation, respectively, and the difference between means was not statistically significant (p=0.80).

Conclusion: The utilization of apneic oxygenation does not appear to significantly delay depletion of alveolar oxygen as measured by ETO_2 during RSI in the emergency department.

No, authors do not have interests to disclose

12 Effect of Induction Agent Administration Sequence on Emergency Intubation Success: A Retrospective Bayesian Analysis of a Prospective Cohort

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Study Objectives: Emergency tracheal intubation is associated with risk of adverse events, particularly first-attempt failure and associated complications. Rapid sequence intubation, which is administration of a NMBA and a sedative, is the most common method in emergency intubation. However, the optimal sequence of administration - whether the NMBA or sedative should be administered first - has been poorly studied. Due to pharmacokinetics of agents, a NMBA-first approach could decrease the interval between the onset of sedation and relaxation. This study aims to assess how the sequence of induction agent administration affects intubation success and safety.

Methods: Retrospective analysis of a prospective cohort at Hennepin County Medical Center from January 2021 to January 2024. The cohort included all adult patients undergoing orotracheal intubation in the emergency department. Patients without clear documentation of the administration sequence of sedatives and neuromuscular blocking agents were excluded. Primary endpoint was first-attempt failure, and secondary endpoints included peri-intubation pulse oximetry < 90%, and major complications defined as any of hypoxemia, aspiration, cardiac arrest or esophageal intubation. Bayesian logistic regression with weakly-informative priors was employed to measure the effect of the administration sequence on outcomes.

Results: The study included 2216 patients, of whom 56.6% received the NMBA first. Median age was 47 years and 67.9% were female. The most used sedative was etomidate (88.6%) and the most used NMBA was rocuronium (77.4%). Overall, first-attempt failure occurred in 110 patients (5.0%), including 54 (4.3%) with the paralytic-first strategy, and 56 (5.9%) with the sedative-first strategy. The NMBA-first administration reduced the risk of first-attempt failure with an odds ratio of 0.73 (95% credible interval: 0.46-1.02), with a probability of effect (OR < 1) of 95.7% and relevant effect (OR < 1) of 87.6%. This suggests an approximate reduction of 26% of risk of first-attempt failure compared with the sedative-first approach. No difference was found on risk of hypoxemia or complications. Sensitivity analyses involving frequentist analysis and idfferent priors were consistent with these findings.

Conclusion: This Bayesian analysis supports the hypothesis that a paralytic-first drug administration sequence may reduce the risk of first-attempt failure during emergency tracheal intubation.

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Table 1. Bayesian estimates of odds-ratios, 95% highest-density credible intervals and probabilities of OR < 1 and OR < 0.9 for risk of first-attempt failure, hypoxemia, occurrence of major and any complication.

Response variable	OR	95% CrI	Posterior probability		
			OR < 1	OR < 0.9	OR > 1.1
Primary endpoint First attempt failure	0.73	[0.46-1.02]	95.7%	87.6%	1.4%
Key secondary endpoint Hypoxemia during procedure	0.99	[0.78-1.22]	55.0%	20.3%	17.0%
Other clinical endpoints Major complication*	1.00	[0.80-1.22]	50.9%	16.9%	18.6%
Any complication**	1.00	[0.79-1.22]	53.5%	19.0%	17.2%

*Major complication is defined by occurrence of any event among witnessed aspiration, cardiac arrest within 5 minutes after induction, esophageal intubation, or SpO2 < 90% during procedure.
**Any complication is defined by occurrence of a major complication or pharyngeal, laryngeal, tracheal or dental trauma, or pneumothorax.

No, authors do not have interests to disclose

13 Is the MACOCHA Score Better than Clinician Gestalt in the Emergency Department at Predicting Difficult Airways?

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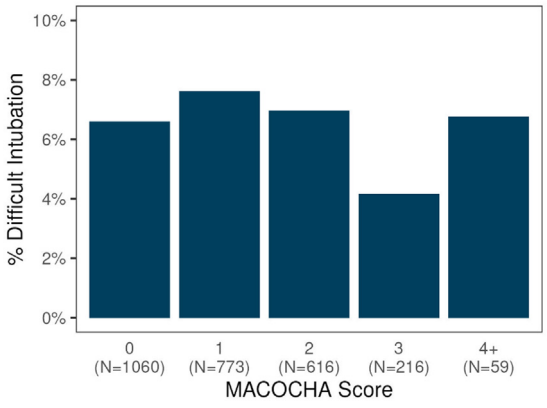
Study Objectives: The MACOCHA score is validated in intensive care settings for difficult anatomical airways. However, its effectiveness in predicting difficult intubations in the emergency department (ED) compared to clinician gestalt remains unexplored. This study aims to evaluate the predictive accuracy of the MACOCHA score in identifying difficult intubations in the ED and compare it with clinician gestalt.

Methods: This was a pre-planned analysis of a large prospective registry-based cohort study of patients intubated at 18 Eds across several regions of Brazil, including academic and community centers, between March 2022 and April 2024. The primary outcome was 28-day mortality. Variables such as procedural characteristics (indication for intubation, techniques, drugs used, devices, and adverse events) and patient characteristics (age, sex, comorbidities, severity of illness) were extracted. All emergency intubations performed on patients aged 18 years and older were included, excluding those carried out during cardiac arrest. Data were collected 30 minutes after the conclusion of each procedure using a standardized REDCap survey completed by an observer involved in the procedure. A principal investigator from each site accessed outcomes 28 days post-intubation. Enrollment occurred from March 2022 to April 2024. Each center appointed a case manager responsible for ensuring compliance with inclusion criteria. Centers with a compliance rate of $\leq$ 80% for any given month had their data excluded from that respective month. A difficult intubation was defined as three or more failed intubation attempts. Patients were separated into two groups: <3 intubation attempts and ≥ 3 attempts. Predictive metrics such as sensitivity, specificity, accuracy, and the Area Under the Curve (AUC) were calculated for both methods.

Results: A total of 2945 intubations were enrolled for analysis. Difficult intubation was reported in 207 (7%) intubations. The median age was lower in patients with ≥ 3 attempts, 55 (IQR, 44-68) vs. 64 (IQR, 50-73). The difficult intubation group's body mass index was higher (26.2 vs. 25.7, p=0.004). The difficult intubation group had a higher prevalence of Cormack-Lehane grade 3-4, 29.9% vs. 4.6%, $p < 0.001$. Patients in the difficult airway group had lower oxygen saturation during airway management, 78 (67-90) vs. 95 (86-99), $p < 0.001$. First provider experience from medical graduation was higher (3 years vs. 2 years) in the group with <3 attempts. The difficult intubation group was associated with higher rates of complications: dental trauma, 6 (2.9%) vs. 6 (0.2%), $p < 0.001$; aspiration, 13 (6.3%) vs. 16 (0.6%), $p < 0.001$; airway injury, 5 (2.4%) vs. 3 (0.1%), $p < 0.001$. There were no differences in 28-day mortality between the groups, 1319 (48.2%) vs. 93 (44.9%), p=0.82. Clinician gestalt predicted a difficult airway with a sensitivity of 53.6%, specificity of 75.1%, accuracy of 73.6%, and an AUC of 0.644 (95% CI: 0.609-0.679). In contrast, the MACOCHA score did not effectively predict difficult intubations, yielding an AUC of 0.492, which indicates no better predictive value than random chance.

Conclusion: Clinician gestalt outperformed the MACOCHA score in predicting difficult airways in the ED, but its performance is still suboptimal. There is a need for ED-specific assessment tools for difficult airways. Reasons for the poor performance of the MACOCHA score need to be further explored.

Figure 1: Comparison of patient MACOCHA score and difficult intubation, defined as 3 or more intubation attempts



No, authors do not have interests to disclose

14 Some Emergency Department Patients Given Ketamine for Conscious Sedation Become Apneic

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Background: Patients with orthopedic injuries and severe pain are often given parenteral narcotics in the emergency department (ED). When conscious sedation to treat these injuries is planned, ketamine is often chosen because it is a hypnotic, amnestic, bronchodilator, antidepressant and analgesic that preserves airway reflexes and respiratory drive. However, we gave ketamine to a patient undergoing conscious sedation who had an unexpected respiratory arrest. Although this has been described in individual case reports and tallied in other studies–but without specific patient details– no one has systematically reviewed the experience in a single emergency department. We do so here.

Methods:

Design: Retrospective cohort.

Population: Patients from 6/2/2018 - 12/31/2023.

Setting: a suburban ED with 100,000 annual visits.

Data Analysis: We searched for patients given both ketamine and naloxone in a single visit who were undergoing conscious sedation for an orthopedic procedure. We report patient characteristics and ED course.

Results: The database contained 537,575 ED visits; Most of the 22 patients receiving both ketamine and naloxone were undergoing endotracheal intubation. Of the 6 patients receiving conscious sedation for an orthopedic procedure, two were excluded because one had arrived with a narcotic overdose and the second was given both narcotics and benzodiazepines for a difficult dislocation reduction, leaving four included patients. Their characteristics and ED course are summarized in the Table. Patients were from a wide age range, suffered both fractures and dislocations, received the ketamine from around the time of the narcotic to up to 2.5 hours later, and had an episode of respiratory compromise from 4 to 33 minutes after the ketamine. All patients rescued with naloxone recovered uneventfully.

Conclusion: Even though ketamine has become increasingly popular for conscious sedation because of its normally beneficial respiratory effects, we report apnea after ketamine when opioids were also given. The likely explanation of this is that ketamine and treatment of the orthopedic injury reduces the painful stimulus so that the opioid-induced respiratory depression is no longer opposed by pain, and the patient stops breathing. We recommend naloxone at the bedside when performing conscious sedation with ketamine when opioids have also been given.

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TABLE: CHARACTERISTICS OF PATIENTS AND ED COURSE

Age (years)	4	15	84	90
Gender	Female	Female	Male	female
Bone/joint involved	Ulna	Ankle	Hip	Shoulder
Injury	Fracture	Fracture/dislocation	Dislocation	Fracture/dslocation
Narcotic used	Fentanyl	Morphine + fentanyl	Morphine	Morphine
Total Dose (mcg/kg)	1	70 + 1.2	70	70
Time before ketamine (min)	-3	68 and 6	163 and 138	120 and 97
Ketamine dose (mg/kg)	1	1.2	1	2
Reason for naloxone	pCO2 increased to 47	Unresponsive verbally	Apnea	Difficulty breathing
Other intervention	Bag valve mask		Sternal rub	
Time: ketamine to naloxone (min)	33	4	12	5
Naloxone dose (mcg/kg)	50	3	4	33
Patient disposition	Home	Admitted	Admitted	Admitted

No, authors do not have interests to disclose

15 Diagnostic Performance of the MI^3 Machine Learning Algorithm in Patients With an Initial Indeterminate Troponin

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Study Objectives: Ruling out myocardial infarction (MI) among emergency department (ED) patients with an indeterminate (detectable & mildly elevated) initial troponin measure is challenging for emergency clinicians. MI^3 is a machine learning algorithm designed to aid the diagnosis of MI, but it has yet to be studied in an ED population with indeterminate troponins. Thus, this study seeks to evaluate the diagnostic performance of MI^3 among patients presenting to the ED with chest pain who had an initial indeterminate troponin measure.

Methods: We conducted a secondary analysis of the CMR-IMPACT trial cohort, which prospectively enrolled adult patients with symptoms suggestive of acute coronary syndrome who had an initial clinical contemporary troponin of 0.006-1.0 ng/ml across four U.S. hospitals. For this analysis, patients with initial and 3-hour high-sensitivity cardiac troponin I (Abbott Laboratories) measures were included. Each patient was classified by MI^3 into low-, moderate-, and high-risk groups. The primary outcome was adjudicated MI at 30 days. The sensitivity, specificity, and negative likelihood ratio (-LR) of MI^3 for MI at 30 days was calculated and reported with 95% confidence intervals. A receiver operator characteristics curve for MI at 30 days was created and area under the curve (AUC) for MI^3 was calculated.

Results: Among 207 patients, 34.3% (71/207) were female and 33.3% (69/207) non-white, with a mean age of mean age 61±11 years. Among these patients, within 30 days, MI occurred in 43.5% (90/207). The AUC for MI^3 for the detection of MI at 30 days was 0.882 (95%CI: 0.833-0.932). MI^3 classified 34.8% (72/207) of patients as low-risk, of which 8.3% (6/72) had MI at 30 days, yielding a sensitivity of 93.3% (95%CI: 86.1-97.5%) and -LR of 0.12 (95%CI: 0.05-0.26). Among the 47.3% (98/207) classified as moderate-risk, MI at 30 days occurred in 48.0% (47/98). MI^3 classified 17.9% (37/207) as high-risk, among which 100% (37/37) had MI at 30 days, yielding a specificity of 100% (95%CI: 96.9-100%).

Conclusion: Among ED patients with an initial indeterminate troponin measure, the MI^3 machine learning algorithm had an excellent AUC and high specificity, suggesting that it may be useful as an aid in diagnosis of MI in this challenging patient population.

Yes, authors have interests to disclose
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Disclosure: Abbott Laboratories
Employee
Abbott Laboratories
Disclosure: Abbott Laboratories
Employee
Abbott Laboratories

16 Deriviation of a Clinical Decision Aid to Rule Out Acute Aortic Syndrome in Patients Presenting to the Emergency Department With Chest Pain

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Background and Study Objectives: Acute aortic syndrome (AAS) is a rare clinical syndrome encompassing acute aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer. It has a high mortality and is often missed. There are no validated clinical decision aids that can define a low-risk group requiring no further investigation. The objective of this study was to create a clinical decision aid that can rule out AAS in patients presenting to the emergency department with chest pain.

Methods: Multi-centre historical cohort study. We recruited consecutive patients presenting to one of 68 emergency departments with non-traumatic chest pain. AAS outcomes were identified through an admission, discharge or death certificated diagnosis of acute aortic syndrome. We developed multivariate models to predict AAS. We used recursive partitioning, logistic regression and machine learning techniques. We report sensitivity, specificity, positive/negative likelihood ratio and 95% CI. We used multiple imputations by chained equations to handle missing data. We estimated a sample size of 100 outcomes to derive a decision aid with 100% sensitivity and a 95% CI of 98-100%.

Results: We recruited 148,839 patients presenting with non-traumatic chest pain(129 cases of acute aortic syndrome(0.09%)). The simplest model was through recursive partitioning. We created a 4 variable rule: Age >50, Diastolic blood pressure >100mmHg, previous AAS, Severe Pain (>7/10). The rule had a sensitivity of 99.2% (95% CI 95.6- 99.9%), specificity of 48.6%(95%CI 48.3 – 48.8%), Positive likelihood ratio of 2 (95% CI 1.9-2.1), negative predictive value of 0.03(95% CI 0.01-0.1). The most accurate model was through machine learning (10-fold Cross-Validation and random forest technique). This model included age, sex, d-dimer, HBA1C, Hemoglobin, absolute lymphocyte count, percentage lymphocyte count, absolute neutrophil count, platelets, troponin, diastolic blood pressure, systolic blood pressure, GCS, height, pain score, pulse oximetry, heart rate, respiratory rate, temperature and weight. Random Forest had high sensitivity (100%, 95%CI 97.1-100%) and specificity (98%, 95%CI 98.1-98.3%), demonstrating strong precision (0.982), F1-score (0.991), and accuracy (0.991).

Conclusion: AAS is a rare diagnosis with a prevalence of 0.09% in patients presenting to the emergency department with chest pain. We have developed a simple bedside assessment tool and a more complex but more accurate tool to rule out AAS. If they are externally validated, they have the potential to improve the diagnosis and treatment of patients with AAS.

No, authors do not have interests to disclose

17 Determinants of Guideline-Directed Anticoagulation in Emergency Department Patients Admitted With Acute Pulmonary Embolism

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Study Objectives: Despite guideline recommendations for use of low molecular weight heparins (LMWHs) or direct oral anticoagulants (DOACs) in the treatment of most patients with acute pulmonary embolism (PE), studies in the United States demonstrate an increasing use of unfractionated heparin (UFH). Our objective was to identify barriers and facilitators of guideline-directed anticoagulant use in patients being admitted with acute PE.

Methods: We conducted semi-structured interviews with a purposeful sample of emergency physicians and hospitalists. Physicians were recruited from community and academic practice settings. We used maximum variation sampling to recruit physicians with high or low use of UFH in acute PE. We developed and piloted an interview guide using the implementation science frameworks—the Consolidated Framework for Implementation Research and the Theoretical Domains Framework. Interviews were recorded, transcribed, and analyzed in an iterative process using reflexive thematic analysis.

Results: We interviewed 24 emergency physicians and 13 hospitalists. Participants were diverse with regard to practice setting, years in practice, and primary anticoagulation strategy (UFH v. LMWH). Most clinicians were agnostic to

anticoagulation choice and did not perceive significant differences between UFH and LMWH with regards to risk (eg spontaneous bleeding, delay in therapeutic anticoagulation). Participants reported that institutional culture, clinical inertia, and hassle bias played a significant role in determining anticoagulation choice. Barriers to guideline-directed use of LMWH included the perception of UFH as "quick on, quick off" therapy, fear of decompensation or bleeding, and the desire to allow freedom in treatment modification. Facilitators of guideline-directed use included institutional protocols, knowledge of the pharmacokinetics of UFH, and the burden of UFH infusion protocols on patients and nursing staff.

Conclusion: Common barriers and facilitators exist to the use of guideline-directed anticoagulation in patients, particularly with regard to knowledge, fear, and institutional culture. Implementation efforts may consider targeting these domains.

Theme (subtheme in italics)	Theoretical domain (CFIR / TDF)	Representative quote (participant ID)
Fear of decompensation	Characteristics of individuals (CFIR) / Knowledge / Emotion (TDF)	*"if there is clinical decompensation and a decision to do some sort of an intervention, the heparin can be basically stopped or reversed and stopped."* (EM22)
Agnostic to anticoagulation choice	Characteristics of Individuals / Knowledge	*"In my own practice, it almost never matters which anticoagulant I choose"* (EM12)
Clinical inertia	Characteristics of Individuals	*"I guess it's just kind of what I was taught in residency, and I've never really wavered from that kind of thing."* (EM22)
Institutional culture influences anticoagulation choice	Inner Setting (hospital)	*"If they're going to be admitted the preference is LMWH over UFH. That's been slow to change, but there is some push coming from somewhere. I'm not exactly why, just thinking it's a preferred agent in terms of possibly efficacy."* (H6)
Peer pressure	Emotion / Beliefs about consequences (TDF)	*"I once stepped on a nail because I tried to give somebody a shot of LMWH and admit them to the floor for their PE and sort of got an angry email afterwards about that. so it's it's a little different.."* *(EM12)*
Anticipation of what inpatient/consultants want	Inner setting (CFIR)	*"it's mostly driven by the culture of the institution that I work at… it's what the inpatient team expects [giving UFH]."* (EM23)
Understand catheter directed treatments require anticoagulation		*"the perceived benefit [to UFH] is if they require a procedure, a catheter directive therapy, then it could be stopped and that would help the interventional radiologist. But that's inaccurate, because they would continue anticoagulation regardless of whether it's UFH or LMWH to do the procedure."*
Fear of decompensation	Characteristics of individuals / Knowledge / Emotion (TDF)	*"if there is clinical decompensation and a decision to do some sort of an intervention, the heparin can be basically stopped or reversed and stopped."* (EM22)
Value "quick on, quick off" of UFH	Knowledge / Beliefs about consequences (TDF)	*"I'm mostly a nocturnist, so my job is, you know, I see it as make the right decision for the next 12 h. So my initial, my initial response, assuming that the ER you know, has said that an admission is necessary. I'll usually do a heparin drip…it's easily reversibleand most people do just fine on it and you're essentially already anticoagulated as soon as you start it. And there's minimal follow up from my perspective as a nocturnist. So it's just kind of order it fire and forget…It gives you a good bridge to to make whatever decisions are needed moving forward with there being very little potential negative to that…you're not stopping anybody else from making future decisions."* (H10)
Prioritization of reversibility over iatrogenic bleed	Characteristics of individuals / Knowledge / Emotion / Beliefs about consequences (TDF)	*"In the hospital for me, I feel like, let me start them on heparin and then…if they have other things going on I think it gives me the sense of, 'Oh, I can reverse it whenever I want to.'"* (H9)

No, authors do not have interests to disclose

18 Comparing the Accuracy of Modified HEART Scores for Risk Stratification of Low-risk Chest Pain Patients at the Emergency Department

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Background: The accuracy of risk stratifying chest pain patients at the emergency department (ED) using the HEART (history, ECG, age, risk factors, and troponin level) score has been validated. However, the original HEART score was derived using conventional troponin, which has been replaced by high-sensitivity cardiac troponin (hs-cTn). Several modified HEART scores (mHEART) have been proposed based on different hs-cTn levels, but their comparative accuracies have not been assessed. This study aims to compare the performance of five mHEART scores and evaluate the role of hs-cTn in risk stratifying low-risk chest pain patients at the ED.

Methods: This retrospective single-center observational study included all ED patients with suspected acute coronary syndrome who had HEAR (history, ECG, age, and risk factors) scores calculated and at least one hs-cTnI resulted during their ED evaluation. The hs-cTnI levels measured in the ED were categorized as: 1) 99th percentile upper reference limit (URL, ie, positive, ≥53ng/l for females and ≥78ng/l for males), 2) variation zone (ie, uncertain zone 20-52ng/l for female and 20- 77ng/l for males), 3) limit of detection (LOD, ie, negative: <20ng/l), and 4) limit of quantitation (LOQ, <3ng/l). mHEART scores were calculated based on existing literature reports (see Table). Patients with a Troponin-score of 0 or an mHEART score of 0-3 were classified as low-risk chest pain patients. The 30-day Major Adverse Cardiac Event (MACE) outcomes were compared across different mHEART scores.

Results: From January 1, 2019, to December 31, 2023, a total of 10,486 patients were included, with 337 (3.21%) experiencing 30-day MACE. The 30-day MACE rates were 0.53%, 1.37%, and 2.00% for hs-cTnI cutoffs of LOQ (<3ng/l), LOD (<20ng/l), and URL (<53ng/l for females and <78ng/l for males), respectively. However, when using an mHEART score of 0-3 to define low risk, the 30-day MACE rate ranged from 0.26% to 0.62% across different mHEART scores.

Conclusion: The use of the HEART score for risk stratification of low-risk chest pain patients demonstrates superior accuracy in predicting 30-day MACE outcomes compared to using hs-cTnI alone. All mHEART scores exhibit acceptable accuracy in predicting 30-day MACE outcomes, with mHEART1 identifying the highest number of patients as low-risk chest pain patients.

Table: Different modified HEART scores

	HEART-score	T-score
mHEART1	HEAR + T1 : female<53ng/l, male<78ng/l	0
	female: 53-158ng/l, male 78-233ng/l	1
	female≥159ng/l, male≥234ng/l	2
mHEART2	HEAR + T2: <20ng/l	0
	female: 20-52ng/l, male: 20-77ng/l	1
	female: ≥53ng/l, male≥78ng/l	2
mHEART3	HEAR + T3: <20ng/l	0
	20-59ng/l	1
	≥60ng/l	2
mHEART4	HEAR + T4: <3ng/l	0
	female: 3-52ng/l, male: 3-77ng/l	1
	female: ≥53ng/l, male≥78ng/l	2
mHEART5	HEAR + T5: <3ng/l	0
	3-11ng/l	1
	≥12ng/l	2

No, authors do not have interests to disclose

19 Lack of Telehealth Capable Devices Among Patients With Heart Failure as a Barrier to Virtual Outpatient Follow-up Care

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Study Objectives: Over 3 million emergency department (ED) visits and 1.9 hospital admissions annually in the United States are due to heart failure. However, fewer than half of patients admitted and fewer than 25% visiting the ED with heart failure present to an outpatient clinic visit for follow up within one week after discharge. Telehealth and Mobile Integrated Health are promising alternative strategies for assisting patients who have reduced access to in-person follow-up heart failure outpatient care. However, patients without telehealth capable devices likely cannot engage in virtual only visits. Among patients admitted for heart failure, we aimed to better understand the frequency of and the contributing factors affecting lack of home access to telehealth capable devices.

Methods: This secondary analysis included participants from the PCORI-funded MIGHTY Heart study. The study enrolled adult patients (≥ 18 years old) admitted for heart failure at 11 hospitals in New York City from January 2021 to March 2024. Participants were queried during their hospitalization about their demographic characteristics, financial resources ("Do you have enough financial resources to make

ends meet?"), health literacy (per the Three-Item Health Literacy Screener) and their home access to telehealth capable devices (desktop computer, laptop computer, tablet computer, or smartphone). Multivariable logistic regression models were constructed to identify patients less likely to have home access to a telehealth capable device.

Results: Of the 1,722 participants, their median age was 68 years old (IQR 59-78); 51.9% were female; 26.1% Hispanic, 43.9% Non-Hispanic Black, 24.2% Non-Hispanic White, 5.8% Non-Hispanic Other Race; and 41.8% were single, 28.5% married/partnered and 29.6% divorced/widowed. These participants rated their financial resources available as "not enough" (39.7%), "enough" (53.3%), and "more than enough" (6.9%). Median scores for the three-item health literacy screener were 6 (IQR 3-9); 25.8% had a score $\geq$ 9, indicating probable lower health literacy. Among the 1,722 participants: 14.6% (95% CI: 0.13-0.16) had no telehealth capable device of any type; 73.9% (95% CI: 0.72-0.76) no desktop computer; 54.4% (95% CI: 0.57-0.62) no laptop computer; 73.5% (95% CI: 0.71-0.76) no tablet computer; and 32.8% (95% CI: 0.31-0.35) no smartphone. As shown in the table, patients less likely to have telehealth capable devices were older; Hispanic or non- Hispanic Black; single, widowed, or divorced; reported not having enough financial resources; and had low health literacy.

Conclusion: One in seven patients hospitalized with heart failure did not have home access to any telehealth capable device, thus limiting their ability to have virtual only outpatient follow-up visits. Identification of these patients prior to discharge from the ED or hospital can guide decision-making for follow-up care. Mobile Integrated Health related programs that supply their own telehealth capabilities during home visits can be considered as a strategy for overcoming telehealth barriers for these patients at risk of rehospitalization.

Table: Demographic characteristics, financial resources and health literacy factors associated with lack of home access to telehealth capable devices

n=1,722	No Telehealth Capable Device	No Desktop Computer	No Laptop Computer	No Tablet Computer	No Smartphone
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
Age	1.03 (1.01-1.04)	0.99 (0.98-1.00)	1.02 (1.01-1.03)	1.02 (1.01-1.03)	1.02 (1.01-0.03)
Sex					
Female	Reference	Reference	Reference	Reference	Reference
Male	1.10 (0.82-1.49)	0.91 (0.71-1.16)	1.04 (0.84-1.28)	1.17 (0.93-1.48)	0.93 (0.75-1.17)
Hispanic ethnicity/race					
Non-Hispanic White	Reference	Reference	Reference	Reference	Reference
Hispanic	2.83 (1.81-4.44)	2.90 (2.02-4.15)	2.71 (1.99-3.69)	1.71 (1.22-2.38)	1.32 (0.97-1.80)
Non-Hispanic Black	1.79 (1.16-2.78)	1.47 (1.10-1.97)	1.86 (1.40-2.45)	1.44 (1.07-1.95)	1.13 (0.84-1.51)
Non-Hispanic Other	1.60 (0.78-3.28)	1.35 (0.82-2.21)	1.36 (0.85-2.19)	1.36 (0.81-2.27)	0.86 (0.52-1.43)
Marital status					
Married	Reference	Reference	Reference	Reference	Reference
Single	2.13 (1.42-3.21)	1.74 (1.31-2.31)	2.00 (1.53-2.61)	1.56 (1.18-2.07)	1.23 (0.93-1.63)
Widowed	2.70 (1.69-4.32)	1.79 (1.24-2.59)	2.20 (1.55-3.11)	1.70 (1.16-2.50)	1.40 (1.00-1.97)
Divorced	2.14 (1.30-3.53)	1.82 (1.24-2.67)	1.58 (1.13-2.21)	1.72 (1.18-2.50)	1.16 (0.82-1.66)
Domestic partner	1.82 (0.49-6.69)	3.19 (1.01-10.06)	1.32 (0.57-3.07)	0.43 (0.17-1.06)	1.44 (0.59-3.51)
Financial resources					
More than enough	Reference	Reference	Reference	Reference	Reference
Not enough	1.06 (0.55-2.03)	1.86 (1.20-2.87)	1.91 (1.25-2.92)	1.27 (0.80-2.01)	0.87 (0.56-1.36)
Enough	0.96 (0.51-1.81)	1.46 (0.98-2.19)	1.32 (0.89-1.97)	1.04 (0.67-1.61)	0.90 (0.59-1.37)
Health literacy					
Adequate or high health literacy	Reference	Reference	Reference	Reference	Reference
Low health literacy	1.71 (1.27-2.28)	2.08 (1.54-2.80)	1.35 (1.05-1.72)	1.60 (1.21-2.11)	1.44 (1.14-1.82)

No, authors do not have interests to disclose

20 Outcomes of Apixaban Versus Rivaroxaban in Patients With Nonvalvular Atrial Fibrillation

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Study Objective: Atrial fibrillation (AFib) is the most common cardiac arrhythmia in the elderly, often leading to blood clots and stroke. Direct-acting anticoagulants (DOACs), including apixaban and rivaroxaban, prevent these events. Despite their common use, their comparative efficacy is debated. This study compares mortality, stroke, myocardial infarction (MI), emboli, and bleeding in Afib/Flutter patients on these drugs.

Methods: This retrospective study was performed utilizing the United States Collaborative Network of 64 academic medical centers/healthcare organizations with 112 million patients in the TriNetX database from 2013 to 2021. Patients were included if they were $\geq$60 years old with a diagnosis of Afib and started on apixaban or rivaroxaban within 3 months of diagnosis. A sub-group analysis compared similar cohorts, but without atrial flutter. Patients were excluded if they had pre-existing outcomes, prosthetic heart valve, mitral valve disease, or were taking other anticoagulants. Outcomes evaluated included 3-year mortality, stroke, MI, emboli, intracranial hemorrhage (ICH), blood transfusion as a marker of blood loss, and gastrointestinal (GI) bleeds. Propensity matching was performed demographics, 8 pre-existing diseases associated with mortality, valvular heart diseases, and heparin/enoxaparin.

Results: This analysis identified a total of 221,650 Afib patients prescribed apixaban (n=143,192) or rivaroxaban (n=63,269) before propensity matching. After propensity matching, patients prescribed rivaroxaban were associated with significantly lower rates of 3-year stroke (2.36% vs 1.87%, RR 1.27, p<0.001), MI (2.68% vs 2.08%, RR 1.29, p<0.001), and blood loss (1.24% vs 1.12%, RR 1.11, p=0.04), but no significant difference in mortality (10.24% vs 9.98%, RR 1.03, p=0.13), emboli formation (0.26% vs 0.21%, RR 1.24, p=0.07), ICH (0.33% vs 0.33%, RR 1.01, p=0.96), or GI bleeds (2.06% vs 2.11%, RR 0.98, p=0.51) between the two cohorts. Before propensity matching, rivaroxaban for Afib was associated with significantly lower rates of all outcomes except ICH (see table 1). Results were similar when analyzing patients with Afib without Flutter.

Conclusions: Rivaroxaban was associated with significantly lower rates of mortality, stroke, MI, emboli, blood transfusions (as an indicator of blood loss), and GI bleeds compared to apixaban in the treatment of nonvalvular atrial fibrillation/flutter before propensity score matching. After propensity matching, significant differences persisted in the rates of stroke and heart attacks favoring the rivaroxaban cohort. Given the convenience of once-daily dosing following the initial treatment phase and these findings, rivaroxaban may be considered the preferred DOAC for nonvalvular atrial fibrillation/flutter.

Table 1: 3-Year Mortality, Cardiovascular, and Bleeding Complication Outcomes Before and After Propensity Score Matching

	Before Propensity Score Matching				After Propensity Score Matching			
1a: Atrial Fibrillation with Flutter								
Outcomes	**Apixaban (%)**	**Rivaroxaban (%)**	**RR (95% CI)**	**P-Value**	**Apixaban (%)**	**Rivaroxaban (%)**	**RR (95% CI)**	**P-Value**
Deceased	17,320 (12.10%)	6,312 (9.98%)	1.21 (1.18,1.25)	<0.001	6,474 (10.24%)	6,312 (9.98%)	1.03 (0.99,1.06)	=0.13
Stroke	3,529 (2.50%)	1,175 (1.87%)	1.34 (1.25,1.43)	<0.001	1,480 (2.36%)	1,175 (1.87%)	1.27 (1.17,1.37)	<0.001
MI	3,989 (2.82%)	1,305 (2.08%)	1.36 (1.28,1.45)	<0.001	1,681 (2.68%)	1,305 (2.08%)	1.29 (1.20,1.39)	<0.001
Emboli	390 (0.27%)	131 (0.21%)	1.32 (1.08,1.60)	=0.006	162 (0.26%)	131 (0.21%)	1.24 (0.98,1.56)	=0.07
ICH	535 (0.37%)	207 (0.33%)	1.14 (0.97,1.34)	=0.10	208 (0.33%)	207 (0.33%)	1.01 (0.83,1.22)	=0.96
Blood Loss	2,046 1.43%)	705 (1.12%)	1.28 (1.18,1.40)	<0.001	784 (1.24%)	705 (1.12%)	1.11 (1.01,1.23)	=0.04
GI Bleed	3,298 (2.32%)	1,332 (2.11%)	1.10 (1.03,1.17)	=0.005	1,299 (2.06%)	1,332 (2.11%)	0.98 (0.90,1.05)	=0.51

MI, Myocardial Infarction; ICH, Intracranial Hemorrhage; GI, Gastrointestinal; RR, Relative Risk; CI, Confidence Interval

No, authors do not have interests to disclose

21 The Economic and Mortality Benefits of Delivering at Least 30ml/kg Within 3 Hours of Septic Shock Onset in the Emergency Department

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Study Objectives: Sepsis is the leading cause of inpatient mortality in the United States. While numerous studies have explored the influence of SEP-1 fluid guidelines on patient outcomes, including a mortality benefit, there has been a notable scarcity of literature regarding the economic implications of adherence to SEP-1 recommendations. This study aims to evaluate the impact of early fluid resuscitation on both mortality and hospital costs for patients admitted with septic shock.

Methods: This was a retrospective cohort study in a large community health care system (310,000 annual emergency visits) of all adults (age > 18 years) admitted from January 2017 through December 2022 with an ICD-10 diagnosis of sepsis and an initial emergency department systolic blood pressure < 90 mmHg, mean arterial blood pressure <65 mmHg, or lactate $\geq$ 4 mmol/L. Categorical variables were presented as frequencies and percentages, while continuous variables underwent normal distribution testing and were reported as the median and interquartile range (IQR). Comparison of continuous variables was performed using an independent sample Mann-Whitney U analysis. Generalized linear models and linear regression were used to compute the adjusted effect estimates.

Results: In a cohort of 1602 patients meeting inclusion criteria, 1190 (74.28%) received at least 30mL/kg of fluid after ED arrival. 18.74% received 30 mL/kg within 2-3 hours of onset. Overall mortality was 24.22%, and the requirement for mechanical ventilation in 28.71%. Receipt of at least 30 ml/kg between 2 and 3 hours from sepsis

onset was associated with lower total hospital cost ($67,413 vs $72,788; p-value = 0.04), mechanical ventilation use (22.0% vs 33.6%; OR 0.46 (95%CI 0.31- 0.68), p < 0.01), and overall mortality (16.6% vs 24.3%; OR 0.59 (95%CI 0.38-0.92), p = 0.02). For every hour of delay in achieving 30ml/kg, total hospital cost increases by approximately $1004 after adjustment (p-value = <0.01).

Conclusion: Consistent with other recent reports, our findings show that receipt of 30 mL/kg of fluid within 3 hours is not only linked to decreased mortality and a reduced need for mechanical ventilation in patients with septic shock but also contributes to a reduction in overall hospital costs. These findings provide support for the current fluid recommendations outlined in SEP-1 guidelines.

Yes, authors have interests to disclose
Disclosure: 410 Medical
Board Member/Officer/Trustee 410 Medical
Disclosure: 410 Medical
Employee 410 Medical

22 Exhaled $ETCO_2$ Measured at Emergency Department Triage Is Associated With Positive Blood Culture, ICU Admission and Early Mortality

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Study Objective: Capnography, a noninvasive, real-time method of determining exhaled end-tidal carbon dioxide ($ETCO_2$) and has been shown to predict severe metabolic acidosis in diabetic ketoacidosis and gastroenteritis, as well as determining injury severity after trauma. It has also been associated with sepsis and lactic acidosis and organ dysfunction in febrile patients admitted to the ED. This study assessed the association between $ETCO_2$ and lactate measured at ED triage with positive blood cultures (BC) as well as their association with ICU admission, and in-hospital mortality.

Methods: This prospective observational study enrolled a convenience sample of adult patients presenting to the ED of a tertiary care level one trauma center over 30 months. Patients had initial vital signs measured along with exhaled ETCO2 at triage. Patients were followed throughout their hospital stay. Outcome measures included positive blood cultures, ICU admission, and in-hospital mortality. Means and 95%Cis were calculated along with area under the ROC curve (AUC).

Results: Of 1,136 patients enrolled, 175 patients had BC data available and were analyzed. Of these, 30 (17%) had positive BC and 145 (83%) negative BC. Patients mean age was 62 (SD17) and 57% were male. Overall mean $ETCO_2$ at triage was 30 (95%CI 29-32) mmHg and overall mean lactate was 2.23 (95%CI 1.84-2.62) mmol/L. There were significantly lower levels of $ETCO_2$ in those patients with positive blood cultures. Mean $ETCO_2$ levels in those with positive BC were 27 (23-30) and in those with negative BC 31 (29-33) (p=0.033). However, there was no significant relationship between lactate and positive blood cultures. Mean lactate levels in those with positive BC were 1.80 (1.52-2.07) and in those with negative BC 2.34 (1.86-2.82) (p=0.259). There were 31 (18%) patients admitted to the ICU and mean $ETCO_2$ levels in ICU-admissions vs non-ICU-admissions were 26 (22-30) versus 31 (30-33) (p=0.010) respectively. For lactate, levels in ICU vs non-ICU-admissions were 3.34 (1.77-4.91) versus 1.93 (1.68-2.18) (p=0.003) respectively. The AUC for predicting ICU admission for $ETCO_2$ was 0.69 (0.58-0.79) and for lactate 0.61 (0.48-0.74). There were 13 (7%) patients with in-hospital mortality and mean $ETCO_2$ levels in survivors versus non-survivors were 31 (29-32) versus 23 (18-28) (p=0.007) and for lactate, 2.20 (1.77-2.62) versus 2.92 (1.93-3.91) (p=0.327) respectively. The AUC for predicting in-hospital mortality for $ETCO_2$ was 0.72 (0.58- 0.85).

Conclusion: $ETCO_2$ levels were significantly associated with having positive blood cultures, however, initial lactate concentrations were not. $ETCO_2$ also outperformed lactate in predicting ICU admission and early mortality. $ETCO_2$ measured at ED triage has the potential to be used as a screening tool for predicting severely ill patients at risk of septicemia, ICU-admission, and mortality.

No, authors do not have interests to disclose

EMF

23 Norepinephrine May Regulate Oxidative Stress in Sepsis

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Study Objectives: Dysregulation of reactive oxygenated species (ROS) in peripheral blood mononuclear cells (PBMCs) is thought to contribute to sepsis pathogenesis. It is also theorized that norepinephrine (NE) signaling via the sympathetic nervous system (SNS) can regulate inflammation by modulating immune cells. We hypothesize that NE may play a role in regulating the dysregulation of ROS that occurs in sepsis.

Methods: PBMCs were isolated from patients presenting to the emergency department (ED) and placed into cohorts of control or sepsis. The control cohort patients were defined as patients who presented to the ED without any concern of infection and without abnormal vital signs. The sepsis cohort of patients were patients who presented to the ED with at least 2 positive systemic inflammatory response syndrome criteria and concerns of a lower respiratory tract infection documented by chest x-ray, or a urinary tract infection documented by positive urinalysis. PBMCs were isolated from 3 patients in each cohort and were stained with immune cell surface markers, ROS markers and cytokine markers and analyzed with flow cytometry. Immune cell surface markers utilized include CD3 (T cell marker), CD19 (B cell marker), CD14 (monocyte marker) and CD15 (granulocyte marker). Plasma samples from these patients were analyzed with a human cytokine luminex multiplex assay. In a separate experiment, PBMCs isolated from 3 control patients were cultured and stimulated with hydrogen peroxide (H_2O_2) and lipopolysaccharide (LPS) separately and in the absence and presence of NE for 16 hours. Cells from each condition were then stained as above. Cell culture media from each condition was run on the luminex assay as well.

Results: ROS markers were elevated in the sepsis cohort as compared to the control cohort particularly, in CD3+ cells (47.6% vs 13.8% p<0.0001). CD19+ cells did not demonstrate any significant elevation in ROS. Since, CD14+ and CD15+ cell staining individually demonstrated low amounts of signal, we examined a cohort of cells that were CD3-CD19- which, included all non-T and B immune cells. In this group of CD3-CD19- cells, ROS levels were elevated in sepsis patients as compared to control patients (73.0% vs 46.7%, p<0.0001). Secretion of pro-inflammatory cytokines TNFa (24.26 +/- 8.21 pg/ml vs 2.21 +/- 1.47 pg/ml p<0.01) and IL-6 (12.78 +/- 3.51 pg/ml vs 0.78 +/- 0.29 pg/ml p<0.004) were also increased in sepsis patients as compared to control patients. Similarly, in cell culture experiments ROS markers were elevated when stimulated with H_2O_2 and LPS in both CD3+ cells (H_2O_2: 70.8% vs 22%, p<0.0001; LPS: 34.9% vs 22%, p<0.03) and CD3-CD19- (H_2O_2: 48.1% vs 8.34% p<0.0001; LPS:12.9% vs 8.34% p<0.05) cells and this elevation was curbed by NE (CD3: H_2O_2+NE: 54.3%, p<0.007, LPS+NE: 19%, p<0.05; CD3-CD19-: H_2O_2+NE: 37.33%, p<0.0001, LPS+NE: 6.92%, p<0.006). TNFa secretion was also increased in cells stimulated with H_2O_2 (H_2O_2: 52.7 +/- 5.3pg/ml vs 8.24 +/- 2.41 pg/ml, p< 0.0001) and LPS (56.9 +/- 10.51 pg/ml vs 8.24 +/- 2.41 pg/ml, p<0.0001) and this effect was blunted with NE (H_2O_2+NE: 36.6 +/- 5.1 pg/ml, p<0.02; LPS+NE 38.10 +/- 9.54 pg/ml, p<0.01).

Conclusion: These findings suggest that ROS levels are increased in CD3+ and CD3-CD19- cells during sepsis and that NE may curb these responses. These findings may also shed light on immune cell dysfunction in sepsis. Further study is required to identify mechanisms of immune cell dysfunction, sepsis pathogenesis and NE's role in its regulation.

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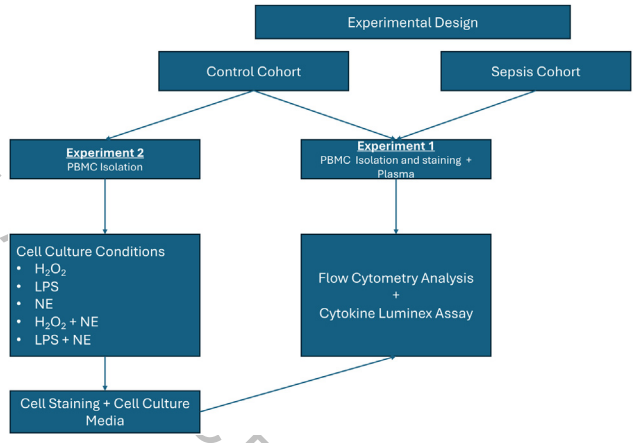

No, authors do not have interests to disclose

24 Comparative Effectiveness of Normal Saline, Lactated Ringer's Solution, and Isolyte on Rate of Lactate Clearance in Shock

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Background: The relative benefits of crystalloid choice on resuscitation is an ongoing debate that, despite extensive research, has yet to be definitively resolved. Given the ubiquity of crystalloid use for resuscitation, further investigation is warranted.

Methods: This is a multi-center retrospective study that compares the rate of lactic acid clearance of different types of isotonic crystalloid fluid in patients with shock in both the ED and inpatient settings. Crystalloids evaluated included normal saline (NS), lactate ringer's (LR), isolyte (ISO), and mixed crystalloid (combination of isotonic fluid). Rate of lactic acid clearance was determined based on fluid type, fluid volume and time between lactic acid samplings. The change in lactic acid (dLA) per minute was then calculated for the initial two hours of the resuscitation period and for the entire course of lactic acid sampling. The dLA was stratified for each fluid and type of shock, defined as cardiogenic, hypovolemic, septic, and other. The rates of acute kidney injury (AKI) and in-hospital mortality were also evaluated. Crystalloids were then compared by dLA against the amount of intravenous fluid (IVF) the patient received from crystalloid as well as total IVF volume, including blood products, medications, and crystalloids.

Data Analysis: The sample size of this study required unadjusted z or t tests for proportions or means as appropriate for each of the comparisons of dLA by crystalloid and shock state. No adjustment for multiple comparisons was performed. dLA was compared against IVF in the intervals between lactic acid draws and displayed in scatterplot charts. A linear regression was performed to further assess for significance. The data was small in sample size, therefore meaningful multivariate linear regression statistical analysis was not performed. P-value < 0.05 was considered statistically significant.

Results: Three hundred forty-one patients were identified, 115 were excluded due to missing data. Of the 226 charts reviews, 72 patients received ISO, 22 patients received LR, 100 received NS, and 34 received mixed crystalloids. A total of 488 lactic acid samples were assessed and compared to fluid type, shock type and volume of resuscitation fluid received. All p values were >0.05 for dLA, AKI and mortality across all shock types and crystalloid fluid type administered except for cardiogenic shock. In cardiogenic shock, LR had a statistically significant superior rate of lactic acid clearance when compared against mixed crystalloid with p value of 0.04. When the dLA was plotted against IVF given, all crystalloid fluid types displayed a negative correlation between volume and dLA, which became more similar when the total volume of resuscitation was considered.

Conclusion: Type of crystalloid did not significantly impact lactic acid clearance, AKI, or mortality with the possible exception of LR in cardiogenic shock. The most important factor in resolving the shock state in fluid responsive patients appears to be the total volume of fluid administered.

No, authors do not have interests to disclose

25 The Effect of Early Fluid Resuscitation on Mortality in Sepsis: A Systematic Review

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Study Objective: While general agreement exists on many sepsis management principles, the details of early fluid resuscitation in sepsis remains contentious. We previously observed improved survival with early initiation of fluid resuscitation, ranging from prehospital to 120 minutes from sepsis onset. The aim of the current review is to expand examination to include the dosing and timing of fluid resuscitation on mortality in sepsis.

Methods: Systematic review to evaluate the impact of early (within 8 hours) fluid resuscitation on mortality in sepsis, including studies evaluating dosing, timing, and guideline-based resuscitation (prespecified volume over a defined period). Studies included retrospective data, adjusting for confounding, and prospective studies for adult patients ($\geq$18 years) with a minimum of severe sepsis (Sepsis-2) or sepsis (Sepsis-3). Studies specific to only potentially-volume-sensitive patient cohorts were excluded. Relevant articles and systematic reviews were obtained from PubMed, Scopus, Cochrane, and Google Scholar from 1-1-2000 to 4-17-2023.

Results: From 1,990 citations, 26 studies were included with a 27.1% (19.8-38.6%) median mortality. For fluid administration of 30 mL/kg evaluated over a time range, three studies observed a survival benefit with earlier fluid completion. For studies evaluating prespecified fluid volume completion (typically 30 mL/kg) within discrete time periods: $\leq$1 hour – one study observed survival benefit; $\leq$2 hours – one study observed survival benefit; $\leq$3 hours – one study observed survival benefit and three studies observed no mortality impact; $\leq$6 hours - two studies observed a survival benefit, four studies observed no impact, one study observed increased mortality risk, and one study observed mortality risk only within a subgroup with a higher severity of illness. Dosing studies: nine studies observed either a survival benefit with increasing fluid volume dosing (ranging 20 to 45 mL/kg) or mortality risk when low fluid volumes were administered (<20 mL/kg) during early fluid resuscitation. Three studies showed mortality risk when fluid volume dosing exceeded higher limits (>30-45 mL/kg) during early fluid resuscitation. One prospective study showed no mortality difference between two resuscitative strategies receiving an estimated $\sim$34 mL/kg (early vasopressors) vs $\sim$58 mL/kg (liberal fluids) within the first seven hours of resuscitation. Another prospective study showed no mortality difference between two resuscitative strategies receiving 30 vs 43 mL/kg within the first eight hours.

Conclusion: 1) early fluid dosing <20 mL/kg is associated with increased mortality risk; 2) studies largely support the safety, and in some cases survival benefit, with early 30 mL/kg dosing; 3) studies specific to fluid administration timing observe survival benefit when given within 2-3 hours; 4) the impact observed with larger volume resuscitation (>45 mL/kg) is mixed and requires further evaluation. These conclusions are mainly based on observational/low-quality evidence.

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Table: Impact of early fluid dosing, timing, and guideline-based resuscitation on mortality in septic patients

Dosing

Study	Time from sepsis (hour)	Test-mL/kg: Cont. (C), Group (G), Binary (B), Prospect. (P)	0-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	>60
Juoffroy	Prehos	G:<10,10-20,>20												
Wang	1	G:<20,20-30,>30												
Kuttab	3	C: 0 - 60												
Hu	3	G: 7 vs 33 vs 44 vs 59												
Lee	3	C: 20 - 45												
Archarya	6	C: 0 - 44												
Rajdev	6	C: 0 - 29												
Waechter	6	G: 20 vs 35 vs 62												
Sheer	6	G:<13,13-27,>27												
Leisman	6	G:<5,5-19,20-35,>35												
Huebinger	6	B: 20 vs 71												
Shapiro	7	P: 34 vs 58												
Liu	8	C: 0-45 and >45												
Macdonald	8	P: 30 vs 43												

Timing

Study	Fluid dose administered (mL/kg)	0-30	31-60	61-120	2-3hr	3-4hr	4-5hr	5-6hr	>6hr
Hu	30								
Wang	30								
Seymour[&]	30								

Guideline-based (binary)

Study	Time sepsis onset (hour), 30 mL/kg	Survival benefit	No mortality impact	Increased mortality
Jeong	1			
Hu	2			
Kuttab	3			
Abe	3			
Baghdadi	3			
Lee	3			
Levy	6			
He	6			
Ferrer (20 mL/kg)	6			
Miller (20 mL/kg)	6			
Truong	6			
Zheng	6			
Huebinger	6			

Fluids favorable
No impact
Harmful (timing = delay in administration)
No conclusions can be drawn

[&]Small survival benefit noted when entire cohort included.

No, authors do not have interests to disclose

26 BMI Is Negatively Related to Initial Serum Lactate but Not Mortality in Emergency Department Sepsis Patients

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Study Objective: The majority of septic patients present to the emergency department (ED) as their first point of hospital contact. The early diagnosis and management of sepsis relies on a combination of clinical exam findings, patient history and disease biomarkers. Lactate is one such biomarker that is influenced by many factors. Several retrospective studies have suggested that obese individuals have reduced sepsis mortality but the impact of obesity on serum lactate and performance of lactate as a sepsis biomarker is unclear. This study seeks to determine the effect of BMI on initial lactate of ED sepsis and septic shock patients, as well as its utility as a biomarker for disease severity at an urban, quaternary care center.

Methods: A retrospective chart review model was utilized. Data was electronically extracted for patients presenting to Barnes Jewish Hospital ED between 2018-2022 with a diagnosis of sepsis or septic shock. Patients presenting in cardiac arrest, after trauma or seizure, bowel perforation or ischemia were excluded. Charts were manually reviewed to ensure appropriate ED diagnosis. Septic shock was defined as patients with concern for infection with signs of organ dysfunction and hypotension unresponsive to fluid resuscitation or requiring vasopressors. ROC were generated for lactate and 30 day mortality for the primary outcome. Group comparison between BMI < 30 and BMI ≥ 30 patients was performed for all comers as well as severe sepsis and septic shock subgroups. Multiple linear regression was performed for initial lactate to determine relative relationship to BMI and contribution of co-morbid conditions. Multiple logistic regression was performed to determine contribution of multiple factors to 30 day mortality. 30 day mortality and patient characteristics were also compared within these subgroups.

Results: Lactate performed similarly as a predictor of 30 day mortality in patients with BMI < 30 or BMI ≥ 30 with sepsis or septic shock. Lactate values of 2 and 4 had similar sensitivity and specificity regardless of BMI. BMI was negatively associated with serum lactate in all comers. This relationship was not significant in sepsis or septic shock subgroups, though it approached significance in the sepsis subgroup. Multiple linear regression of sepsis patients identified presence of cirrhosis and age as contributors to elevated lactate. There was no difference in 30 day mortality between BMI < 30 and BMI > 30 patients with either sepsis or septic shock. Consistent with these results, multiple logistic regression for mortality identified initial lactate, age and presence of septic shock as significant contributors to mortality, but not BMI.

Conclusions: Lactate performs similarly as a biomarker for sepsis severity in obese and non-obese individuals, with current lactate thresholds applicable to both groups. It also confirms prior work that initial lactate is a strong predictor of mortality in all patients presenting with sepsis. BMI did not affect mortality in sepsis or septic shock patients, contrary to some prior retrospective studies. However, we found a significant negative relationship between BMI and serum lactate in septic patients, and a positive relationship between age and initial lactate. While not enough to influence mortality outcomes, it suggests possible physiologic differences in lactate metabolism that requires further mechanistic study. There are several drawbacks of this study including retrospective design but it sets the foundation for future study into the role of metabolic disease and aging in lactate metabolism and systemic inflammatory responses.

No, authors do not have interests to disclose

27 Utilizing Machine Learning in the Classification and Diagnosis of Lung Cancer: A Novel Approach

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Background: The high mortality rates and challenges in early diagnosis of lung cancer underscore the urgent need for advancements in detection methods. The current diagnostic approaches heavily depend on CT scans, requiring analysis to distinguish between harmless and cancerous nodules. Such interpretation is crucial for determining the appropriate treatment plan. Recent research have shown the potential of artificial intelligence (AI) in revolutionizing medical imaging analysis. The utilization of machine learning models like Convolutional Neural Networks (CNNs) has shown superior performance in delineating minute details in imaging data, offering an alternative to traditional diagnostic methods.

Study Objectives: The goal of this project is twofold: firstly, to engineer a machine learning system that can accurately differentiate between benign and malignant cancers based on CT scans; and secondly, to introduce a new approach to training models that requires fewer resources and is more accessible for widespread research adoption.

Methods: We acquired 1,000 CT scans from patients with lung cancer from Kaggle.com, an open database. We organized the CT scans into separate directories depending on whether the cancer was benign or malignant. Then, we utilized Convolutional Neural Network (CNN) approaches through Google's Collaboration Platform to train the deep learning model. Lastly, we employed machine learning methods to assess the CT scans and determine whether the cancer was benign or malignant.

Results: The model was trained with a dataset of 800 images and validated with an additional set of 100 images, with another 100 images used for the final testing phase. Our results showcased precision and recall rates of 99%. The confusion matrix offers a clear depiction of the model's performance, with sensitivity and specificity calculated to be 98% and 100%, respectively. Lastly, the area under the curve was found to be 1, and the F1 score, a metric balancing precision and recall, was calculated to be 0.99.

Conclusion: Our results demonstrated precision and recall rates of 99%. This level of accuracy indicates an exceptionally high rate of true positive detections while maintaining a minimal false negative rate, which is particularly significant in the context of lung cancer diagnosis where early detection is vital. As seen in the confusion matrix, the model correctly identified 100% of benign cases, affirming the model's ability to avoid false positives that could lead to unnecessary anxiety or invasive procedures for patients. Moreover, the model exhibited a sensitivity of 98%, indicating its potential as a reliable aid in the early detection of lung cancer, which is essential for improving patient outcomes. The integration of such AI diagnostic tools could represent a paradigm shift in the early detection of lung cancer, aligning with the objectives to improve patient care as seen in previous literature. The high accuracy rate, demonstrated through both the precision-recall curve and the confusion matrix, suggests that the model has the ability to discern subtle patterns

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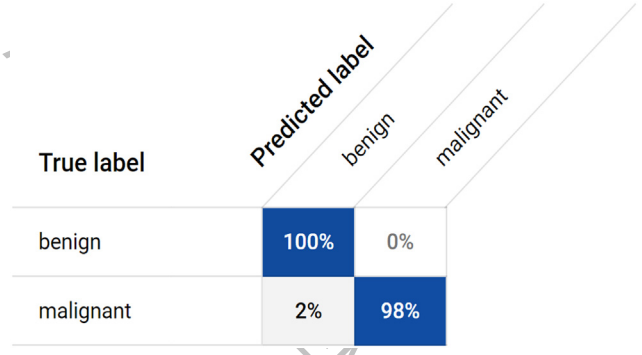
within the imaging data, patterns that may even elude the human eye. Moreover, the consistency of precision across various confidence thresholds suggests that the model can be adapted to varying clinical scenarios, offering versatility in its application. In the future, it is possible that such models would help to reduce the burden on radiologists and potentially decrease the time to treatment for patients with malignant lung nodules.



No, authors do not have interests to disclose

28 Evaluating the Utility of Pelvic Ultrasound Following a Negative CT Pelvis in Women Presenting to the Emergency Department With Abdominal Pain

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Study Objective: Evaluate the utility of pelvic ultrasound (US) performed within 24 hours after a CT of the abdomen and pelvis (CTAP) in the emergency department (ED) for finding emergent and urgent pelvic gynecological pathology in instances where CT Pelvis did not report significant findings. We hypothesize that when CT pelvis reports have no significant pelvic pathology, a subsequent emergent pelvic US will reveal no emergent pathology.

Methods: We extracted imaging reports of patients seen across 9 EDs of a large northeast health system between 2017 and 2020 who received a pelvic ultrasound within 24 hours of having a CTAP. We established criteria for determining pelvic pathology in CTAP via expert author consensus between emergency medicine and radiology physicians (Table), and used the criteria to screen out cases with abnormal CT pelvis findings. We reviewed US reports for the remaining cases to determine if pelvic ultrasound revealed any new information. Notable pelvic US findings were categorized as (1) incidental finding with no follow up needed, (2) significant finding that may need non-emergent outpatient follow up, and (3) emergent finding that may affect acute management.

Results: 1,600 cases were evaluated and 31 were excluded due to technical factors. Of the remaining 1,569 cases, 918 (58.5%) had pelvic pathology on CTAP. The remaining 651 (41.5%) patients had negative pelvic findings on CTAP. Of these 651 cases, 433 (66.5%) had US showing no new findings or incidental findings where no follow up is needed (group 1). 205 (31.5%) had US findings that may need non-emergent outpatient follow up with gynecology (group 2). 13 (2%) had US findings that could affect acute management (group 3). The 13 cases in group 3 consisted of 1 gonadal vein thrombosis case for which aspirin was started, 5 PID/salpingitis/pyosalpinx cases that required antibiotics, 5 tubal abnormalities (hematosalpinx, hydrosalpinx vs paraovarian cyst, hydrosalpinx, prominent fallopian tube, and prominent fallopian tube vs appendix) which could have but did not affect management, and 2 suspected retained products of conception (RPOC) cases, one of which was admitted for pyelonephritis with low clinical suspicion for RPOC, and the other was taken for dilation and curettage by gynecology with subsequent pathology revealing only blood clots. Negative predictive value of a negative CT Pelvis for emergent pathology (group 3) was 98%. Also, looking at the broader dataset of 1569 cases, no cases of TOA or torsion suggested on US were missed when using the criteria in table 1 to determine if US was needed.

Conclusion: US of the pelvis within 24 hours following a negative CT of the pelvis is unlikely to change ED or surgical management in the acute setting.

Table 1: Screening Criteria for Defining CTAP as Normal vs. Abnormal with Regards to Pelvic Structures

Abnormal CTAP pelvic findings

1. Emergent pelvic US evaluation or gynecological consult recommended in CTAP read unequivocally to further evaluate abnormal or indeterminate finding.
2. Hemorrhagic or ruptured cyst, regardless of size
3. Any ovarian cyst ≥ 4 cm*, with higher risk of torsion
4. Malpositioned IUD
5. Moderate or larger free fluid
6. Complex free fluid
7. Complex cyst, dermoid cyst
8. Uterine fibroids, myomas, leiomyomas, bulky uterus with unclear etiology, uterus with asymmetric prominence
9. Adenomyosis
10. Abnormal structure in pelvis, not characterizable on CT or noted to be abnormal finding of unclear significance
11. Hydrosalpinx
12. TOA, pyosalpinx, salpingitis or PID on differential for abnormal finding
13. Ovarian torsion on differential
14. Endometrial polyp or other mass, dilated canal with fluid, abnormal endometrial thickening, endometrial fluid in post-menopausal female, air in endometrial or cervical canal in absence of pelvic instrumentation
15. Pelvic masses
16. Endometrioma
17. Pelvic congestion syndrome

Normal CTAP findings

1. Trace, minimal, or small pelvic free fluid**
2. Nabothian cysts**
3. Ovarian follicles <4 cm*
4. Corpus luteal cysts <4 cm* (as long as not noted to be complex, hemorrhagic, or with signs of rupture)
5. Simple ovarian cysts <4 cm*
6. Small or trace free fluid in endometrial canal in menstruating or premenopausal female
7. Paraovarian or exophytic cyst <4 cm*

*If adnexal cyst size was not given, size was assumed to be small (< 4cm). If adnexal cyst or pelvic mass size was given, the largest size dimension was used for size cut offs.
**These findings were also characterized as normal findings on US

No, authors do not have interests to disclose

29 Host-Protein Test Impact on Antibiotic Prescription Rates in Adults With Suspected Lower Respiratory Tract Infection

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Study Objectives: Determining infection etiology is often challenging in adults presenting with symptoms of lower respiratory tract infection (LRTI). MeMed BV® (MMBV), is an FDA-cleared host-protein test to differentiate bacterial and viral infection, with sensitivity and specificity of >90%, and a negative predictive value of 99%. Here we assess the impact of MMBV on unwarranted antibiotic prescription in adult patients with suspected LRTI.

Methods: This is a sub analysis of the pre-implementation phase of the prospective, multi-center, randomized controlled JUPITER trial (NCT05762302). After informed consent, adult ED/Urgent Care (UC) patients with clinical suspicion of LRTI, for whom the physician was considering antibiotic treatment, were enrolled. Inclusion criteria required fever within 7 days and at least one of cough, sputum production, dyspnea, or auscultation abnormality. Patients were excluded if they received antibiotics before presentation or were immunosuppressed. Patients were randomized to standard of care or an intervention arm where physicians received the MMBV result. This sub analysis focused on patients for whom complete blood counts (CBC) and/or chest X-ray (CXR) were ordered (indicative of diagnostic uncertainty) and discharged. The primary endpoint was the difference in antibiotic prescription between the arms.

Results: Of 260 patients, 160 were eligible for this sub analysis. Eligible patients were from 11 sites, there were 72 in the control and 88 in the MMBV arm. Median (IQR; interquartile range) age was 41 (30-60) years, with 55% female. 94% were enrolled in the ED and 6% in UC. Discharge diagnoses included influenza (21%), upper respiratory tract infection (17%), viral infection (17%) and pneumonia (9%). Antibiotic prescription rates were 36% (95% CI: 26%-48%) and 26% (95% CI: 18%-36%) in the control and MMBV arm, respectively, representing a relative reduction of 28% (95% CI: [-55%, 15%], p=0.087). In patients with potentially unwarranted antibiotic prescription (those with MMBV≤65, ie, not a bacterial result, n=125), antibiotic prescription rates were 33% (95% CI: 22%-47%) in the control arm and 13% (95% CI: 7%-23%) in the MMBV arm, respectively; relative reduction of 62% (95% CI: [-81%, -22%], p=0.003). Of those with MMBV≤65 and complete follow-up data (95/125), only 2/43 (4.7%), and 2/52 (3.8%) patients in the control and MMBV arms, respectively, met the adverse event outcome of return ED visits within 7-days, reflecting an absolute reduction of 1% (95% CI: -11%, 8%).

Conclusion: MMBV availability is associated with a reduction in potentially unwarranted antibiotic prescription, without changes in the adverse event rates.

This project has been supported in part with federal funds from the Department of Health and Human Services; Administration for Strategic Preparedness and Response; Biomedical Advanced Research and Development Authority (BARDA), under contract number 75A50123C00041.

Figure 1 MMBV test results, their interpretation and an accompanying recommendation provided to physicians with the test results.

MeMed BV® Score	FDA indication for use (Etiology)	Recommendation
0 ≤ score ≤10	Viral infection (or other non-bacterial)	Strongly consider **not** prescribing antibiotics
10 < score <35		
35 ≤ score ≤65	Equivocal	Continue with routine care
65 < score <90	Bacterial infection (or co-infection)	Consider prescribing antibiotics
90 ≤ score ≤100		Strongly consider prescribing antibiotics

No, authors do not have interests to disclose

30 Point-of-Care Ultrasound by Emergency Physicians for the Diagnosis of Ectopic Pregnancies: How Good Are We?

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Study Objectives: Identification of an intrauterine pregnancy (IUP) on point-of-care ultrasound (POCUS) is a skill integral to the practice of Emergency Medicine (EM). Additionally, POCUS performed by emergency physicians plays an important role in the evaluation of patients presenting with signs and symptoms concerning for ectopic pregnancies. Ectopic pregnancy accounts for 2% of all reported pregnancies and is a leading cause of morbidity and mortality in the first trimester. The objective of this study is to determine the performance characteristics of emergency physician-performed POCUS in the diagnosis of ectopic pregnancy in the emergency department (ED).

Methods: We performed retrospective chart and ultrasound image reviews of all female patients who had POCUS performed in the ED of an urban, public hospital from April 1, 2021 to December 31, 2022. Patients with positive serum or urine pregnancy tests were included in the study. Patients beyond their first trimester by last menstrual period or sonographic dating, and those with previously confirmed IUP were excluded. Final diagnosis was determined by imaging performed by radiology or obstetrics/gynecology (OB/GYN) consults during the ED or at outpatient follow-up visits. Sensitivity, specificity, and negative predictive values of emergency physician-performed POCUS for the detection of ectopic pregnancy were calculated.

Results: Of the 315 patients included, 2.8% (9) were found to have ectopic pregnancies. 8 of the 9 identified ectopic pregnancies were located in the adnexa. 78% of operators were EM residents (88% in their second year of training or beyond), 13% attendings, and 9% fellows. 96.3% of the of the POCUS were performed transabdominally scans and 3.7% performed transvaginally. Emergency physicians screening for the absence of an IUP or other concerning findings achieved a sensitivity and specificity for the detection of ectopic pregnancy of 88.9% (95% CI, 51.2 – 99.7%) and 73.5% (95% CI, 68.2 – 78.3%), respectively. The negative predictive value was 99.6% (95% CI, 97.3 – 99.9%). The sensitivity and specificity of EM-performed POCUS for the detection of an IUP was 86.7% (95% CI, 82.0 – 90.6%) and 100% (95% CI, 93.2% - 100%), respectively.

Conclusion: Emergency physician-performed POCUS is valuable and important adjunct tool in the evaluation of patients presenting to the ED with findings concerning for ectopic pregnancy. Despite most POCUS examinations being performed by EM providers beyond their first year of training, 10% of IUPs were not identified requiring additional imaging and none correctly identified an ectopic pregnancy. Further education is needed for emergency physicians on the identification of an IUP and ectopic pregnancy on POCUS and possible education in obtaining a pelvic ultrasound transvaginally given the small number of studies using transvaginal ultrasound.

No, authors do not have interests to disclose

31 Clinical and Imaging Predictors of Need for Emergent Surgical Intervention for Small Bowel Obstruction

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Study Objectives: Operative management is indicated for patients with small bowel obstruction (SBO) who fail conservative therapy; however, the urgency of surgery is case- and surgeon-specific. While computed tomography (CT) is the gold standard for diagnosing and guiding surgical management, practice variation exists in identifying surgical candidates due to lack of specific radiographic findings that indicate need for emergent intervention. Here, we aim to identify clinical and imaging predictors of emergent surgical management for SBO.

Methods: We performed a multicenter, retrospective review of adults (>18 years) presenting to 10 academic and community emergency departments with a diagnosis in the SNOMED-CT grouping for SBO (281255004) from 2017 to 2020. Cases without confirmed SBO were excluded. CT was used as gold-standard to confirm the diagnosis of SBO. Variables from patients' medical history, clinical symptoms, vital signs, physical exam, laboratory values, and CT imaging were reviewed. Statistical analyses included chi-square for categorical values, logistic regression for continuous variables, and least absolute shrinkage and selection operator modeling. Logistic regression and random forest models were used to generate receiver operating characteristic (ROC) curves comparing the performance of clinical and imaging variables to clinical variables alone in predicting need for surgical intervention within 24 hours of presentation.

Results: In total, 4,478 cases were identified. Overall, 463 (10.3%) cases required surgical management within 24 hours of presentation, 112 (2.5%) within 24-48 hours, and 387 (8.6%) at >48 hours during admission. On univariate analysis, physical exam findings such as rebound tenderness (OR 6.13, 95% CI 4.04-9.21), tap tenderness (5.44, 3.89-7.54), and guarding (4.28, 3.29-5.54) were highly predictive of need for emergent surgical management within 24 hours. CT imaging findings such as closed loop obstruction (11.9, 9.28-15.3), bowel wall hypoenhancement (9.64, 6.13-15.2), and findings of an internal hernia (7.72, 5.77-10.3) were most predictive of need for emergent surgery within 24 hours on univariate analysis. Despite this, a model combining multiple clinical findings achieved similar performance compared to a model combining both CT imaging and clinical findings in predicting need for emergent surgery within 24 hours when constrained only to patients with a history of prior SBO (Figure).

Conclusion: Clinical markers alone may predict need for emergent surgery for SBO as accurately as when combined with CT imaging findings. Integrating alternative imaging modalities such as point-of-care ultrasound with clinical markers may be utilized to both make the diagnosis and risk stratify patients potentially needing emergent surgery. Further work to weigh specific clinical features may obviate the need for unnecessary CT imaging for SBO.

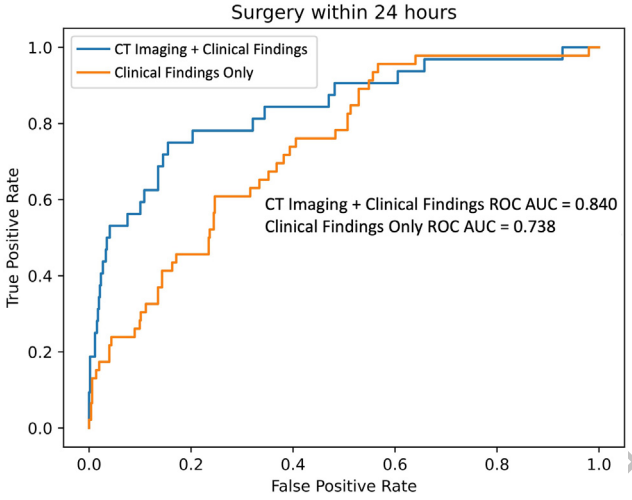

Figure. ROC curves comparing the performance of a model combining both CT and clinical findings (blue) to a model including only clinical findings (orange) in predicting need for emergent surgical intervention within 24 hours of presentation.

No, authors do not have interests to disclose

32 Machine Learning Prediction of Positive Urine Cultures in an Academic Pediatric Emergency Department

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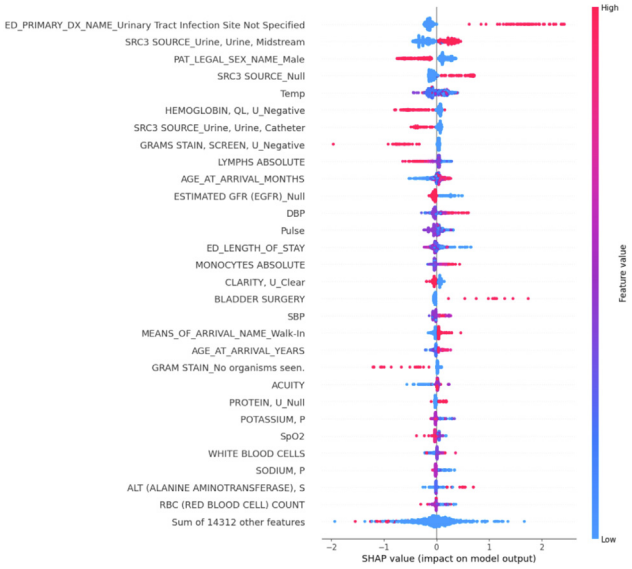
Study Objectives: Pediatric urinary tract infections (UTI's) are among the five most common causes of pediatric infection seen in the pediatric emergency department (ED). The gold standard for diagnosis is urine culture. However, results are often not available for multiple days, which can cause delayed, or unnecessary treatment with antibiotics. Many individual factors are known to be predictive or positive culture, but perfectly weighted consideration of all relevant information is not always feasible task in the ED. The objective of this study is to create a machine learning (ML) model that can utilize electronic health record (HER) information to predict urine culture positivity during an emergency department encounter.

Methods: ED encounters for an academic pediatric emergency department in the Midwest for patients greater than 3 months and less than or equal to 18 years old from the year 2020 through 2023 were analyzed. Negative cultures were defined as "No Growth" on urine culture or had descriptors that represented a contaminant. All others were considered positive. Only urine cultures ordered in the emergency department were considered. Patients less than or equal to 3 months old were excluded. Patient and ED encounter specific variables used to make the prediction include age, sex, mean of arrival, ethnicity, race, chief concern, acuity (ESI), primary diagnosis, ED diagnosis list, ED disposition, ED length of stay and disposition. Labs utilized to make the predictions include complete blood count, basic and comprehensive metabolic panels, urinalysis, point-of-care urinalysis, viral swabs, GI pathogen panels, inflammatory markers (ESR/CRP), procalcitonin, pregnancy test (urine and blood), ethanol levels, lactate, beta-hydroxybutyrate, hemoglobin AIC, creatinine kinase and ammonia. Vital signs, patient surgical and past medical history at the time of the encounter were included. Patient and ED characteristics were combined with lab results to make predictions. Categorical variables were one hot encoded for the machine learning model. The data set was split into 80% train and 20% test set. Several machine learning classifiers were fit including logistic regression, k-nearest neighbors, Extreme Gradient Boosting (XGBoost) classifier, and a deep neural network. Evaluation metrics include precision, recall, f1-score, accuracy and area under the receiver operating curve (AUC) curve. Mean Shapley Additive ExPlanations (SHAP) utilizing a game theory were calculated to understand factors the model utilized to make the predictions.

Results: 49,507 encounters were identified and of these, 3,788 (7.65%) had a urine culture ordered. A total of 1,800/3,788 (47.52%) were positive, and 1,988/3,788 (52.48%) were negative. The top 30 predictive features are provided in a summary plot and table. The XGBoost classifier performed with an AUC of 78.09%, precision of 71.31%, recall of 69.34%, F1 score of 70.31%, and accuracy of 72.03%. The most important features for making the classification include clinical diagnosis of urinary tract infection, urine source, gender, temperature, urine characteristics, gram stain, age, pulse and blood pressure, history of bladder surgery among others.

Conclusion: Machine learning methods have the potential to assist providers in the prediction of positive urine cultures in pediatric patients, aiding the decision to start empiric antibiotics. Further research is required to optimize this and evaluate the utility in broader emergency medicine settings.

Figure 1: Top 30 Predictive Features by Shap Value



No, authors do not have interests to disclose

33 WITHDRAWN

34 Educational Mentorship Program for Underrepresented Minority First-Year Medical Students to Increase Interest and Improve Skills for Acute Care Clinical Rotations

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Background: Harbor-UCLA is a safety net hospital aimed at providing the highest level of care for underserved patients. The majority of patients at Harbor-UCLA are Black or Latino, which are currently not represented by our physician demographics. There is evidence that racially concordant care can improve clinical outcomes, and therefore there is a necessity for more, highly trained Underrepresented in Medicine (URiM) physicians in acute care settings. Many UriM students identify as first generation in medicine/college and therefore often lack financial or generational support from their families which can be an isolating and difficult experience. The AIM program is geared towards bridging the knowledge gap and offering hands-on training and exposure prior to clinical rotations. We would like to prepare and empower students to be successful in their clinical rotations, as well as provide mentorship and early exposure to acute care fields.

Study Objectives: Empower and inspire UriM students to go into acute care fields like Emergency Medicine. Enhance clinical evaluations by educating them on the hidden curriculum and training them in the soft skills necessary to be successful in acute care fields. Equip and empower students to proficiently perform basic procedures during their clinical rotations. Increase rates of students successfully matching into acute care fields.

Methods:

Population: This program is a collaboration between the General Surgery and emergency department and has been ongoing for the past 3 years. This year the Acute Inpatient Mentorship (AIM) program enrolls 55 MS1 students from Charles Drew University (CDU) and 26 MS1 students from CDU-UCLA. Our 82 mentors, consisting of residents, fellows, and attending physicians, offer invaluable guidance across different departments including emergency medicine, general surgery, anesthesia, OB/Gyn, plastic surgery, neurosurgery, critical care, and more. All UriM students are eligible to participate in AIM and there are no exclusion criteria.

Design and Application: Students undergo a year-long program with bimonthly educational sessions focusing on both the hard and soft skills necessary to be successful in acute care fields. Students will also participate in monthly 2-hour shadow sessions

with their assigned mentor. Afterwards, students will apply the skills they learned in AIM during their MS2 clinical rotations.

Data Collection: During the program, pre and post-session surveys are administered for each bimonthly educational session. Soft skills are evaluated through surveys gauging participants' comfort levels across various topics using Likert scales. Hard skills, such as laceration repairs, scrubbing in, and intubations,l undergo evaluation by a trained observer utilizing a specific rubric to determine competency levels. Following the course's conclusion, students will be provided with a survey aimed at gauging their overall satisfaction with the program and evaluating their preparedness for acute care clinical rotations. Subsequently, upon completing their initial 3 months of clinical rotations, a follow-up survey and evaluation review will be done to ascertain the program's impact on their performance and success in clinical settings.

Results: Students endorse an increase in confidence and feel empowered in the soft skills crucial for success in their acute care clinical rotations. Students developed proficiency in essential hard skills necessary for their acute care clinical rotations, including laceration repairs, scrubbing in, and more. As a result of participating in the AIM program, graduating UCLA-CDU students are expected to achieve higher rates of matching into acute care fields.

Conclusion: The AIM program helps first-year UriM medical students be prepared for acute care clinical rotations. This program has the ability to be adapted at different institutions to encourage UriM students to enter acute care fields like Emergency Medicine.

No, authors do not have interests to disclose

35 Impact of Physician Assistants and Nurse Practitioners on Emergency Medicine Resident Clinical and Procedural Education

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Study Objectives: The clinical learning environment for emergency medicine (EM) residents is often complex and may be influenced by the presence of students, off-service residents, fellows, and non-physician practitioners. The American Council for Graduate Medical Education (ACGME) highlights that the presence of other learners and care providers must enrich EM resident education. This study aims to quantify the impact EM physician assistants (PAs) and nurse practitioners (NPs) on EM resident clinical and procedural education.

Methods: We surveyed Emergency Medicine Residents' Association (EMRA) Program Representatives at the 2022 American College of Emergency Physicians Scientific Assembly, the 2023 Council of Residency Directors in EM Academic Assembly, and via email between October 2022 and April 2023. Respondents were asked about the demographics of their emergency department (ED) and residency, the role of EM PAs and NPs at their primary training site, and the impact of EM PAs/NPs on EM resident education at their primary training site.

Results: One hundred ten responses were received. When multiple responses were submitted by representatives from the same program, the first response was included for analysis. Analysis was performed on 84 programs. Most respondents (89%) worked in an ED that utilized PAs/NPs. EM PAs/NPs worked in areas spanning all levels of acuity while EM residents worked simultaneously: 50% reported PAs/NPs in triage, 80% reported PAs/NPs seeing Emergency Severity Index (ESI) -4 and -5 patients, 51% reported PAs/NPs managing ESI-3 patients alongside EM residents, and 25% reported PAs/NPs managing ESI-1 and -2 patients alongside EM residents. Fifty-one respondents (63%) reported that EM residents frequently get priority over PAs/NPs for patient selection; 17 (21%) reported sometimes getting priority; 4 (5%) reported rarely getting priority, and 9 (11%) reported never getting priority. Sixty-five respondents (81%) reported that EM residents frequently get priority over PAs and NPs for procedures; 10 (13%) reported sometimes getting priority; and 5 (6%) reported never getting priority. Table 1 highlights procedures reported as regularly performed by EM PAs/NPs while EM residents worked simultaneously, cross-referenced with ACGME EM residency procedure requirements. Eight respondents (10%) reported that EM residents supervise EM PAs/NPs performing procedures, and eight (10%) reported that EM residents take presentations from EM PAs/NPs, with ultimate supervision by the EM attending. Four program representatives (5%) reported that EM PAs/NPs supervise EM residents performing procedures, and two (2%) reported that EM PAs/NPs take presentations from EM residents, with ultimate supervision by the EM attending. Twenty-seven respondents (32%) reported that EM PAs/NPs never enrich EM resident education, 27 (32%) reported they rarely enrich education, 25 (30%) reported they sometimes enrich education, and two (2%) reported they always enrich education. Twenty-one (25%) respondents reported that EM PAs/NPs never interfere with EM resident education, 37 (44%) reported they rarely interfere with education, 21 (25%) reported they sometimes interfere with education, and two (2%) reported they always interfere with education. While sixty-nine respondents (82%) reported they would feel comfortable bringing concerns to their program director about the impact of EM PAs/NPs on EM resident education, five respondents (6%) would not feel comfortable.

Conclusion: There is significant overlap between PA/NPs and EM residents working in academic EDs. While EM residents frequently are prioritized educationally, this is not always the case.

Table 1: Procedures performed by EM PAs/NPs while EM residents were working simultaneously, cross referenced with ACGME procedure requirements for EM residency.

Procedure	Responses	Percent of Responses	ACGME Requirement
No procedures by PAs/NPs	31	37	--
Bedside Ultrasound	21	25	--
Fracture/Joint Reduction	17	20	10 (Joint reduction)
Ultrasound-Guided Peripheral IV	16	19	--
Adult Medical Resuscitation	15	18	45
Lumbar Puncture	15	18	15
Arthrocentesis	15	18	--
Peritonsillar Abscess Drainage	11	13	--
Endotracheal Intubation – Adult	7	8	35 (All types of intubation)
Central Venous Access	7	8	20
Cardioversion	7	8	6
Arterial Line	5	6	--
Ultrasound-Guided Regional Anesthesia	4	5	--
Chest Tube	2	2	10
Endotracheal Intubation – Pediatric	1	1	--
Vaginal Delivery	1	1	10
Neurocritical Care	1	1	--
Endotracheal Intubation – Neonate	0	0	--

No, authors do not have interests to disclose

36 Pediatric Code Cart Training: Can Augmented Reality Improve Pediatric Readiness for Emergency Medicine Residents

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Background: Pediatric resuscitations are high-stakes, low-frequency events that require emergency physicians to be familiar with equipment that may be seldom used. Color-coded, weight-based organization systems for pediatric resuscitations facilitate retrieval of correctly sized equipment in hospital code carts. Multiple barriers to education including safety concerns about opening the "real" code cart to look at its contents require creative alternatives to learning without the risk of interfering with patient care.

Study Objectives: 1) Develop an augmented reality (AR) application to provide interactive education about the pediatric code cart, 2) Compare the effectiveness of AR-based training with static video-based instruction to improve knowledge and familiarization in EM residents of critical pediatric code equipment, 3) Investigate the impact of static vs AR application instruction on EM resident performance in a simulated pediatric emergent intubation

Methods: This was a study of EM residents of a 4-year program at a large academic teaching hospital during the academic year 2022-2023. The authors collaborated with Jump Simulation (jumpsimulation.org) to develop a mobile Augmented Reality (AR) application replica of the institutional pediatric code cart used in our emergency department. All participants completed a baseline assessment in which the participant located airway equipment from the institutional pediatric code cart for a simulated emergent pediatric intubation. We block-randomized based on training year to static instruction with a 5-minute cart review video or the mobile AR application. We reassessed participants at 3 and 6 months using scenarios with differing patient ages. Our primary outcome was time to intubation, a measure of the time to navigate and obtain equipment from the code cart. Our secondary outcome was time to estimate the weight of the simulated

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patient. The mean and standard deviation for each outcome measure were calculated by the randomized group and assessment period. We further evaluated the difference (baseline to second, second to final assessment) in each of the outcome variables between 2 intervention arms (App vs Video group) by student t-test. Linear mixed effect regressions were applied to evaluate the difference in changes of the outcome by App vs Video group, from baseline to second assessment, then second assessment to third assessment. P<0.025 was considered statistically significant with consideration of multiple comparisons in each primary and secondary outcome. R statistical programming language, version 4.2.2 was used for all analyses.

Results: For our primary outcome, compared to the Video group, the App training group had a 36.87 (95% CI: -27.69 to 101.35) seconds decreased change in time to intubation from baseline to second assessment, however, we noted a 20.87 (95% CI: -20.90 to 62.65) seconds increased time to intubation from second assessment to third assessment, although neither was statistically significant (p=0.258, p=0.322). Our secondary outcome of time to weight estimation, participants with App training had 21.08 (95% CI: 7.53 to 34.65) seconds decreased change in time for weight estimate from baseline to 2nd assessment, which was statistically significant (p=0.003). The App training group saw a further improvement in time for weight estimate from second assessment to third assessment with a 1.05 (95% CI: -14.61 to 12.51) second decrease, however, this was not statistically significant (p=0.877).

Conclusion: This project determined an AR application was feasible, providing a mobile option for learners to increase their code cart familiarity outside of the hospital setting. There was a significant difference with faster times to estimate weight in the experimental group with the novel AR instruction. There was improved performance in the simulated pediatric emergent airway scenario, with faster times to intubation facilitated by more efficient navigation of the code cart in the experimental group with the novel AR instruction on the second assessment, though not significant.

Pediatric Resuscitation – Peds Cart Project

Table 1: Participants characteristics at Baseline

	Total N = 41	App N=18	Video N=23
Gender, n(%)			
Male	20 (48.8%)	9 (50.0%)	11(47.8%)
Female	21 (51.2%)	9 (50.0%)	12 (52.2%)
Experience (years), n(%)			
0	15 (36.6%)	4 (22.2%)	11 (47.8%)
2	13 (31.7%)	8 (44.5%)	5 (21.7%)
4	13 (31.7%)	6 (33.3%)	7 (30.5%)
Level of Residency, n(%)			
R1	8 (19.5%)	2 (11.1%)	6 (26.0%)
R2	10 (24.4%)	3 (16.7%)	7 (30.5%)
R3	12 (29.3%)	6 (33.3%)	6 (26.1%)
R4	11 (26.8%)	7 (38.9%)	4 (17.4%)

Table 2. Comparisons of the participants' characteristics by App and Video Group

a) Changes of Primary and Secondary Outcomes from Baseline to 2nd Assessment, by App and Video Group

	App Group (n=18)			Video Group (n=23)			Difference in Improvement (a-b)		
	Baseline	2nd assessment	Difference (a)	Baseline	2nd assessment	Difference (b)	Estimate	95% CI	P value
Primary Outcome									
Time to start of the intubation (seconds), Mean ± SD (n)	292.97 ± 95.05 (18)	168.22 ± 48.98 (18)	-124.75 ± 81.57 (18)	281.55 ± 97.25 (22)	193.72 ± 71.22 (23)	-88.07 ± 117.15 (22)	-36.87	-101.35, 27.69	0.258
Secondary Outcomes									
Time for weight estimate (seconds), Mean ± SD (n)	52.00 ± 25.31 (18)	32.92 ± 12.93 (18)	-19.08 ± 21.98 (18)	35.77 ± 23.88 (23)	36.80 ± 26.83 (23)	2.00 ± 21.36 (23)	-21.08	-34.64, -7.53	0.003

Changes of Primary and Secondary Outcomes from 2nd assessment to 3rd Assessment, by App and Video Group

	App Group (n=18)			Video Group (n=23)			Difference in Improvement (a-b)		
	2nd assessment	Final assessment	Difference (a)	2nd assessment	Final assessment	Difference (b)	Estimate	95% CI	P value
Primary Outcome									
Time to start of the intubation (seconds), Mean ± SD (n)	168.22 ± 48.98 (18)	165.00 ± 64.25 (15)	-4.77 ± 44.81 (15)	193.72 ± 71.22 (23)	173.26 ± 57.45 (19)	-29.45 ± 73.74 (19)	20.87	-20.90, 62.65,	0.322
Secondary Outcomes									
Time for weight estimate(seconds), Mean ± SD (n)	32.92 ± 12.93 (18)	33.47 ± 18.71 (15)	2.20 ± 17.82 (15)	36.80 ± 26.83 (23)	39.76 ± 21.38 (19)	2.13 ± 21.84 (19)	-1.05	-14.61, 12.51	0.877

No, authors do not have interests to disclose

37 Decreasing Residency Administrative Burden Through Structured Automation of Summative Evaluation Requests

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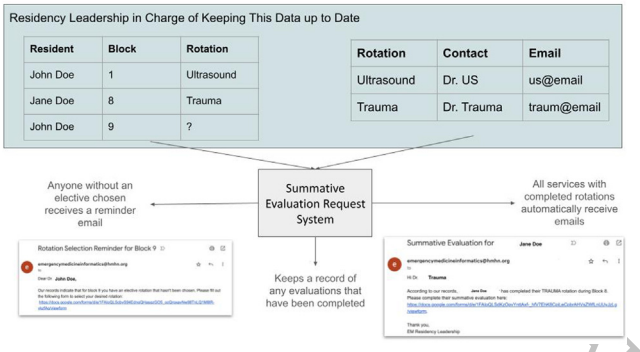
Study Objectives: The ACGME requires that residents receive an evaluation at the completion of each rotation "in a timely manner." There is limited literature on completion rates or timeliness of end-of-rotation evaluations for residents. One study looked at 418 evaluations, finding that 82% were completed, 63% within one month, 22% between 1-2 months, and 1% after 2 months. Aside from the lagged completion time, there is also an issue of administrative burden on the residency leadership team. The team must remind each rotation supervisor of the need to evaluate and must keep track of which evaluations are still in need of completion. To alleviate this burden and create a more streamlined process for end-of-rotation evaluations, an automated system was constructed (Figure).

Methods: Residency leadership is expected to keep an updated list of two things: a) which resident is doing which outside rotation during which block, b) list of supervisors for each rotation and a link to each rotation evaluation form. Given these items, the system checks the date and at the end of any given block automatically: 1) sends out personalized emails to each rotation supervisor, including the specific form requiring completion and for which resident; 2) for rotations where the corresponding attending is variable, the individual resident is emailed and asked to identify which supervisors they worked with. Then, those identified receive an invitation to fill out the evaluation; 3) Any resident who doesn't have an elective picked out for a future block receives an automated email asking them to choose a rotation; 4) updates the list of which evaluations have been completed, and which are still outstanding. To assess whether the system made any difference in the time-to-evaluation completion, we conducted a retrospective review of the evaluations from before the system implementation (pre) and after (post). To assess whether the system had a statistically significant difference on completion time, a t-test was conducted.

Results: Comparing summative evaluation completion times prior to our intervention (AY2223) to after the intervention (beginning in 8/23), we found a statistically significant difference in the number of days it took for an evaluation to be completed (t-test p-value <0.0001). In AY2223, there was a median of 34 days until evaluation completion. After the automated system was implemented, the completion time decreased to 2.5 days. The greatest reduction was in the MICU rotation from 119 to 2.5 days.

Conclusions: The automation of the summative evaluation request process has not only decreased the administrative burden on residency leadership but also led to more timely evaluations being delivered to each resident. As we believe that more timely evaluations lead to more thoughtful, comprehensive, impactful, and actionable evaluation responses, we aim to study the quality of evaluations in future work.



No, authors do not have interests to disclose

38 Finger-to-Nose Test to Improve EMS Pre-Hospital Recognition of Posterior Stroke

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Background: Accurate and timely recognition of posterior circulation strokes is critical in emergency medical settings. The symptoms of such presentation are non-specific and challenging for Emergency Medical Services (EMS) providers to recognize in the pre-hospital setting.

Study Objectives: The aim of this study is to determine if the finger-to-nose (FTN) test improves EMS pre-hospital recognition of posterior stroke and to validate the FTN test as a diagnostic screening tool.

Methods: A retrospective cohort design was used for the control group with data collected from March 2021 to March 2022 from a rural EMS service agency in the upstate region of South Carolina transporting to various stroke centers within a single large hospital network. Pre-hospital providers were then trained to perform and interpret the FTN test in February 2022 and continued education during in-service training during the months of March, May, and June to ensure that all EMS providers were educated. Following FTN training, a prospective cohort was used to assess posterior stroke recognition rates from March 2022-March 2023.Data were collected from the Get With The Guidelines stroke registry and manual chart review of neuroimaging to verify posterior circulation strokes.

Results: From March 2021 to March 2022, total of 206 stroke patients with 46 posterior circulation strokes were transported. From March 2022- March 2023, the same agency transported 182 stroke patients with 24 posterior circulation strokes. Recognition rates of posterior strokes were initially observed at 44% in the control group, mirroring baseline data, and increased to 72.7% in the training group. Sensitivity and specificity of the FTN test were measured, showing results of 73.7% and 72.1%, respectively. The enhanced training group demonstrated a significant improvement in the recognition of posterior strokes compared to the control with a $p < 0.01$.

Conclusion: This study showed the improvement in recognition of posterior strokes among prehospital healthcare providers with FTN training, highlighting the importance for the integration of specialized training programs for pre-hospital providers.

No, authors do not have interests to disclose

39 Assessing the Impact of Language Barriers in Prehospital Care: Interpretation Use and Pain Management in PLOE Patients

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Study Objectives: Despite being a growing population in the United States, patients who prefer a language other than English (PLOE) experience inequities in their medical care. While in part due to federal requirements, most hospitals and health systems have language access policies and required interpretation use, there is heterogeneity in how emergency medical services (EMS) navigate language barriers. Research in hospital and ambulatory settings has demonstrated that interpretation use is associated with improved outcomes and reduced costs. However, its usage and impact in the prehospital setting are less understood. The aim of this study is to describe the prevalence of prehospital patients with PLOE and examine the impact language barriers have on their medical care and its association with patient race. Additionally, this study seeks to determine the prevalence of interpreter use and explore its relationship with pain screening and pain medication administration.

Methods: We conducted a cross-sectional, retrospective study that included all advanced life support transported prehospital adult trauma patients from 2015 to 2021 in Portland, Oregon, focused on two outcome measures: pain screening and pain medication administration. Multiple researchers independently identified patients with PLOE (kappa = 0.96) and interpreter utilization (kappa = 0.80) through both barriers to care indications and narrative free text identification. We used bivariate and multivariable logistic regression models to compare outcomes between PLOE and English proficient patients while also examining the association between PLOE and racial treatment inequities.

Results: In our sample of 50,162 patients with traumatic injuries, 2% (998) were identified as patients with PLOE and 54% of them did not receive any form of language interpretation. PLOE patients were more likely to be female, a racial or ethnic minority, and not have health insurance. In multivariable models adjusted for demographic and clinical characteristics, patients with PLOE were 60% less likely to receive a pain screening (aOR 0.40, 95% CI 0.35-0.46), compared to English speaking patients. Patients with PLOE that did not receive any form of language interpreter were 30% less likely to receive a pain screening (aOR 0.70, CI 0.54 – 0.92) compared to those that did receive an interpreter. Language status did account for a portion of the racial treatment inequities seen in the Hispanic (33%) and Asian (18%) patients, but not for Black patients.

Conclusion: This study is the first to explore the interaction between PLOE, the use of interpretation, and the associated outcomes in pain management within US prehospital trauma settings. Patients with PLOE made up 2% of the sample and were less likely to undergo pain screening regardless of potential confounding factors such as race/ethnicity, age, gender, insurance status, and injury type. Despite interpretation being used in less than half of patients with PLOE, it was associated with improved outcomes. Critically, language status accounted for a significant portion of racial treatment inequities for Hispanic and Asian patients, but not Black patients. This evidence suggests that improving treatment equity for PLOE patients through the use of an interpreter will also reduce racial treatment inequities for Hispanic and Asian patients. These findings, among others, should encourage decision-makers at EMS agencies, including medical directors, to enhance equitable care for patients with PLOE by adopting language access policies and interpretation use.

No, authors do not have interests to disclose

40 Characterization of Online Medical Direction Calls in the Emergency Department

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Study Objectives: Although online medical direction (OLMD) calls are a crucial piece of day-to-day operations for emergency medical services (EMS), no studies have investigated the content and time spent on each call, which would ensure efficient management of critical questions and potentially enhance quality of care. This project aimed to characterize the length, time intervals, and types of OLMD calls, while introducing a feedback mechanism to improve efficiency at an individual and system level.

Methods: This IRB-approved retrospective cohort study analyzed calls placed by EMS personnel between August 1 and August 31, 2022, to the communications center of an academic level 1 trauma center in South Carolina. Two emergency medicine residents independently reviewed each call using a data extraction spreadsheet, any discrepancies were resolved through consensus. Data extracted included time to connect to physicians, time spent to arrive at clinical question, time spent discussing patient care, and total length of call. The type of calls was characterized as EKG interpretation, code termination, medication directives, and other. Descriptive statistics were used to assess the frequency of each variable and to calculate average times. T-tests were utilized to compare the differences in mean call time by type of call and the individual receiving the call.

Results: Among 91 calls analyzed, the most common were EKG-related (60.4%), followed by general medical queries (17.58%). The average total call duration was 3.01 minutes, with time to connect to a physician averaging 1.20 minutes. Most OLMD happened between the hours of 1800 to 0600 (57.14%) and advanced life support units/providers averaged 51% of the calls made. Time spent by EMS providers to arrive at clinical question averaged 42 seconds and time spent discussing patient care averaged 64.8 seconds. The amount of time spent to arrive at clinical question by EMS providers between EKG calls (37.2 seconds) was smaller than medical/other category (50.4 seconds) with p-value of 0.0452. Time spent discussing patient care was longer in the medical/other calls (127.8 seconds) than EKG calls (93.6 seconds) with a p-value of 0.0357. No statistical differences were found in the time intervals whether an attending only or resident only spoke during the call.

Conclusion: These findings were used to design interventions to reduce call durations and enhance the effectiveness of content medical directives provided to pre-hospital providers. These included the development of a scoring rubric for feedback and streamlined connection processes. Additional training was also developed to improve the efficiency of information delivery during calls. This project highlights the variability in OLMD call handling, a novel characterization of time stamps for the anatomy of OLMD. Review of OLMD calls can unveil actionable steps to improve the quality of medical direction and potentially enhance patient care outcomes.

No, authors do not have interests to disclose

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

41 Evaluation of the Use of Ketamine in Prehospital Seizure Management

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Background: Benzodiazepines have traditionally been the primary antiseizure medication (ASM) used by Emergency Medical Services (EMS) professionals for the treatment of seizures. However, about 30% of pediatric seizures and 40% of adult seizures are refractory to benzodiazepines called benzodiazepine refractory status epilepticus (BRSE). Few options exist for EMS professionals in the setting of BRSE. Ketamine is currently used by EMS for a variety of indications and offers a unique pharmacologic opportunity to treat BRSE, but little is known about the use for this indication in the prehospital setting. The goal of this study was to describe the frequency of use of ketamine for the management of seizures in the prehospital setting.

Study Objectives: The purpose of this retrospective review was to describe the use of Ketamine in the setting of seizures by EMS utilizing the National Emergency Medical Services Information System (NEMSIS) for the calendar years 2020-2022.

Methods: We reviewed the NEMSIS dataset 2020-2022 to identify EMS encounters for seizures. We identified relevant encounters using the "primary impression" field, a mandatory EMS data element, for the relevant ICD-10 codes related to seizure. We extracted demographics, ASM use (ketamine, lorazepam, midazolam, diazepam, levetiracetam) and any airway intervention. The primary outcome was the frequency of ketamine administration during EMS encounters for seizure. We analyzed the administration of ketamine with and without the presence of an airway procedure to identify encounters where ketamine was more likely to be administered for seizure management and not airway management.

Results: We analyzed 145,651,249 encounters and 1,726,127 included a primary or secondary impression related to seizure. There were 152,625 encounters where medication was administered, and no airway procedure performed. In this subgroup, a total of 3,580 (2.35 %) encounters were treated with ketamine and 1,924 (1.26%) patients received only ketamine. Of the 13,600 encounters where an airway procedure was performed, ketamine was administered 1,380 (10.15 %) times. There was an increase in ketamine use year over year during encounters for seizure (Figure 1). Additionally, we saw a relative decrease in the frequency of ketamine use during encounters with an airway procedure despite an increase in ketamine use overall (Figure 2).

Discussion: The prehospital use of ketamine for seizures is increasing over time despite a lack of rigorous clinical research to support this trend. Additionally, the results of this data analysis are consistent with prior work using the ESO dataset. Prospective research into the safety, efficacy, and feasibility of ketamine in the prehospital management of seizures is needed.

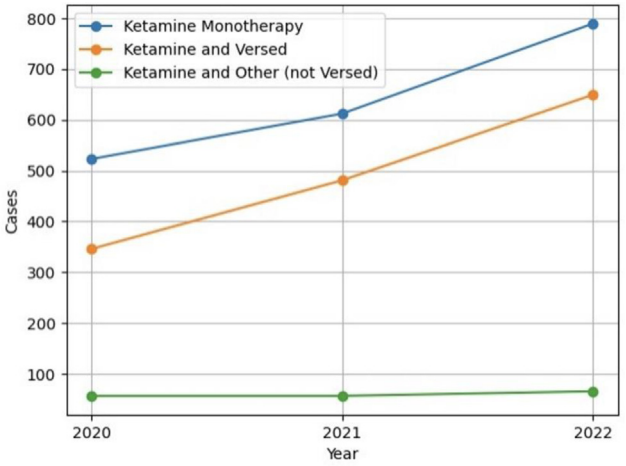

Figure 1. Ketamine use for seizures without an advanced airway from 2021 – 2022 compiled from a retrospective review of the National Emergency Medical Services Information System (NEMSIS) Database.

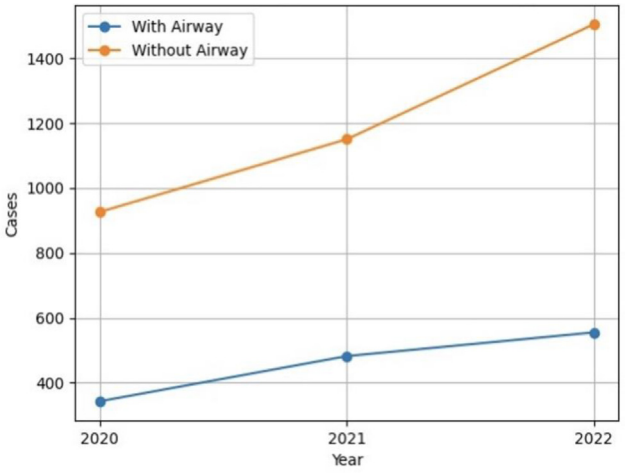

Figure 2. Ketamine use for seizures with and without an advanced airway from 2021 – 2022 compiled from a retrospective review of the National Emergency Medical Services Information System (NEMSIS) Database.

No, authors do not have interests to disclose

42 Implementation of Whole Blood Protocol in the Prehospital Setting

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Study Objectives: Blood transfusion has expanded to the prehospital setting including implementation across multi-jurisdictional emergency medical services (EMS) agencies. Research is limited on the use and feasibility of transfusion protocols in specific scenarios, such as agencies with volunteers and those transporting to Level 3 trauma centers. The goal of this study was to assess the success of a prehospital whole blood transfusion protocol in one year after implementation in a region with multi-jurisdictional EMS that employs volunteers and transports to both Level 1 and 3 trauma centers.

Methods: This was a retrospective observational study evaluating the first 99 units of whole blood administered immediately after implementation of a whole blood transfusion protocol in four EMS agencies operating under a single regional governing body council The council includes volunteer and professional providers as well as both third-service and fire-based EMS. Demographic information including patient age, sex, race, type of injury, transport destination, and survival outcome were collected for each unit of blood given. EMS on-scene and transport times were also collected.

Results: A total of 99 units of whole blood were administered under the protocol within the first 18 months. Of the patients who received at least one unit of whole blood, 78.8% (n=78) were male and 47.5% (n=47) were black. Penetrating injuries accounted for 58.6% (n=58) of cases requiring whole blood while medical causes represented 12.1% (n=12). Use of whole blood was most likely to occur on Saturdays and between the time of 6:00 pm and midnight. Patients were more likely to be transported to the regional Level 3 trauma center rather than the Level 1 trauma center, and 70.7% (n=70) survived to hospital discharge.

Conclusion: This study demonstrates the feasibility of implementing a whole blood transfusion protocol in the prehospital setting. Future studies could evaluate the effect on survival and outcomes before and after transfusion protocol utilization, outcomes of patients transported to a Level 1 versus Level 3 trauma center, and prehospital factors that improve survival to hospital discharge.

No, authors do not have interests to disclose

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43 The High Success Rate of Distal Femur Intraosseous Lines in Pediatric Patients in the Prehospital Setting

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Study Objectives: Although the proximal tibia is a common site for intraosseous (IO) line placement in pediatric patients, prior studies indicate high malposition rates in infants at this site. Given that distal femur IO lines generally demonstrate higher flow rates than those at the proximal tibia, we aimed to compare the success rates of pediatric IO line placements between these two locations in a prehospital setting.

Methods: We used data from Palm Beach County Fire Rescue to perform a retrospective chart review of prehospital pediatric patients to assess the success rate of distal femur IO line attempts as compared to IO line attempts at other locations. We searched the electronic medical records for all pediatric patients from May 2015 until January 2024 who had at least one attempt at IO line placement. We excluded patients if the documentation did not specify the location of the IO attempt. Two medical students who were trained by the principal investigator but blinded from the study hypothesis performed chart reviews. They abstracted the following data points: patient demographics, reason for the 9-1-1 call, anatomical location of each vascular access attempt, whether or not each attempt was successful, and prehospital complications of the line. The primary outcome was the success rate of IO attempts at each anatomical location. In particular, we compared the unadjusted success rates of distal femur to proximal tibia. We also used multivariable logistic regression to determine if (after adjustment for age and weight), distal femur insertion was associated with a higher success rate than proximal tibia. Secondarily, we assessed the prehospital complication rate of the IO lines at each anatomical site.

Results: We identified 163 eligible pediatric patients for whom there was a documented IO attempt in the prehospital setting. Median age was 1.9 years (IQR: 0.46 to 4.2 years). Amongst those 163 patients, there were 234 documented vascular access attempts: 82 distal femur, 72 proximal tibia, 46 intravenous, 20 distal tibia, and 14 proximal humerus. Table 1 shows the success and complication rates for each of these. Notably, the success rate for distal femur IO placement was 89.0% compared to 84.7% for proximal tibia, a difference of 4.3% (95% CI -6.4 to 15.0%). On multivariable regression analysis, attempting the IO in the distal femur had an adjusted odds ratio of 1.50 (95% 0.58 to 4.0) for successful placement as compared to the proximal tibia.

Conclusion: This retrospective analysis of pediatric patients suggests that distal femur IO might offer a marginally higher success rate compared to the proximal tibia IO in the prehospital setting. Despite not reaching statistical significance, these findings support the consideration of distal femur as a viable option for IO placement in the pediatric population.

Table 1: The number of attempts at obtaining vascular access at various anatomic sites and the associated success and complication rates for those attempts in pediatric patients in a prehospital setting.

Site	Attempts n (% of total)	Success n (% successful)	IO Complication n (% complication)
Distal femur	82 (34.9%)	73 (89.0%)	4 (4.9%)
Proximal tibia	72 (30.8%)	61 (84.7%)	3 (4.2%)
Intravenous	46 (19.7%)	9 (19.6%)	----
Distal tibia	20 (8.5%)	16 (80.0%)	1 (5.0%)
Proximal humerus	14 (6.0%)	11 (78.6%)	0 (0.0%)
Total	234 (100%)	170 (72.6%)	8 (3.4%)

No, authors do not have interests to disclose

44 Delirium Screening: Prevalence and Outcomes in Older Emergency Department Patients Across a Large Healthcare System

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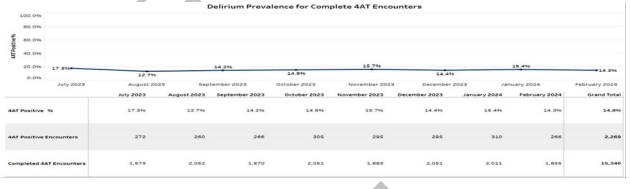
Study Objective: Delirium occurs in 10-17% of older emergency department (ED) patients and is often not recognized. We implemented an enterprise-wide ED delirium screening program for older high-risk ED patients and report delirium prevalence, patient disposition, and hospital admission length of stay (LOS).

Methods: Prospective observational study across 17 EDs in a large healthcare system from July 6, 2023, to February 29, 2024. Delirium screening was implemented in ED triage for high-risk older patients. Automated high-risk screening was performed using the electronic medical record (EMR) and defined as age ≥80y with one of the following- history of falls, dementia, polypharmacy (>ten medications), or frequent ED visits (>5 in a year); or age ≥65-79y and two risk factors. Delirium screening was performed by the triage nurses using the 4AT delirium screen and recorded in the EMR. A score of ≥4 was used to identify possible delirium. Nurses also had professional discretion to screen non-high-risk patients. A positive delirium screen resulted in an EMR alert for ED providers. Delirium prevalence rates, patient disposition, 30-day ED return rates for discharged patients and LOS for admitted patients are reported for high-risk older patient encounters. 95% CI are reported for differences in proportions and means.

Results: 127,029 older patient ED encounters occurred during the study period. 45,705 (36.0%) encounters were categorized as high-risk and qualified for delirium screening. Mean age was 83 years; 59.9% were female. 15,346 (33.6%) high-risk encounters had completed 4AT screens. 2,269 had scores of ≥4 for a delirium prevalence of 14.8%. An additional 2,174 non-high-risk patients were screened; 387 (17.8%) had a positive 4 AT screen. Delirium prevalence for high-risk patient encounters was stable during the study period (Figure). 76.8% of high-risk encounters with a positive delirium screen (≥4AT) were admitted to the hospital, while 18.1% were discharged home (with 5.1% other). Overall admit rates for high-risk encounters with a negative 4AT (<4) score was 57.1% (difference of 19.7%, 95% CI 17.9 to 21.5%, p<0.0001). 20.2% patients discharged home with a positive delirium screen returned to the ED within 30 days, compared to 16.3% of patients discharged with a negative delirium screen (difference of 3.8%, 95%CI 1.8 to 5.9, p=0.0001). Average LOS for high-risk admitted patients was 5.6 days for those with a positive delirium screen and 4.0 days for those with a negative screen (difference of 1.6 days, 95%CI 1.58 to 1.62, p<0.0001).

Conclusion: In this large prospective study, we found a 15% delirium prevalence among high-risk geriatric ED patient encounters. Although patients with delirium were more likely to be admitted, 18% were discharged home. Patients discharged home with a positive delirium screen had higher 30-day ED return rates. High-risk admitted patients with delirium had an increased hospital LOS compared to those without delirium. ED delirium screening is feasible across a large healthcare setting and may allow for delirium-specific patient care plans, safer transitions of care, and better hospital discharge planning.



Yes, authors have interests to disclose
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Other
Research supported by West Health Institute

45 What Is the Best Method to Identify Older Patients at Risk in a Geriatric Emergency Department

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Study Objectives: The rapid growth in the population aged 65 years and older will present major challenges to emergency departments (EDs) in the coming decades. Efforts to address this change include the development of accredited geriatric emergency departments (GEDs) and the use of ED nurses specially trained in geriatrics to screen and refer older patients for underlying health needs regardless

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of visit reason. However, due to resource limitations, identifying who would benefit from getting these additional services is challenging. The purpose of this study is to evaluate if existing data in the electronic health record (EHR) can be used to replace the Identification of Seniors At Risk (ISAR) screening tool to identify at risk patients.

Methods: This is a retrospective cross-sectional study at a level 1 GED (ED census 38,000) from Jan 2017 through Dec 2023, with follow-up through March 31, 2024. At this GED, vulnerable seniors that are eligible for a consultation by the specialized nurse are identified by standardized ISAR screening and Emergency Severity Score (ESI). Patients who are 65 year or older, have an ISAR >1 and ESI = 3 has an automatic consult order triggered in the EHR (EPIC) and can receive additional comprehensive screening focusing on various conditions based on the availability of the nurse. Data collected included ESI, ISAR results, chief complaint of a fall, prior inpatient discharge within 90 days, and the Charlson Comorbidity Score (CCS). Patients without a valid ISAR or ESI were excluded. A chief complaint of a fall, a prior inpatient discharge within 90 days or a CCS>6 were used to replace the ISAR to see if they could identify those at risk for an adverse outcome, specifically being admitted, or a 7, 30, or 90 ED revisit or admission. The outcomes were compared between the ISAR and non-ISAR data using a chi-square test, a p-value <0.05 were considered significant.

Results: There were a total of 108,050 ED encounters by patients 65 and older over during the study period, of which 72,795 (67.5%) had an ESI = 3. Among these patients, 22,382 (29.5%) had an ISAR score >1 and had a specialized nurse consultation ordered. When using the combination of factors, 21,455 (29.5%) were eligible for the order. When comparing disposition, 8,726 (39.0%) of the ISAR patients were admitted while 8,910 (41.5%) of the non-ISAR patients were admitted (p<0.001). For ED revisits and admissions after discharge, patients identified using the non-ISAR data were more likely to return within 7, 30, and 90 (p's<0.001). The largest difference for these measures was noted for the 90-day measure for both ED revisits and admission measures, 49.4% vs 39.2% (diff=10.3%), respectively for ED Revisits and 31.3% vs 23.3% (diff=8.0%), respectively for admissions post discharge.

Conclusion: This study showed using existing EHR data will identify a population with higher negative outcomes than using the ISAR. Introducing a screening tool, such as the ISAR, into either the triage or primary nurse workflow can be time consuming for already busy nursing staff. Being able to use existing data in the EHR to flag patients upon arrival would provide a more uniform method to identify at risk patients while using nursing resources for other tasks.

No, authors do not have interests to disclose

46 A Geriatric Emergency Department Evaluation Reduces Admissions and Decreases Hospital Length of Stay

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Study Objectives: The older adult population, age ≥ 65 years, is steadily increasing in the United States and worldwide. Older adults are presenting to the emergency department (ED) more often and with more complex medical histories and comorbidities. These patients typically are more likely to be admitted and have longer ED and hospital lengths of stay (LOS). The goal of this study is to determine if the implementation of a Geriatric Emergency Medicine Assessment (GEMA) team as part of a Geriatric Emergency Department Accreditation consisting of trained Advanced Practice Providers (APPs), Occupation/Physical Therapists (OT/PT), and Care Management members, impacts overall admission rates and hospital LOS for geriatric patients.

Methods: We investigated the impact of a GEMA team in a large tertiary care hospital ED from June 2021 to January 2023 during weekday hours, 8 a.m. to 6 p.m. The GEMA team was available to assess eligible patients ≥ 65 years who presented to the ED with an estimated severity index (ESI) of ≥ 2 during these hours. Eligible patients were screened by the GEMA team for increased risk of adverse functional outcomes and assessed for specific interventions including ED OT/PT evaluations, rehabilitation placement needs, delirium management evaluations, geriatric clinic referrals, and medication reconciliation/assessment specifically evaluating for polypharmacy. The control population included unassessed geriatric patients presenting to the ED during the study period. Inverse probability weighted (IPW) regression method was used to estimate the average assessment effects. Logistic regression generated a propensity score for each patient, which was then applied in an IPW regression to balance covariates of sex, race, ESI, Charlson Comorbidity Index, and payor type. The estimated results were reported with corresponding 95% confidence intervals (CI) and p-values for the regression analysis. All statistical tests were two-sided, and statistical significance was determined using a p-value threshold of less than 0.05. The analysis was conducted using R-4.3.1, provided by the R Foundation for Statistical Computing.

Results: A total of 50,108 patients met inclusion criteria with a mean age of 77 +/- 8.5 years. Of these patients, 7,327 patients (6.8%) were assessed by the GEMA team with 60.7% of assessed patients being female, 69.6% white. The IPW regression analysis shows that assessed patients had significantly lower odds of hospital admission (OR:0.561; 95% CI: 0.532, 0.591; P< 0.001). The assessed patient admitted LOS decreased 24.11 hours compared to unassessed patients (OR:0.185; 95% CI: -0.208, -0.161; P<0.001). ED LOS for assessed patients was slightly higher, by 34.4 minutes, than that of unassessed patients with an estimate of 0.143 (95% CI: 0.126, 0.161; P<0.001). This trend was more noticeable among admitted patients (Figure 1). Using a Kaplan-Meier survival curve, assessed patients consistently demonstrate a higher cumulative probability of discharge compared to unassessed patients (Figure 2), suggesting that assessment by the GEMA team overall is associated with a higher likelihood of discharge from the ED and earlier hospital discharges if admitted.

Conclusion: Patients assessed by the GEMA team in the ED are both less likely to be admitted to the hospital and if admitted, have an overall decreased hospital LOS. Together this supports prior research that dedicated Geriatric EDs and comprehensive geriatric assessments with subsequent targeted interventions are beneficial in reducing admissions and overall hospital LOS for geriatric patients. This has important patient care, cost savings, and hospital crowding implications.

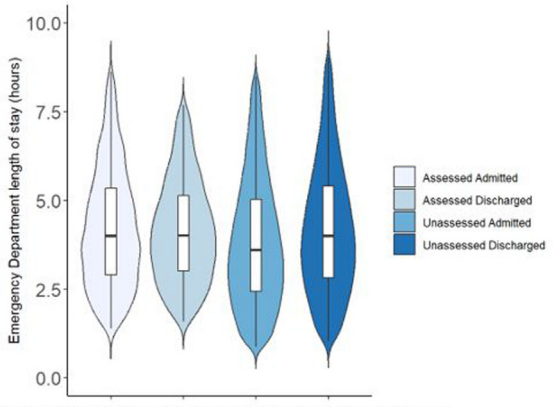

Figure 1: Violin plot showing 5th and 95th percentiles for each group.

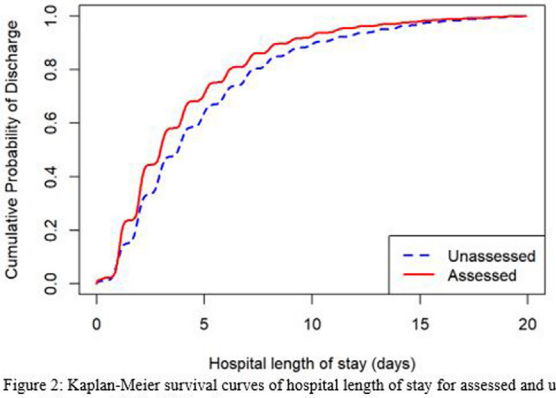

Figure 2: Kaplan-Meier survival curves of hospital length of stay for assessed and unassessed patients (censored after 20 days)

Yes, authors have interests to disclose

Disclosure: Board of Governors for ACEP Geriatric Emergency Department Accreditation

Board Member/Officer/Trustee

Board of Governors for ACEP Geriatric Emergency Department Accreditation

47 Emergency Department Intubations in Older Adults and Associated Mortality

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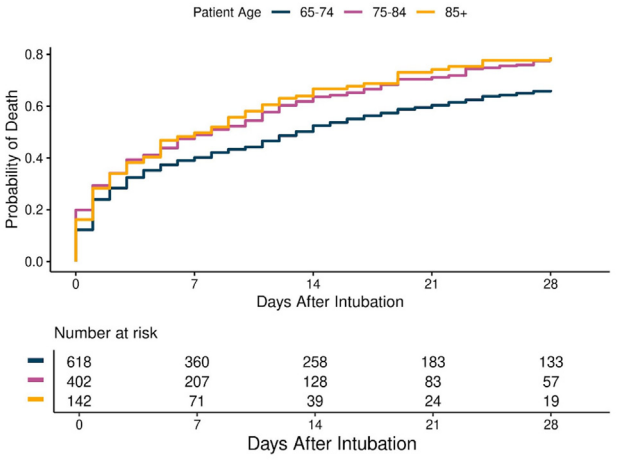
Study Objectives: Intubating older adults in the emergency department (ED) should ideally involve a comprehensive discussion of the goals of care. This study aims to describe the characteristics of emergency intubations in geriatric patients and their associated mortality rates.

Methods: This pre-planned analysis utilized data from a large, prospective, registry-based cohort study of older adults aged 65 or older who were intubated in 18 Eds across various regions of Brazil, including both academic and community centers, from March 2022 to April 2024. The study included all emergency intubations performed on patients aged 18 years and older, excluding those during cardiac arrest. Data were collected via a standardized REDCap survey completed by an observer 30 minutes after each procedure. A principal investigator from each site accessed outcomes 28 days post-intubation. Compliance with inclusion criteria was ensured by appointed case managers at each center. Centers with a compliance rate of $\leq$ 80% for any given month were excluded from that month's data. The primary outcome was 28-day mortality. Data were analyzed for procedural characteristics (such as indications for intubation, techniques, drugs used, devices, and adverse events) and patient characteristics (age, sex, comorbidities, severity of illness). Hazard ratios (HRs) with 95% confidence intervals (Cis) were calculated using univariable and multivariable analyses. A Kaplan-Meier survival analysis was conducted among different age groups.

Results: A total of 1,162 patients were included, with 618 (53.2%) aged 65-74, 402 (34.6%) aged 75-84, and 142 (12.2%) aged $\geq$ 85 years. The overall 28-day mortality was 66% (CI 63.2% - 68.7%). Older age was associated with an increased risk of death (61.0% among those aged 65-74 years, 71.6% among those aged 75-84 [HR 1.35, CI 1.16-1.58], and 71.8% among those aged 85+ [HR 1.40, CI 1.12-1.74]). Patients intubated on the first attempt had lower mortality rates (HR 0.84, CI 0.71-0.99). Similarly, patients experiencing no major complications during the procedure (no severe hypoxemia, hemodynamic instability, or cardiac arrest) were less likely to die at the end of follow-up (HR 0.72, CI 0.62-0.83). After accounting for potential confounders such as comorbidities and procedural-related characteristics, older patient age groups remained at significantly higher risk of death compared to the youngest group (age 75-84: HR 1.26, CI 1.06-1.49; age 85+: HR 1.43, CI 1.13-1.80).

Conclusion: Older patients intubated in the ED in Brazil face high mortality rates, with only 1 in 3 patients alive at 28 days. Improving first-pass success and avoiding major complications are associated with improved outcomes. These findings are intended to enhance decision-making processes, thereby improving patient and caregiver comprehension of the potential risks and setting realistic expectations for the family about the patient's outcome.

Figure 1: Kaplan-Meier cumulative incidence for patient mortality following intubation



No, authors do not have interests to disclose

48 Geriatrics Consults Can Avert Admissions in an Academic Emergency Department

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Background: Older adults represent a large portion of emergency department (ED) encounters. Older adults are at increased risk of adverse events in the six months following an ED visit including functional decline, hospitalization, repeat visits, and death. Interventions targeting this vulnerable population have been implemented at numerous centers. Geriatric Emergency Room Innovations for Veterans was developed to increase geriatric screening and care coordination at the Veterans Health Administration. The program significantly reduced ED admissions and 30-day hospital admissions without increasing ED length of stay or ED revisits within 72 hours. In another study, consultation with either a transitional care nurse or a social worker with specific geriatric training saved an average of $2,436 or $2,905 in the 30 days after an ED visit in two studied United States hospitals. Given these prior successful interventions, we sought to improve patient outcomes in an academic hospital by embedding an attending-lead geriatrics consultation service in the emergency department.

Methods: Included patients were older adults who were established with the Seniors Clinic at the University of Colorado Hospital at the time of their ED encounter. This clinic provides geriatric specialty primary care to patients 75 and older. We intervened by embedding a geriatrician in the University of Colorado ED Monday through Friday from 8 am to 5 pm. The consultant received automated notification of a Seniors Clinic patient arrival and self-initiated a consult in coordination with the ED provider team. The geriatrician conducted a focused geriatric assessment relevant to the ED visit. The consultant could interface with the interdisciplinary team to coordinate home health and close clinic follow up when indicated. The primary outcome for was change in disposition from expected admission to discharge. An expected admission was any patient whose status was entered by the ED provider as an "anticipated admission" during their ED visit which displays on the ED track board. Secondary outcomes included return to the ED within nine or 30 days, hospitalization within nine or 30 days, home health orders placed, hospice orders placed, and durable medical equipment ordered, among others.

Results: Between November 1, 2023 and April 1, 2024, 220 consults were completed. 6.8% (15/220) of consults resulted in change of disposition from expected admission to discharge home. Admission rates for patients seen by the geriatrics team in November were 25% compared to 27.7% for Seniors Clinic patients seen in the ED without a consult in the same time period.

Discussion: Given the known complications older adults face during hospitalization, any admission saved has significant implications for patient care, patient satisfaction, and costs. Our early results indicate that an attending-geriatrician-led ED consult service can improve patient outcomes by reducing admissions when

clinically reasonable. We hope to demonstrate cost effectiveness in a future program assessment to substantiate sustainability.

No, authors do not have interests to disclose

49 Exploring Current Emergency Medical Services Approaches to Manage Agitated Older Adult Patients: A Comprehensive Analysis of Statewide Protocols

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Study Objectives: Agitation in older adult patients presents unique challenges for Emergency Medical Services (EMS) providers. To safely assess, treat, and transport these patients, EMS providers must address this agitation, which is often caused by acute delirium or by behavioral symptoms of dementia. Strategies routinely used in younger patients, including chemical and physical restraints, have a much higher risk of causing harm in older adults due frailty, co-morbidities, and physiological changes. EMS provider practices in this area are under-studied, and substantial variation may exist. Given the highly protocolized nature of EMS, our objective was to examine all publicly available US state protocols for any guidance on management of agitation in older adult patients.

Methods: Through a literature review and a consensus process involving experts, we identified 24 key criteria representing best practices in managing agitated older adult patients in the prehospital setting. We found and examined 33 state protocols and a US national protocol. Each protocol was reviewed for approaches to agitated patients and assessed for adherence to the identified best practices.

Results: Among the 34 protocols analyzed, 35% included guidance specific to the management of older adults. Use of physical restraints was included in 97% of protocols examined, yet none provided modified guidance for their use in older adult patients. Use of medications as chemical restraints was mentioned in 91% of protocols, with 32% of them recommending modifying dose for older adults and 20% providing specific dosing guidance for older adults. Recommendation to escalate to online medical control (OLMC) for assistance in management was included in 70% of protocols, although only 3% mentioned advanced age as an escalation criterion.

Conclusion: The vast majority of state EMS protocols provide guidance on management of agitated patients, including use of physical and chemical restraint, yet modifications or specific guidance for older adults are uncommon. This represents a missed opportunity and suggests that many agitated older adults are not currently receiving optimal prehospital care to minimize potential harm. Further research is needed to understand actual EMS provider management of agitation in older adults in the field as well as ways to improve and standardize this care.

No, authors do not have interests to disclose

50 Time to Provider for Patients With Non-English Language Preferences in the Emergency Department

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Study Objectives: Between 2010 and 2019, the percent of the United States population who prefer to speak a language other than English rose from 9% to 22%, according to the United States Census Bureau. Despite this rise, few studies examine the experiences of patients with non-English Language preferences (NELP) in the emergency department (ED). We assessed the time to provider (TTP) from rooming for NELP patients compared to patients with an English language preference (ELP) in the ED. We hypothesize that TTP is longer for NELP patients compared to ELP patients, and that TTP is longer for NELP patients when a non-English language preference is indicated in a patient's triage note. We additionally hypothesize that TTP is longer for NELP patients compared to ELP patients during times of ED crowding and decreased provider availability.

Methods: We completed a retrospective study of patients over 21 years of age presenting to the ED between July 1, 2019 to June 30, 2023 at an urban academic medical center. Data were collected from the electronic health record. A two-step classification method was used to identify NELP patients. First, patients were classified as NELP based on language preference reported at registration. Second, the triage notes of these patients were reviewed, resulting in further categorization of NELP patients into two categories: patients whose triage notes identify their NELP status (visibly NELP patients) and patients whose triage notes do not identify their NELP status (NELP patients). Median TTP was estimated using the Kaplan Meier method and a multivariable accelerated failure time model was used to estimate the association between NELP status and TTP. Model coefficients were exponentially transformed and reported as time ratio (TR). A subgroup analysis was completed to assess the impact of ED crowding (defined as more than 30 patients in the waiting room) and provider availability (measured by arrival window) on TTP.

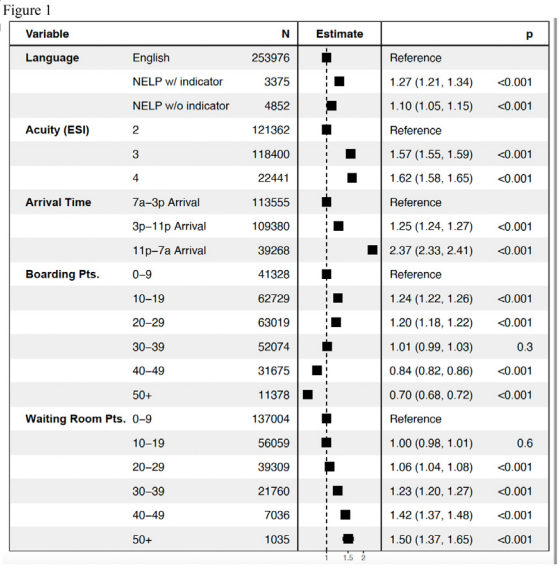
Results: A total of 262,203 visits were included. 4,852 (1.9%) were visits with NELP patients and 3,375 (1.3%) were visits with visibly NELP patients. The median TTP was 11 minutes for ELP patients (95% CI [11-11]), 15 minutes for visibly NELP patients (95% CI [14-16]), and 13 minutes for NELP patients (95% CI [12-14]). During times of ED crowding, ELP patients had a median TTP of 12 minutes (95% CI [12-12]) compared to 21 minutes for visibly NELP patients (95% CI [17-27]) and 17 minutes for NELP patients (95% CI [14-20]). In the subgroup of patients who presented between 7PM and 7AM, the median TTP was 19 minutes for ELP patients (95% CI [19-19]) compared to 28 minutes for visibly NELP patients (95% CI [25-32]) and 25 for NELP patients (95% CI [22-28]). After adjusting for the effects of acuity, arrival time, boarding and waiting room patients at arrival, NELP with a triage note indicating their status was associated 27% delay in TTP (TR 1.27 [95% CI 1.21 - 1.34]) and NELP without a triage note indicator was associated with a 10% delay in TTP (TR 1.10 [95% CI 1.05 - 1.15]).

Conclusion: TTP is longer for NELP patients compared to ELP patients. TTP increases even more for visibly NELP and NELP patients as ED crowding increases and provider availability decreases. Patients identified as NELP in their triage notes were associated with increased TTP, which raises questions regarding potential bias in triage notes as well as the best practices within the ED for managing NELP patients. As ED crowding increases, replication of this study in centers with significant NELP patient populations is important to ensure equitable care.

Time to Provider for Patients with Non-English Language Preferences in the Emergency Department

Asmaa Rimawi MD, Anne Sung MD, Erica Lin MD, Morgan Pike MD, David Haidar MD, Chiu-Mei Chen MS, Richard Medlin MD, Marcia Perry MD, Christopher Fung MD

Figure 1



Variable		N	Estimate	p
Language	English	253976	Reference	
	NELP w/ indicator	3375	1.27 (1.21, 1.34)	<0.001
	NELP w/o indicator	4852	1.10 (1.05, 1.15)	<0.001
Acuity (ESI)	2	121362	Reference	
	3	118400	1.57 (1.55, 1.59)	<0.001
	4	22441	1.62 (1.58, 1.65)	<0.001
Arrival Time	7a–3p Arrival	113555	Reference	
	3p–11p Arrival	109380	1.25 (1.24, 1.27)	<0.001
	11p–7a Arrival	39268	2.37 (2.33, 2.41)	<0.001
Boarding Pts.	0–9	41328	Reference	
	10–19	62729	1.24 (1.22, 1.26)	<0.001
	20–29	63019	1.20 (1.18, 1.22)	<0.001
	30–39	52074	1.01 (0.99, 1.03)	0.3
	40–49	31675	0.84 (0.82, 0.86)	<0.001
	50+	11378	0.70 (0.68, 0.72)	<0.001
Waiting Room Pts.	0–9	137004	Reference	
	10–19	56059	1.00 (0.98, 1.01)	0.6
	20–29	39309	1.06 (1.04, 1.08)	<0.001
	30–39	21760	1.23 (1.20, 1.27)	<0.001
	40–49	7036	1.42 (1.37, 1.48)	<0.001
	50+	1035	1.50 (1.37, 1.65)	<0.001

Figure Legend: Forest plot for a log-normal accelerated failure time model used to estimate the association between non-English language preference (NELP) status and the presence of indicators for NELP in triage notes with time to provider from rooming (TTP). Other covariates in this model were prespecified based on their influence on TTP at the institution from which data were collected. "Boarding Pts" and "Waiting Room Pts" refer to the number of patients in each category at the time of arrival to the ED. Triage notes and acuity level are documented by emergency department nurses who have received training in triage. Estimate and 95% confidence intervals reported are expressed in time ratios (TR, exponentiated model coefficients).

No, authors do not have interests to disclose

51 Improving Resident Racial and Ethnic Diversity

Wahba J, Hernandez N, Hovhannisyan L/Harbor-UCLA Medical Center, Redondo Beach, California, US

Background: Racial and ethnic minorities face significant health inequities. Studies have demonstrated higher patient satisfaction in racial/ethnically congruent clinical encounters. Other studies show that minority physicians are more likely to work in underserved communities. Despite this evidence, Hispanic/Latinx and Black/African American representation in medicine declines through medical school, emergency medicine residency, and academic emergency medicine. The Council of Residency Directors in Emergency Medicine (CORD) and residency programs have published successes and strategies in improving program diversity, equity, and inclusion.

Study Objective: The Harbor Emergency Medicine DEI Committee aimed to increase racial and ethnic diversity of the EM residency program to better reflect the community Harbor-UCLA serves.

Methods: The multimodal approach to improving resident diversity began with growing a robust Harbor EM DEI Committee, led by residents with support from faculty allies. We created subcommittees focused on education, patient experience and community outreach, and recruitment and retention. We also advocated for a new DEI chief position to promote sustainable program leadership. Recruitment initiatives in Spring of 2023 aimed to attract diverse fourth-year medical student rotators, including offering scholarships to visiting underrepresented in medicine (URM) students and creating a bimonthly webinar series. The clerkship also included a social EM curriculum and a mentorship program that paired students with mentors with similar backgrounds/and or interests. Local medical students were also invited to participate in the Interspecialty Women of Color in Medicine Group. During the residency application season, the DEI committee worked closely with program leadership to enhance a holistic scoring system to emphasize diverse backgrounds, languages spoken, challenges, and leadership in service-related activities. Students who identified as racial-ethnic minorities, LGBTQ+ and first generation to college were considered URM. Additionally, DEI resident leadership presented the program's commitment to DEI and social EM initiatives during every interview and hosted a virtual social for applicants dedicated to learning more about departmental DEI initiatives and areas of growth. In close collaboration with program leadership, the DEI committee actively participated in advocating for URM applicants during interview selection and rank list meeting.

Results: The Harbor-UCLA EM Program successfully recruited the most diverse incoming residency class to date, comprising 25% Latinx physicians (4 of 16) and 18.75% Black/African American physicians (3 of 16). All four Latinx interns and one of the Black/African American interns participated in the Interspecialty Women of Color in Medicine Group, further emphasizing the importance of affinity groups in recruitment and retention.

Conclusions: The multifaceted approach in enhancing mentorship, holistic applicant review and interviews, and collaboration with program leadership contributed to successful recruitment of URM residents. As previous studies suggest, this may also contribute to advancing health equity. Future initiatives include retention of diverse residents and faculty as well as enhancing a shared culture of equity and inclusion.

No, authors do not have interests to disclose

52 The Demographics of Duplicate Charts: Increased Prevalence in Spanish-Speaking, Hispanic, and Latino Patients

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Study Objectives: Duplicate charts occur when one patient is assigned multiple charts within a single electronic health record. These charts create opportunity for excess medical cost, redundant work, and patient safety concerns, among other issues. Limited data exists characterizing the patient population with duplicate charts despite potential value in guiding improvement efforts. We evaluated age, sex, race, ethnicity, and primary language in patients with duplicate charts created erroneously during emergency department (ED) encounters, compared to the general ED patient population.

Methods: ED patients with duplicate charts were identified using the EHR's native analytics tool. Patients with duplicate charts created due to unidentifiable status, or to expedite critical care, were excluded. Data analysis was performed using SAS Enterprise Guide 8.3 (SAS Institute, Inc., Cary, NC). Chi-square tests were performed to test statistical associations for patients with in-error duplicate charts compared to all ED patients by categorical patient demographics. A Student's t-test was used to compare mean age of patients for those with duplicate charts to all ED patients.

Results: Between July 2022 and June 2023, 468 ED patients had duplicate charts created erroneously compared to 121,111 general ED patients. Results are summarized in Table 1. There were significant differences in age (P=0.04), sex (P<0.0001), and race (P<0.0001) with 31% (N=146) identifying as "other" in the duplicate chart group compared to 24% (N=28, 996) in the general ED group. Ethnicity was also significantly different between the two groups (P = 0.001), with 34% identifying as Hispanic or Latino (N=158) in the duplicate chart group versus 29% (N=35,393) in all other ED patients. There was a significant difference in patient language with 19% (N=90) reporting Spanish and 76% (N=356) reporting English as their primary language in the duplicate chart group versus 10% (N= 12,687) Spanish and 76% (N=101,729) English in the general ED group (P<0.0001).

Conclusion: Our study found statistically significant differences in all demographic categories evaluated, including age, sex, race, ethnicity, and primary language. Interestingly, there was a greater portion of patients identifying as Hispanic or Latino in the duplicate chart group, as well as a greater portion of Spanish-speaking patients, compared to the general ED population. These findings highlight a population that may be more susceptible to potential adverse effects as a result of duplicate charts. We hypothesize this is related to cultural variations in naming structures and/or barriers to obtaining identification that may create challenges during the registration process. Additional studies are required to further characterize these findings and identify potential etiologies in order to guide improvement efforts.

Table 1: Demographic Data

	ED patients with duplicate charts due to error (N = 468)	All ED patients (N = 121,111)	P-Value
Age (Mean ± SD)	46 ± 21	45 ± 19	**0.0421**
Patient Sex			**<.0001**
Female	236 (50)	64,191(53)	
Male	231 (50)	56,912 (47)	
Unknown or Declined to Answer	1 (0.2)	8 (0.01)	
Patient Race			**<.0001**
American Indian or Alaskan Native	6 (1)	1,423 (1)	
Asian	1 (0.2)	4,084 (3)	
Black or African American	104 (22)	29,306 (24)	
Native Hawaiian or Other Pacific Islander	0 (0)	831 (0.7)	
White	197 (42)	54,625 (45)	
Other	146 (31)	28,996 (24)	
Unknown or Declined to Answer	14 (3)	1,846 (2)	
Patient Ethnicity			**0.0011**
Hispanic or Latino	158 (34)	35,393 (29)	
Not Hispanic or Latino	295 (63)	83,801 (69)	
Unknown or Declined to Answer	15 (3)	1,917 (2)	
Patient Language			**<.0001**
English	356 (76)	101,729 (84)	
Spanish	90 (19)	12,687 (10)	
Other language	22 (5)	5,735 (5)	
Unknown or Declined to Answer	0 (0)	960 (1)	

No, authors do not have interests to disclose

53 How Well Do Emergency Department Patients Recognize Their Providers?

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Study Objectives: Over the past several decades, emergency departments (EDs) have experienced a diversification of provider roles and titles which could limit patients' ability to accurately identify their providers. The recent COVID-19 pandemic may have introduced an additional barrier to provider recognition through the common use of surgical masks. We aimed to evaluate how well patients are able to identify their providers in this complex environment and to describe how demographic factors affect this recognition. Additionally, we aimed to assess how mask use affects patients' recognition of their providers.

Methods: We conducted a prospective randomized controlled trial at a single large academic hospital from August 2022 to November 2023. Participants were English-speaking patients aged 18 years or older presenting to the ED with at least 2 hours of

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exposure to specific ED providers. Exclusion criteria included hemodynamic instability, altered mental status, head or multiple traumas, or a history of mental health concerns, dementia, or seizures. We showed the participants a picture of one of their ED providers after 2 hours of care in the ED, and asked them to complete a survey to identify the provider's role. Provider demographic data collected included provider type (Advanced Practice Provider [APP], Attending Physician, Resident Physician), age (≥40, <40), gender (male, female), race (Black, White, Other), and whether they wore a mask during patient encounters (yes, no). Chi-square and Kruskal-Wallis tests were used to analyze categorical and continuous variables, respectively.

Results: We collected survey results from 117 patients, with an average age of 56, and females comprising 55.6% of the sample. The racial distribution among surveyed patients was 58.1% white, 38% black, and 6.9% other ethnicities. Of the ED providers presented in the surveys, 54.7% were younger than 40 and 55.6% were female. Provider roles consisted of 47% attending physicians, 26.5% resident physicians, and 26.5% APPs. Regarding provider race, 79.5% were white, 1.7% were black, and 18.8% were from other ethnicities. Our results show that male providers were more often accurately identified compared to female providers (60.0% vs 38.5%, p=0.021). However, identification accuracy was not significantly influenced by provider role (p=0.065), age (p=0.11), race (p=0.53), or mask wearing (p=0.95). Furthermore, no significant differences in identification accuracy were found among patients of different genders (p=0.408), age groups (p=0.509), education statuses (p=0.107), or racial backgrounds (p=0.357).

Conclusion: ED patients exhibit differing degrees of medical provider recognition, with provider demographics of male gender showing the highest rates of identification accuracy. Surprisingly, mask wearing did not show a significant decrease in provider identification accuracy. Further research is warranted to explore the underlying factors contributing to these identification patterns and their potential implications for patient-provider interactions and healthcare outcomes.

Table 1. Provider Identification Results According to Patient and Provider Demographics

	Correct Provider Identification (N=58)	Incorrect Provider Identification (N=59)	Total Responses (N-117)	p-value
Patient Gender				0.408
Male	28 (53.8%)	24 (46.2%)	52	
Female	30 (46.2%)	35 (53.8%)	65	
Patient Race				0.357
White	31 (45.6%)	37 (54.4%)	68	
Black	24 (58.5%)	17 (41.5%)	41	
Other	3 (37.5%)	5 (62.5%)	8	
Provider Gender				0.021
Male	26 (40%)	39 (60%)	65	
Female	32 (61.5%)	20 (38.5%)	52	
Provider Age				0.112
Less than 40	36 (56.3%)	28 (43.7%)	64	
Greater than or equal to 40	22 (41.5%)	31 (58.5%)	53	
Provider Race				0.534
White	43 (46.2%)	50 (53.8%)	93	
Black	1 (50%)	1 (50%)	2	
Other	14 (63.6%)	8 (36.4%)	22	
Provider Type				0.065
Attending	21 (38.2%)	34 (61.8%)	55	
Resident	18 (58.1%)	13 (41.9%)	31	
Advanced Practice Provider	19 (61.3%)	12 (38.7%)	31	
Provider Mask Use				0.949
Yes	38 (49.4%)	39 (50.6%)	77	
No	19 (48.7%)	20 (51.3%)	39	
Not documented	1 (100%)	0 (0%)	1	

No, authors do not have interests to disclose

54 Effect of Patient Gender on Setting Ceilings of Care: A Survey of Clinical Decisions in European Emergency Physicians

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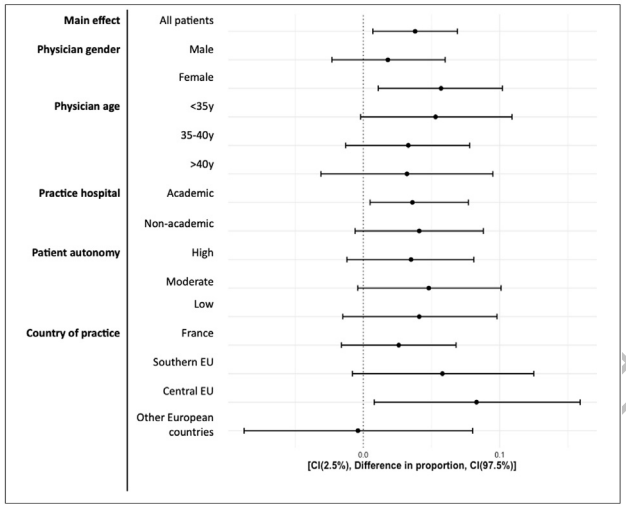
Study Objective: Ceiling of treatment refers to the highest level of predetermined care considered appropriate by the health care team and in alignment with the patient's and their family's belief systems. Determining ceiling of treatment and limitations of care present complex challenges for physicians. Emergency physicians consider many factors when deciding treatment and airway support measures (such as intubation) for patients in acute respiratory distress. These may include the patient's wishes, comorbidity and autonomy. Previous studies have reported that emergency physicians may treat male and female patients differently. Although bias has been identified in various aspects of healthcare, it remains unclear whether a patient's sex influences decisions on limitations of care. The objective of this study was to assess the effect of patient's sex on the recommended ceiling of treatment.

Methods: This was a European survey study using a standardized case scenario, initiated by a French research network, which was conducted over a 2-week period in April 2024. In France and Spain, physicians were invited by email through their national Society of Emergency Medicine. Other European countries were contacted by the primary investigators of France and Spain, who asked them to share the questionnaire with their colleagues. Internal validity of the survey was assessed using the test-retest method with 50 emergency physicians. The survey consisted of a single clinical case: a 75-year-old patient with no cognitive impairment presents to the emergency department in acute respiratory distress. The patient's condition deteriorates while being treated with maximum supplemental oxygen via non-rebreather mask. The survey respondent was asked to set the ceiling of care for the clinical case, and specifically asked to decide whether or not they would recommend intubation and mechanical ventilation, or set the ceiling at ward based care (non-invasive ventilation or face mask oxygen), for acute respiratory distress in this case. Each responding physician was randomly assigned one of six vignettes. These vignettes only varied by sex (woman/man) and three levels of autonomy related to a specific daily activity. The levels of autonomy described were: 1) the patient can do grocery shopping alone, 2) the patient cannot do grocery shopping alone but can bathe alone, 3) the patient cannot do either grocery shopping or bathe alone. The primary objective of this study was to compare the ceiling of care between male and female patients. The primary endpoint was the recommendation of intubation and mechanical ventilation, as opposed to a ceiling of treatment of non-invasive ventilation. The secondary objective was to compare the ceiling of treatment according to autonomy defined by daily activity. The responding physicians were blinded to the objectives of the study and to the content of other 5 vignettes outside of the one that was randomly assigned to them.

Results: 3,423 physicians responded (mean age 40 years, 46% women, 92% emergency physicians), comprising 1532 (45%) from France, 494 (14%) from Spain, 247 (7%) from Italy, and 245 (7%) from United Kingdom. The internal validity of the survey was confirmed, with 50 participating emergency physicians provided identical responses in both sessions. For the three different levels of autonomy, sedation and intubation was recommended in 80%, 72% and 57% of cases respectively. Female patients were less likely to be intubated than males (67.9% vs. 71.7%, difference in percentage 3.8% [95% CI: 0.7% – 7%]). Multivariable logistic regression reported that a patient's female sex, lower autonomy, and a physician's female gender were associated with a decreased likelihood of intubation. Subgroup analyses showed consistent homogeneous results (Figure).

Conclusion: This survey study reports a gender-based disparity in the decision process of limitation of care, with lower proportion of intubation recommendation for patients of female gender.

Figure
Subgroup analysis: ceiling of care according to patient gender in different subgroups; in all patients (main effect) and in different subgroups (subgroup analysis)



No, authors do not have interests to disclose

55 The Effect of Federal Policy Changes on Buprenorphine Prescribing in Massachusetts

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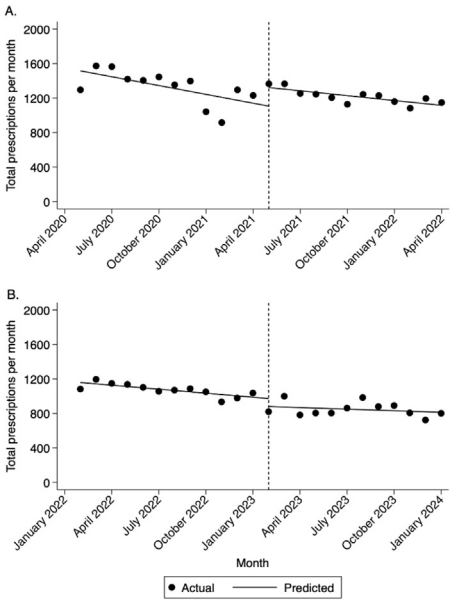
Study Objective: Despite evidence supporting the effectiveness of buprenorphine, most individuals with opioid use disorder (OUD) in the US do not receive treatment. Historically, prescribers were required to obtain an X-waiver to prescribe buprenorphine, which may have been a barrier to its wider use. Two federal policy changes were recently implemented to expand access. First, in April 2021, the US Department of Health and Human Services (HHS) released a practice guideline that allowed providers to prescribe buprenorphine to a maximum of 30 patients simultaneously, without needing additional training. Second, in January 2023, the X-waiver federal requirement was removed, and licensed prescribers are now allowed to prescribe buprenorphine without a patient cap. The objective of this study was to determine if these policy changes were associated with a change in the trend of the amount of buprenorphine prescriptions written by emergency physicians in the state of Massachusetts.

Methods: This was a retrospective analysis of monthly buprenorphine prescriptions written by emergency physicians in Massachusetts between May 1, 2020 and January 31, 2024. Deidentified data were extracted from the Massachusetts Prescription Drug Monitoring Program including name and National Drug Code (NDC) of prescribed drug, month and year of prescription, and prescribers' license and specialty categories. NDCs were used to identify prescriptions of buprenorphine formulations typically used for OUD treatment, as opposed to pain management. Monthly statewide total buprenorphine prescriptions were measured during 12-month pre- and post-time periods for the two policies studied in this investigation. An interrupted time series analysis was used to compare the number of buprenorphine prescriptions per month (bppm) from May 2020 to April 2021 (pre-practice guideline) versus May 2021 to April 2022 (post-practice guideline) and also to compare bppm from February 2022 to January 2023 (pre-no-X-waiver) versus February 2023 to January 2024 (post-no-X-waiver).

Results: There were 15,932 and 14,617 buprenorphine prescriptions written by emergency physicians in the pre- and post-practice guideline periods, respectively. There was a decreasing trend of 34.1 (95% CI -64.7 to -3.44) fewer bppm in the pre-practice guideline period (Figure 1). The immediate change in the month following implementation of the HSS guideline was an increase of 215.0 (95% CI -28.2 to 458.2) prescriptions. In the post-practice guideline period, a decreasing, but of lessened magnitude, trend continued (-18.7 bppm; 95% CI -27.9 to -9.5). There were 12,875 and 10,154 buprenorphine prescriptions written by emergency physicians in the pre- and post-no-X-waiver periods, respectively. There was a statistically significant decreasing trend of 15.5 (95% CI -25.8 to -5.2) fewer bppm in the pre-no-X-waiver guideline period. The immediate change in the month following elimination of the X waiver was a non-significant decrease of 92.8 (95% CI -217.7 to 32.3) prescriptions. In the post-no-X-waiver period, the decreasing trend persisted but was no longer statistically significant (-6.1 bppm; 95% CI -20.1 to 7.9).

Conclusion: During the study period, there has been a decrease over time in buprenorphine prescriptions written by emergency physicians in Massachusetts. The analysis suggests that the two federal policy changes studied in this investigation were not associated with a significant change in the trend of buprenorphine prescriptions written by these physicians. The magnitude of decline in bppm may have been tempered by these policies but the policies did not overcome the previous trend of decreasing bppm.

Figure 1. Trends in buprenorphine prescriptions in the 12-month periods before and after A) the HSS practice guideline implemented in April 2021, and B) the X-waiver requirement removed in January 2023.



No, authors do not have interests to disclose

56 Impact of 2023 Centers for Medicare and Medicaid Services Guidelines on Point-of-Care Emergency Ultrasound Billing

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Background: The new 2023 Centers for Medicare and Medicaid Services (CMS) billing guidelines have changed Emergency Medicine (EM) billing and reimbursement. There has been a refocus on the medical decision making (MDM), the risk of morbidity, and the overall medical complexity. While it is clear that overall EM billing has been impacted, it is uncertain how point-of-care ultrasound (POCUS) billing has been affected. Emergency Physicians (EPs) have historically struggled to receive fair compensation for POCUS services (< 10% of studies performed). Elucidation of how 2023 CMS changes to POCUS billing can allow us to further advocate for appropriate compensation.

Study Objectives: To characterize how POCUS billing has been affected by the 2023 CMS billing changes.

Methods: This was a retrospective cohort study performed at a large urban quaternary care center. Descriptive statistics was used to compare baseline characteristics of patients in 2022 and 2023. We compared overall volume of documented POCUS by month as well by Current Procedural Terminology (CPT) codes of 2022 to 2023 via an unpaired t-test. We further evaluated the proportion that used POCUS to elevate the overall level of billing in 2 months in 2023. We describe reimbursement rates overall and by payer mix by descriptive statistics.

Results: In total, there were 2,900 and 2,778 patient encounters with at least one POCUS documentation in 2022 and 2023 respectively. The mean ages of the patient population were 37.4 + 23.8 and 35.7 + 24.0 in 2022 and 2023 respectively. 56.3% and 54.6% of patients identified as female in 2022 and 2023 respectively. There was no statistical difference between the volumes of billed POCUS by month nor in the types of ultrasounds performed by CPT code in 2022 and 2023 ($p = 0.47$ and 0.90 respectively). In the months of April and October of 2023, 4.5% of encounters used POCUS documentation for elevation of complexity. The overall reimbursement rate of separately billed POCUS were 65.4% and 64.4% in 2022 and 2023 respectively. The reimbursement rate of Medicaid was 66.8% and 63.3%, Medicare was 74.4% and 70.4%, private insurance was 64.7% and 70.8% in 2022 and 2023 respectively.

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

Conclusions: There was no statistical difference between the volume or type of POCUS documented between 2022 and 2023. Reimbursement rates for separately billed POCUS procedures also remained largely unchanged with an exception to those with private insurance where there was a slight trend for increased reimbursement. There was a small proportion of patients where POCUS were able to elevate the overall level of billing, but not enough to influence overall reimbursement. The 2023 CMS changes to billing have not significantly changed billing practices or reimbursement rates for POCUS.

No, authors do not have interests to disclose

57 Risk Adjustment and the Emergency Department: Who Are Our Frequent Utilizers?

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Background: Emergency department (ED) utilization and associated healthcare spending in the United States are rising rapidly, with substantial implications for inpatient facilities and downstream outpatient providers. Per national trends toward preventative medicine and value-based care, the Centers for Medicare & Medicaid Services (CMS) created the Hierarchical Condition Categories (HCC) model to assist healthcare organizations with risk anticipation. Conditions as denoted by International Classification of Diseases (ICD-10) coding are assigned CMS-HCC relative risk weights (ie, risk coefficients) based on expected healthcare spend, with only severe and/or chronic conditions receiving HCC codings. This study aims to characterize and evaluate frequent ED utilization relative to CMS-HCC diagnoses.

Methods: This is a 3-year multi-facility retrospective cohort study that considers frequent ED utilizers (3-20 ED presentations in the last twelve months). Comparisons of demographic and medical variables, including most common ICD-10 categories and diagnoses, are made between CMS-HCC and non-CMS-HCC cohorts using Pearson's chi-squared test and unpaired t-test. Finally, multivariate regression is used to evaluate CMS-HCC status and HCC risk coefficients, respectively, as predictors of hospitalization disposition after ED presentation and hospital length of stay. The following control variables were included in the regression models: insurance status, socioeconomic resource availability, ED location, total ED presentation in past 12 months, and duration of primary care relationship.

Results: 76,903 total ED presentations (11,089 CMS-HCC) were included in the final analysis. The CMS-HCC cohort was associated with greater visit volume in the last 12 months (5.97 vs. 5.36 visits; $p<0.001$), higher rates of post-ED hospitalization (59.75% vs. 38.59%; $p<0.001$), and longer hospital length of stay (7.93 vs. 6.53 days; $p<0.001$). CMS-HCC diagnosis significantly predicted post-ED hospitalization (OR=2.39, $p<0.001$) and HCC risk coefficient magnitude significantly predicted hospital length of stay ($\beta=2.26$, $p<0.001$).

Conclusions: CMS-HCC and non-CMS-HCC patient visits had widely discrepant underlying demographic and medical characteristics, with CMS-HCC ED visits associated with significantly greater downstream hospital care needs. CMS-HCC diagnosis and HCC risk coefficient magnitude were quantified as predictors of post-ED hospital care needs. While the CMS-HCC model was developed as a predictor of healthcare costs for capitation payment purposes, this study demonstrates its utility as a predictor of ED and inpatient hospital course.

Figure 1. Overview of CMS-HCC model and risk adjustment process

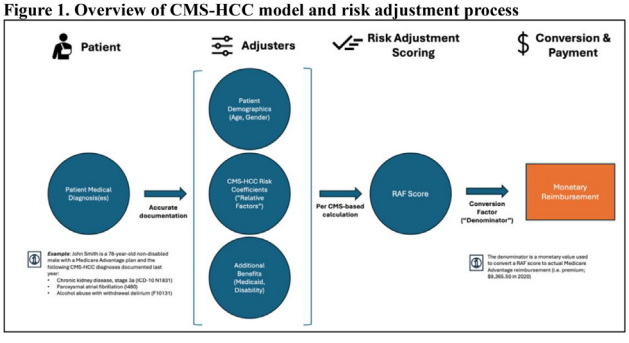
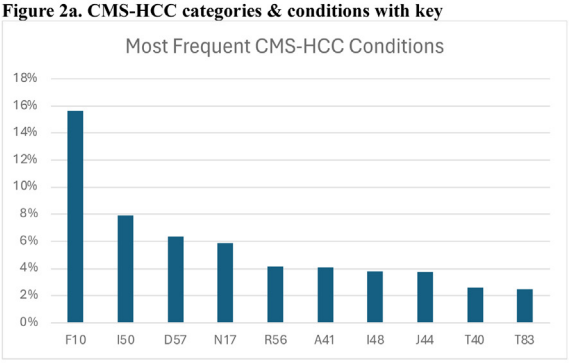
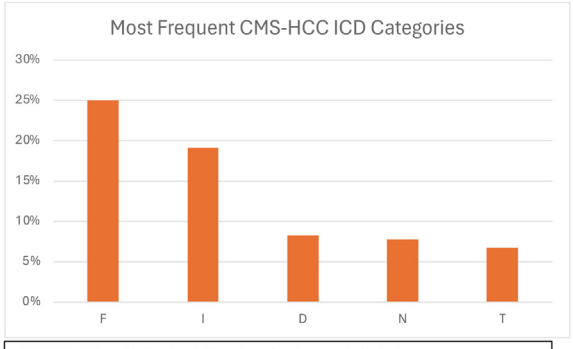


Figure 2. Most frequent diagnosis categories & conditions by cohort

- **Figure 2a. CMS-HCC categories & conditions with key**

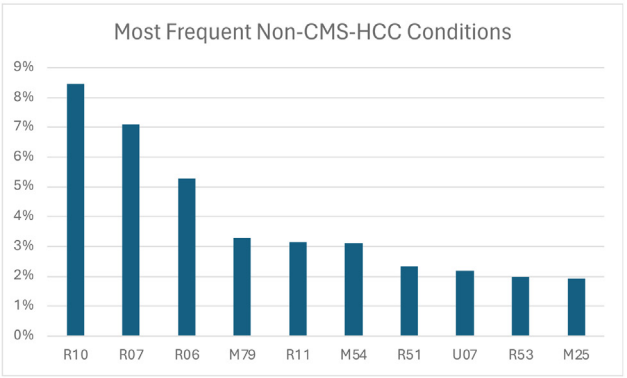


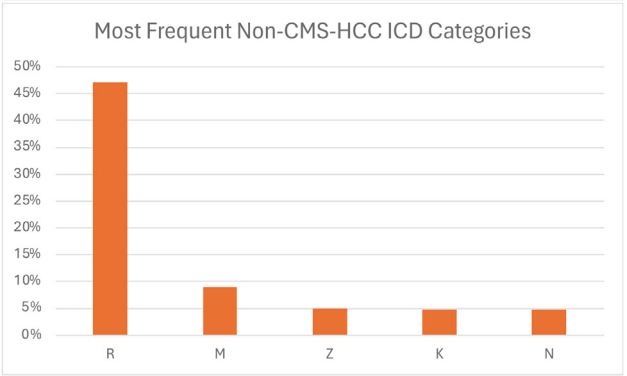


F10: Mental and behavioral disorders due to use of alcohol
I50: Heart failure
D57: Sickle-cell anemia
N17: Acute kidney failure
R56: Convulsions
A41: Sepsis
I48: Atrial fibrillation and flutter
J44: Chronic obstructive pulmonary disease
T40: Poisoning by narcotics and psychodysleptics
T83: Complications of genitourinary prosthetic devices, implants, and grafts

F: Mental and behavioral disorders
I: Diseases of the circulatory system
D: Endocrine, nutritional, and metabolic disorders
N: Diseases of genitourinary system
T: Injury, poisoning, certain other consequences of external causes

- **Figure 2b. Non-CMS-HCC categories & conditions with key**





R10: Abdominal and pelvic pain
R07: Pain in throat and chest
R06: Abnormalities of breathing
M79: Unspecified soft tissue disorders
R11: Nausea and vomiting
M54: Low back pain
R51: Headache
U07: COVID-19
R53: Malaise and fatigue
M25: Joint disorders

R: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
M: Diseases of the musculoskeletal system and connective tissue
Z: Factors influencing health status and contact with health services
K: Diseases of the digestive system
N: Diseases of genitourinary system

No, authors do not have interests to disclose

58 Variation in the Rate of EMTALA Investigations and Resulting Citations

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Study Objectives: The Emergency Medical Treatment and Labor Act (EMTALA) requires that all emergency department (ED) patients receive a medical screening examination (MSE), stabilization of identified emergency conditions, as well as transfer if specialized services are required for stabilization, regardless of ability to pay. Enforcement is delegated primarily to the regional offices of the Centers for Medicare & Medicaid Services (CMS) which authorizes investigations and issues citations to hospitals with substantiated EMTALA violations. Between 2005 and 2014, 44% of EMTALA investigations resulted in one or more substantiated violations, with an average of three deficiencies per citation. This study explores variation in conversion from investigation to citation for EMTALA violations at the temporal, regional, and deficiency-type levels.

Methods: Information about all EMTALA investigations from 2004 to July 2021 was obtained from CMS via Freedom of Information Act (FOIA). Data provided included unique event-level investigation identifiers, hospital location, date of allegation intake, specific EMTALA deficiencies evaluated, and allegation finding (substantiated EMTALA violation vs unsubstantiated). Because a single EMTALA investigation can involve allegations of multiple violations (there are 12 types of EMTALA deficiencies including administrative deficiencies such as sign posting and clinical deficiencies such as failure to MSE), findings are analyzed at the level of an EMTALA investigation event. Variation in the share of investigations with *any* substantiated allegation resulting in a citation for EMTALA violation is described by year, state, CMS region (the level of EMTALA enforcement), and specific allegation.

Results: From 2004 through 2021, there were 8,495 distinct EMTALA investigations, of which 3,886 (45.7%) resulted in a citation for one or more substantiated allegation of violation. Over time, the rate of investigations with substantiated allegations increased until 2015, when 56.7% of investigations were substantiated. Since 2015, that rate flattened and then decreased starting in 2019 to 30.4% in 2021. There was notable geographic variation in rates of investigations with substantiated allegations. The CMS region with the highest rate of substantiated investigations (R9: 66.7%) is 28 percentage points higher than the CMS region with the lowest (R6: 38.5.6%). At the state level, the variation in rates of substantiation is even higher. In New Jersey, 93% of investigations were substantiated compared with 26% in Arkansas. Investigations with substantiated violations are more common when the specific allegations are related to transfers; 62.5% for failure to report an inappropriate incoming transfer, 56.7% for failure to send appropriate records with transfer, and 53.1% for failure to accept an appropriate incoming transfer.

Conclusions: There is notable temporal, geographic, and deficiency-level variation in the rates of EMTALA investigations resulting in citation for one or more substantiated allegations of violations. Some portion of temporal and geographic variation may stem from differential exposure to EMTALA associated with the number of ED visits in a given year, state, or region. Whether residual geographic variation is related to differential reporting at the state level or enforcement at the regional level remains to be determined. The notable conversion rate related to transfer acceptance, transfer records, and reporting of inappropriate transfers indicates that to ensure compliance, providers may need additional education about these transfer-specific EMTALA requirements.

No, authors do not have interests to disclose

59 Comparative Analysis of Emergency Department Utilization Patterns During the COVID-19 International Pandemic: Frequent Users vs General Population

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Study Objectives: Frequent emergency department (ED) users present specific challenges in that they often have a medical complaint whether acute or chronic that warrants investigation in addition to complex psychosocial factors. Our hospital has identified frequent users in a program previously described, Community Resources for Emergency Department Overuse (CREDO), who may have complex medical and social needs. The COVID-19 pandemic caused increased stressors on the medical system, decreasing efficiency and access along with diminished social support. This study aimed to evaluate the impact of the effects of a global pandemic on frequent users, specifically the CREDO population with respect to ED utilization.

Methods: This was a retrospective observational analysis of patients aged 18 years or older, from a single center tertiary care inner city hospital, who presented to the ED during two periods: July 2018-July 2019 (pre-COVID) and July 2022-July 2023 (post-COVID). CREDO patients were a subset of frequent users with 10 or more ED visits within the last year, identified through a banner in the electronic health record with a care plan of individualized treatment recommendations. Outcomes included ED length of stay (LOS) and rates of leaving without completing services (LWCS), which included against medical advice (AMA) and left before being seen (LWBS) dispositions. A banner notified providers of recommendations to expedite care in patients. The analysis includes descriptive and univariate statistical comparisons, reporting standard deviation [SD] and 95% confidence intervals (CI) where appropriate.

Results: Analysis included 89,768 general adult and 3,690 CREDO patient encounters pre-COVID and 73,994 general adult and 3,740 CREDO patient encounters post-COVID. [SD1] CREDO patients pre- and post-COVID were mostly Black (86% and 79%, respectively), male (72% and 78%), with an average age of 52 and 49 years. LOS were compared during both timeframes. Pre-COVID, CREDO patients had a mean LOS of 431 [332] versus 420 [357] minutes in the general population (difference 11, 95% CI 1 to -22 minutes, p=0.056). Post-COVID, CREDO patients had a mean LOS of 528 [496] versus 674 [697] minutes for general

patients (difference -147, 95% CI -130 to -163 minutes, p<0.001). The pre-COVID rate of LWCS in the CREDO group was 11.8% versus 35.1% post-COVID (p<0.001), whereas the LWCS rate for the general population was 6.7% pre-COVID and 14.8% post-COVID (p<0.001). Post-COVID, CREDO patients had 3.4 times the odds (95% CI 3.1 – 3.6, p<0.001) of leaving LWCS compared to all other patients.

Conclusion: Post-pandemic, the ED faced longer boarding times and nursing shortages, resulting in increased LOS for both groups. Although LOS was generally longer post-COVID, the increase was less pronounced for CREDO patients. Healthcare providers streamlined care for CREDO patients using the banner, mitigating resource pressure. However, the decreased LOS among CREDO patients post-COVID was also influenced by their increased LWCS rate. Although the association between these factors and LOS cannot be definitively determined from the available data, it remains a plausible contributing factor. The use of the CREDO banner is effective in managing patient flow after COVID-19, however, further analysis is needed to fully understand the impact of factors such as LWCS on LOS and patient outcomes among CREDO patients.

No, authors do not have interests to disclose

60 Introduction of Urinalysis With Reflex Culture Orders and Association With Screening, Diagnosis, and Treatment Practices for Urinary Tract Infections in the Emergency Department

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Study Objectives: Urinary tract infections (UTI) and asymptomatic bacteriuria (ASB) are commonly diagnosed in the emergency department (ED) utilizing urinalysis (UA), urine cultures, and physical exam. Distinguishing between UTI and ASB can be challenging, and antibiotics are frequently initiated in asymptomatic patients. Current popular practice includes ordering UA and urine culture simultaneously for UTI evaluation; however, urine culture orders should be replaced by a UA with reflex urine culture per an Infectious Diseases Society of America multidisciplinary expert panel. A UA with reflex culture was introduced throughout the EDs. The primary objective was to compare the proportion of ED patients ordered urine cultures with a negative UA in the pre- and post-implementation cohorts. Secondary objectives included proportion of patients with urine culture orders prior to available UA results, clinical appropriateness of urine cultures, and initiation of empiric antibiotics.

Methods: This was a retrospective, multicenter, cohort study of adult patients discharged from the ED between July 11, 2022 to January 11, 2023 with a completed UA or UA with reflex [AW1] culture order during their visit [CM2]. An abnormal UA was defined as the presence of more than 10 white blood cells per high power field; this is the criterion utilized by health-system laboratories for reflexed urine cultures from UA with reflex orders. [AW3] [AT4] [MC5] A random subset of patients was analyzed from the pre- and post-implementation group to assess the clinical appropriateness of urine cultures [WJ6], defined as abnormal UA with the presence of UTI symptoms, suspected or confirmed catheter-associated UTI, or suspected ASB for pregnant patients or those with an endoscopic urological procedure within 30 days.

Results: Of the 26,685 ED patients with UA orders, 14,859 patients were included in the pre- and 11,826 were included in the post-implementation groups. 2,478 (16.7%) versus 1,841(15.6%) patients in pre- and post-implementation groups had abnormal UAs, and 5,551 versus 2,632 patients were ordered urine cultures in those groups respectively. Urine culture orders despite a negative UA decreased from 30.7% pre-implementation to 9.3% post-implementation (risk ration (RR) 0.3, 95% confidence interval (CI) 0.28-0.32). Empiric outpatient antibiotic also decreased from 15.3% to 8.8% respectively between the cohorts (RR 0.57, 95% CI 0.53-0.61). In patients with urine culture orders, 3,381 (60.9%) in pre-implementation versus 478 (18.2%) urine cultures were ordered before the availability of UA results (RR 0.30, 95% CI 0.27-0.32). In a random subset of patients with UA and urine culture orders, a 14.8% increase in clinically appropriate urine culture was observed in the post-implementation cohort (RR 1.51, 95% CI 1.12-2.03).

Conclusion: Implementation of UA with reflex culture in the ED was associated with decreased urine culture ordering and processing, decreased empiric antibiotic prescribing, and increased clinical appropriateness of urine cultures.

No, authors do not have interests to disclose

61 Paxlovid Efficacy in Unvaccinated COVID-19 Patients: A Comprehensive Review of Outcomes

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Background: Paxlovid is an oral antiviral treatment composed of nirmatrelvir and ritonavir, designed to treat COVID-19 in individuals at risk of severe outcomes. While studies have shown mixed results regarding its efficacy, unvaccinated COVID-19 patients typically face a poorer prognosis. This study aims to evaluate the outcomes of unvaccinated COVID-19 patients who were treated with Paxlovid in the emergency department, compared to those who did not receive the medication.

Methods: This retrospective study was conducted using data from the TriNetX database, which includes records from 64 academic medical centers and healthcare organizations across the United States, covering 112 million patients. The study period spanned from January 2022 to March 2024. The cohort included COVID-19 vaccinated emergency department patients aged 18 years or older who tested positive for COVID-19 via an RNA test and were administered Paxlovid (nirmatrelvir + ritonavir) on the same day of diagnosis. Patients who were admitted for observation or inpatient care on the same day were excluded from the study. Outcomes assessed within 1 to 28 days following the emergency department diagnosis included mortality, ICU admission, inpatient hospitalization, observation status, and hypoxia (O2 saturation ≤90%). Propensity score matching was used to adjust for demographics and 21 pre-existing conditions known to influence mortality and severity of COVID-19.

Results: This analysis identified a total of 198,750 COVID unvaccinated patients prescribed Paxlovid (n=14,799) or not prescribed Paxlovid (n=179,382) before exclusions. After exclusions and propensity matching, there were 14,799 patients in each cohort. Unvaccinated patients treated with Paxlovid were associated with lower mortality (0.1% vs 0.4%, RR 0.28, p<0.001), less ICU admissions (0.2% vs 0.3%, RR 0.53, p=0.01), inpatient visits (0.7% vs 1.8%, RR 0.40, p<0.001) observation status (0.1% vs 0.2%, RR 0.36, p=0.004) and hypoxia (0.3% vs 0.6%, RR 0.49, p<0.001). The results were similar prior to propensity matching.

Conclusions: Unvaccinated adults treated in the emergency department with Paxlovid are associated with lower mortality, ICU admissions, hospitalizations, observation status, and hypoxia. This data supports the use of Paxlovid in unvaccinated patients who acquire COVID-19 infections.

No, authors do not have interests to disclose

62 Single Dose Aminoglycosides for Acute Uncomplicated Cystitis in the Emergency Department Setting

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Background/Study Objectives: Antibiotics are routinely prescribed to treat urinary tract infections in the emergency department. These infections are most commonly treated with beta-lactams which require a completion of a week-long prescription as an outpatient. Alternative agents such as sulfamethoxazole-trimethoprim and fluoroquinolones can also be used, but all of the named options have seen growing rates of antibiotic resistance. While aminoglycosides have been an appropriate choice to treat most UTIs, their use was decreased by 41% between 2002-2009 mainly due to renal toxicity that was associated with multi-day regimes of aminoglycosides as well as the advent of newer, easy to use antibiotic therapies. Data from Goodlet et al.'s systemic review of single dose aminoglycosides to treat urinary tract infections found that patients had a pooled microbiological cure rate of 94.5% +/- 4.3% as a result of the single dose aminoglycoside therapy. This data suggested there is likely beneficial use of single dose gentamicin treatment in the emergency department for uncomplicated cases of cystitis. Our study aimed to expand upon these prior findings with hopes to change practice drastically, both by removing the aspect of patient compliance and simultaneously promoting antibiotic stewardship by eliminating the variability seen in prescribing patterns by providers.

Methods: Randomized enrolled patients had to be at least 18 years of age, woman, premenopausal, and non-pregnant, with clinical signs of UTI and nitrite positive urine in the ED. Patients were contacted by telephone at 7 and 30 days and asked about clinical resolution of their urinary tract infection: pain with urination, frequency, or urgency. Adverse effects, missed doses,or return to a healthcare provider for any reason by day 30 following treatment were also obtained.

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Results: Age and weight of the N=34 patients enrolled in both the single dose aminoglycoside and standard of care groups were similar, 33+10 years and 78+21kg. Drugs utilized in the standard of care group were typically nitrofurantoin or cefdinir. Average dose of aminoglycoside was 331+61 mg. Lost to follow-up were n=7 in the standard of care group and n=4 in the single dose aminoglycoside group. Among those with 7-day telephonic follow-up, self-reported symptom resolution was 83.3% (25/30) among aminoglycoside treated patients and 48.1% (13/27) in the standard of care group (X2 = 7.917, p = 0.005). No return to hospital were noted among the aminoglycoside patients; in the standard of care group, return rate was 17.6% (n=6/34, Fisher's Exact test = 0.025). Eight patients in the standard of care group, 29.6% (n=8/27), missed doses; average number of missed doses was 7+4. A nonsignificant higher rate of adverse events was noted in the aminoglycoside group, attributed largely to IM injection site soreness which resolved.

Discussion/Conclusion: Single dose aminoglycosides for acute uncomplicated cystitis in premenopausal, nitrite positive women is an appropriate UTI treatment and assures 100% compliance when compared to current standard ED outpatient antibiotic treatment. Although transient injection site soreness was reported, symptom resolution, treatment failure and drug compliance all favored aminoglycoside over standard of care.

No, authors do not have interests to disclose

63 Incidence and Mortality of Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis Following Completion of COVID-19 Vaccination: A Retrospective Analysis

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Study Objectives: COVID-19 infection has been shown to increase the incidence of Stevens Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN). Recently, case reports have also begun to document occurrences of SJS/TEN following the administration of COVID-19 vaccines, including both United States and international formulations. However, existing studies in this area have been hindered by small sample sizes. The objective of this study was to determine the 8-week incidence of SJS/TEN following completion of the COVID-19 primary vaccination series. The secondary outcome was to determine the 8-week mortality rate in fully vaccinated patients who developed SJS/TEN.

Methods: We conducted a retrospective analysis of the Cosmos database (Epic Health Systems, Madison, WI) from January 2021 to March 2024. The Cosmos database comprises data submitted by United States organizations using the Epic electronic health record system. Cosmos includes 11.3 billion patient encounters, 245 million patients, and is the largest integrated database of patient profiles in the United States. These factors were taken into account when determining the optimal approach to study the rare pathology of SJS/TEN. Patients were considered fully vaccinated if they had completed either two doses of a two-dose primary series or one dose of a single-dose primary series, and it had been 14 days or more since they received the final dose of their primary series. Patients were assessed for the development of a new diagnosis of SJS/TEN in the following 8 weeks, and the mortality rate was quantified. To establish the incidence of SJS/TEN among individuals who had never received any COVID-19 vaccination, patients were assessed in 8-week intervals from January 2021 to March 2024 to find newly diagnosed cases of SJS/TEN, employing identical time frame criteria. Statistical comparisons were conducted using the chi-square test with a significance level of $p<.05$.

Results: Among all patients in Cosmos, 70,057,850 completed their primary vaccination series between January of 2021 and March of 2024. Of these, 457 received a new diagnosis of SJS/TEN within 8 weeks following vaccination. The mean age of this population was 57 years with 65% classified as female. The majority were White (70%), followed by Black or African American (20%), and Asian (7%). The incidence of SJS/TEN was nearly 7-fold greater in patients who were unvaccinated compared to patients who completed their primary vaccination series (45.3 versus 6.5 cases per 1,000,000 individuals, $p<0.001$). The 8-week mortality rate among SJS/TEN patients who were unvaccinated was significantly higher compared to SJS/TEN patients who completed their primary vaccination series (8.3% vs. 3.2%, $p< 0.001$).

Conclusion: This study found an increased incidence of SJS/TEN in unvaccinated patients as well as worse mortality outcomes compared to those who completed their COVID- 19 primary vaccination series when using an 8-week interval. One explanation for these findings may involve increased COVID-19 infection in unvaccinated individuals, which has been linked to a heightened incidence of SJS/TEN. Likewise, these outcomes may stem from a more severe clinical trajectory following infection, as COVID-19 vaccination mitigates severe illness. Further investigation is warranted to elucidate the relationship between COVID-19 vaccination and SJS/TEN due to the variability in current literature.

No, authors do not have interests to disclose

64 Incidence of Concomitant Bacterial Infection in Hospitalized Patients With a Positive Viral Respiratory Panel

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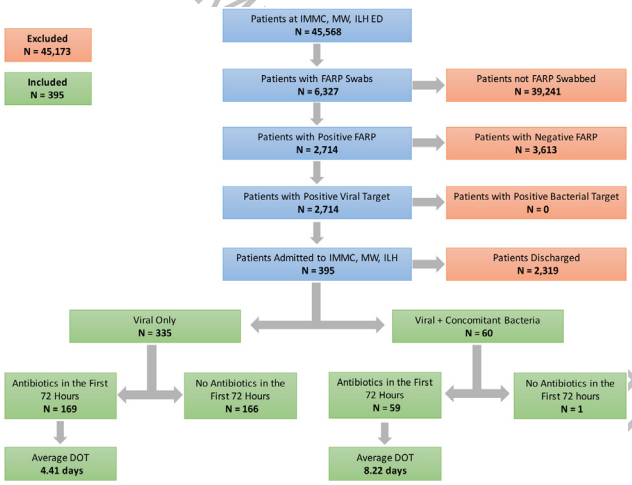
Study Objectives: Patients presenting to US emergency departments (EDs) with concern for respiratory infection often receive multiplex molecular viral testing. The frequency of concomitant bacterial infections in patients with a positive viral target is unknown. This study seeks to determine the frequency of concomitant bacterial infection present on hospital admission in patients with positive viral targets. Secondarily, it examined clinical variables present on admission.

Methods: A retrospective study was conducted of adult patients presenting to any of three Eds in a single Midwestern health system from July-December 2022. Inclusion criteria were all patients hospitalized with a positive viral target on FilmArray Respiratory Panel (FARP) v2.1 (BioFire Diagnostics) $\leq$ 72 hours from admission. A multidisciplinary team performed blinded chart reviews to determine if the available clinical evidence (eg imaging, labs, culture results) supported the diagnosis of concomitant bacterial infection. Patients were categorized as viral only infection (Vi) or viral + concomitant bacterial infection (ViCon). The ViCon group was further classified as bacteremic vs non-bacteremic and respiratory vs non-respiratory. Antibiotic duration of therapy and lab values within 72 hours of admission were also collected.

Results: Study included 395 hospitalized patients admitted through the emergency department with a positive viral target. All hospitalized patients with negative FARP testing and any patient discharged to home were excluded. 335 (85%) were categorized as Vi and 60 (15%) as ViCon. ViCon patients were further categorized as bacteremic (18/60) vs non-bacteremic (42/60). Of the non-bacteremic patients 34 had a bacterial respiratory source and 8 had non-respiratory bacterial source. 50% of bacteremic patients had a respiratory source. Relative to the Vi group, the ViCon group tended to have bandemia >10% (15% vs 1%; Δ95% CI: 5%, 23%), procalcitonin level ≥5 (32% vs 3%; Δ95% CI: 17%, 42%) and greater median antibiotic days of therapy (8 vs. 3; Δ95% CI: 4, 6).

Conclusions: In this study, patients admitted to the hospital with a positive viral target had a 15% chance of concomitant bacterial infection. This preliminary retrospective data suggest bandemia >10% and procalcitonin ≥5 may help distinguish patients who may need antibiotic therapy.



No, authors do not have interests to disclose

65 Pharmacist-Based Treatment of Hepatitis C Virus Infection in the Emergency Department Improves Treatment Uptake Rates and Time to Treatment

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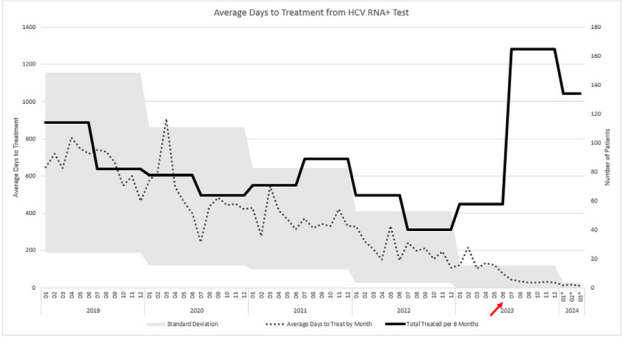
Study Objectives: US emergency departments (EDs) have proven to be high-yield venues for the detection of hepatitis C virus (HCV) infection; however, the overall effectiveness of these programs have been challenged by low linkage-to-care and treatment uptake rates from those identified with HCV infection. To improve treatment uptake and time to treatment for persons identified with HCV infection in the ED, we developed an ED-based HCV treatment program utilizing specialty pharmacists and advanced practice provider (APP) working under collaborative care agreements with ED attendings. Here, we present methods and early results from our novel ED-based HCV treatment program, the **CURES** model (**C**ascade **U**tilizing **R**outinized screening through treatment to **E**liminate **S**yndemics). The primary outcome is to compare HCV treatment rates and time to treatment before and after the implementation of our novel treatment program on June 23, 2023. Secondary outcomes are clinical and demographic characteristics of patients evaluated for treatment after implementation of our program.

Methods: In our urban, academic ED, HCV-infected persons are identified through HCV-antibody (Ab) testing during the ED visit or though previously performed HCV serologies. During the ED visit and for all persons identified with HCV infection, our pharmacists perform a standardized HCV workup following AASLD/IDSA guidelines, including: fibrosis assessment, co-infection screening, vaccination administration, opioid use disorder screening, and pre-treatment education. All patients with diagnosed with decompensated cirrhosis, HCV treatment experienced, or who are co-infected with HIV and/or hepatitis B virus (HBV) are referred to specialists for further management. For uncomplicated cases of HCV infection amenable to a "simplified treatment" protocol endorsed by AASLD/IDSA, the ED APP provides HCV prescriptions through an in-person or telehealth follow-up visit.

Results: Prior to the implementation of the novel HCV treatment program from June of 2018 to May of 2023, 10.98% (557/5,116) of HCV-infected persons identified in the ED received HCV treatment. By comparison, after the implementation of our novel treatment program from June 23, 2023 until March 31, 2024, HCV treatment rates rose to 58.5% (258/441). Similarly, average time to treatment initiation fell from 421 days (SD = 401 days) prior to implementation to 28 days (SD= 31 days) post-implementation. (Figure 1) Among the total 441 confirmed chronically HCV infected persons identified in the post-implementation period, 395 were eligible for "simplified treatment" strategy, and 258 (65.3%) started HCV treatment. Of those eligible for simplified treatment, the median age was 42 (Range 19-77) with 86.5% born after 1965, 95.8% were white, 75.2% had Medicaid and the average Fibrosis-4 score was 0.99. Among the 46 persons ineligible for a "simplified treatment" strategy and in need of referral to specialty care, 9 were on previous direct acting antivirals, 14 had advanced liver disease, 11 were HBV infected, 11 were incarcerated and 1 was HIV infected.

Conclusions: Our ED pharmacist-based HCV model of care significantly improved treatment uptake rates while simultaneously decreasing time from diagnosis to treatment. To our knowledge, this is the first ED program to identify HCV infected individuals, perform HCV-related treatment workup, and initiate HCV treatment from ED providers. Successes of this model have implications for US HCV elimination efforts.



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66 Post-Shift Electronic Health Record Work Is Associated With Decreased Personal Accomplishment

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Study Objectives: Emergency department (ED) providers frequently suffer from burnout. The electronic health record (EHR) has been implicated in burnout in healthcare, but there are few studies focusing on how ED providers' interactions with the EHR may be related to burnout. Audit logs, timestamped records of EHR actions, may be secondarily used to analyze EHR workflow. Using audit logs, we sought to understand how the timing (during a shift, directly following a shift, and after leaving a shift) and content (performed on providers' primary patients or not) of EHR actions may contribute to burnout.

Methods: EHR audit logs, patient visit data, and shift schedules were retrospectively obtained at an urban tertiary care academic medical center. Only full-time attending physicians were included in the study. Audit log actions occurring during working hours as defined by the department schedule were described as "during shift". Actions occurring following the end of a shift were considered "post-shift", while actions occurring after a break of at least one hour of EHR activity after a shift ended were deemed "out-of-hospital". Each action was also categorized as pertaining to patients the provider was primarily responsible for versus all other EHR actions by comparing the medical record number associated with the audit log action, if present, to the provider to whom the relative value units for the visit were attributed. Burnout was determined using the three components of the Maslach Burnout Inventory (MBI) (emotional exhaustion, depersonalization, and personal accomplishment), with audit log data for a one year period leading up to the completion of the MBI being included in the study. Pearson correlations were used to compare each component of the burnout score and the number of actions performed on primary patients versus other EHR actions within each time frame (ie, "during shift" primary patient actions, "during shift" non-primary patient actions, "post-shift" primary patient actions, "post-shift" non-primary patient actions, "out-of-hospital" primary patient actions, and "out-of-hospital" non-primary patient actions). Python 3.9.12 was used for the data analysis and R 4.2.1 was used for the statistical analysis.

Results: There were 10 participants with audit log data from 2/1/2020 to 7/12/2021. A total of 2,148,234 audit log actions were obtained, with 1,160,814 actions occurring on patients who were the primary responsibility of the provider and 987,420 actions either occurring on other patients or not being associated with a medical record number. 1,807,157 EHR actions occurred "during shift", 63,871 occurred "post-shift", and 277,206 occurred "out-of-hospital". Mean MBI scores across participants did not meet criteria for burnout. "Post-shift" actions that were performed on primary patients (correlation -0.64, $p=0.048$) and "post-shift" actions not performed on primary patients (correlation -0.68, $p=0.032$) were correlated with decreased personal accomplishment. Other analyzed categories of EHR actions were not found to be statistically significant when compared to components of the MBI.

Conclusions: ED EHR work contiguously following a shift is associated with decreased personal accomplishment. "Work outside of work" (ie, "pajama time") is a common metric used to understand the role of EHR work in burnout, however our study suggests that a more granular analysis of the timing of actions may provide additional nuance in understanding the effect of "staying late" rather than "working at home" and its impact on clinician well-being (eg, burnout). Further research is needed to understand the nature of this relationship and what may contribute to post-shift work.

No, authors do not have interests to disclose

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67 EMERGENT: Emergency Medicine Resources and Guidelines Enhanced by Natural Language Text-Generation

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Study Objectives: The EMERGENT Engine was developed to address an information gap in emergency medicine with respect to retrieval of high quality evidence for clinical practice, using a retrieval augmented generation (RAG) method with an underlying state of the art large language model. One of the major current limitations of large language models (LLMs) is that they do not consistently deliver reliable information for medical decision-making. The aim here was to align LLM outputs with nationally accepted clinical policies or published literature and provide traceable sources for the information presented, improving the reliability and acceptance of LLM generated output for bedside clinical decision making.

Methods: Physicians interact with the system using a web interface to ask clinical questions. We use a GPT-4 (Generative Pretrained Transformer) based model, enhanced by the ChromaDB (Chroma Database) RAG framework to ground the responses in relevant literature. The system initially attempts to answer the query using ACEP Clinical Policy Guidelines using cosine similarity to determine a potential source document (clinical policy guideline). The similarity threshold was crafted using clinical questions that were embedded in the guidelines themselves. Once a target document is established, the matching document and question are fed into the GPT-4 based model with the two prompts shown in Figure 1.

{rag_data[0]} are the pieces of the document that are relevant to the prompt. The first prompt creates a short paragraph with background information. The second prompt creates a series of bullet points with actionable steps. If no clinical policy matches, we search PubMed using PyMed and also use cosine similarity, with a threshold of 0.3 to find relevant PubMed documents, and insert those documents in a similar fashion. The output is a list of patient management recommendations or retrieved information summaries which are paired with sources via superscript for traceability. User feedback is currently being systematically collected through a panel within the interface, asking to rate the helpfulness of responses, estimate time savings, and provide additional comments.

Results: We present the cosine similarity statistics regarding all the questions embedded within the ACEP clinical policy guidelines (eg, "In adult patients presenting to the emergency department with suspected acute heart failure syndrome, is the diagnostic accuracy of point-of-care lung ultrasound sufficient to direct clinical management?") with respect to how well they match across all the guidelines:

Similarity Score Statistics: Mean: 0.5807813601010101 Minimum: 0.30818203 Maximum: 0.750641 Standard Deviation: 0.08014671494339667 (Figure 2).

Conclusion: EMERGENT Engine significantly enhances the reliability and utility of LLMs in EM by aligning them with established ACEP clinical policy guidelines or literature from PubMed. This approach creates a tiered system where we attempt to efficiently answer clinical queries similar to emergency physicians' approach - first by interfacing with ACEP Clinical Policy Guidelines and if necessary, searching available literature from PubMed. One limitation of this study is the lack of access to sources intermediate to ACEP clinical policy guidelines and PubMed such as UpToDate, Dynamed and other expert curated services. These services are widely used by physicians, but they disallow 'text mining' type systems. Additionally, using the questions embedded in the guidelines themselves to determine a cosine similarity threshold is a conservative approach, and it is likely that questions exist that could have been answered by the ACEP guidelines that were answered using PubMed instead. Our system addresses crucial gaps in medical evidence delivery and incorporates a feedback mechanism for ongoing improvement.

Prompt 1: You are an assistant in the ER. The doctor has the following question below. Take into account the information below while producing your responses. Include only aspects that are useful to a doctor trying to determine the best course of action in the ER. Be concise, concrete and actionable. Do not write more than 3 sentences. Make sure your response is in actionable statements and NOT in numbered lists or bullet points: {rag_data[0]}

Prompt 2: You are an assistant in the ER. The doctor has this question: {input}. Keeping in mind the data below, produce a produce a response to the input. Specifically, identify the next 3 - 7 steps that need to be taken. The steps need to be easy to read during emergency/stress situations. Be concise. Only use relevant information for emergency room advice. Format it in a list like this and ONLY in a list like this: ["bulletpoint1","bulletpoint2","bulletpoint3"]

Figure 1

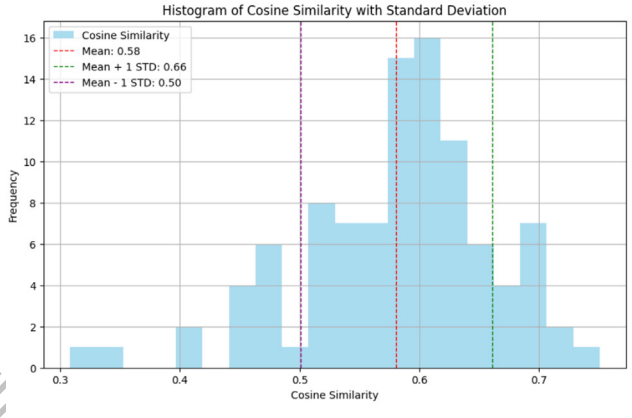

Figure 2

No, authors do not have interests to disclose

68 Leveraging Probability Theory and Machine Learning to Reduce Diagnostic Uncertainty

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Study Objective: Machine learning (ML) has become a key tool for decision-making in emergency medicine where diagnostic uncertainty is a major challenge due to the complexity and variability of clinical data. However, ML often grapples with the inherent uncertainties of medical data, which can be ambiguous, incomplete, or inherently probabilistic. To address this, our study integrated expected value theory from probability theory into ML methodologies to enhance ML model performance and produce more accurate, evidence-based clinical insights in the emergency department.

Methods: The MIMIC-IV database was utilized to calculate patient similarity scores from vital signs and chief complaints, making use of cosine similarity and Levenshtein distance, respectively. Expected values theory was then used to generate probable diagnoses and acuity levels. To evaluate the effectiveness of expected values, ML models were developed and their classification accuracy was compared in scenarios with and without the incorporation of expected values. The control group for this comparison consisted of standard ML models that did not integrate expected values.

Results: The classification accuracy of a conventional random forest classifier model without expected values was 0.605 while the accuracy of rounded expected values alone was 0.690. The incorporation of expected values into the random forest model enhanced classification accuracy to 0.701 with feature importance analysis revealing expected values as the foremost feature in classification.

Conclusion: This study demonstrates the impact of integrating expected value calculations with ML techniques in emergency medicine. Incorporating these methods into the ML model improves accuracy in predicting patient acuity levels, providing emergency room physicians with a more precise and efficient tool for patient assessment. This approach has the potential to enhance patient triage and diagnosis effectively, leading to improved care in emergency settings.

Yes, authors have interests to disclose

69 A Comprehensive Catalog of Emergency Medicine Applications of FDA-Regulated Artificial Intelligence-Enabled Products

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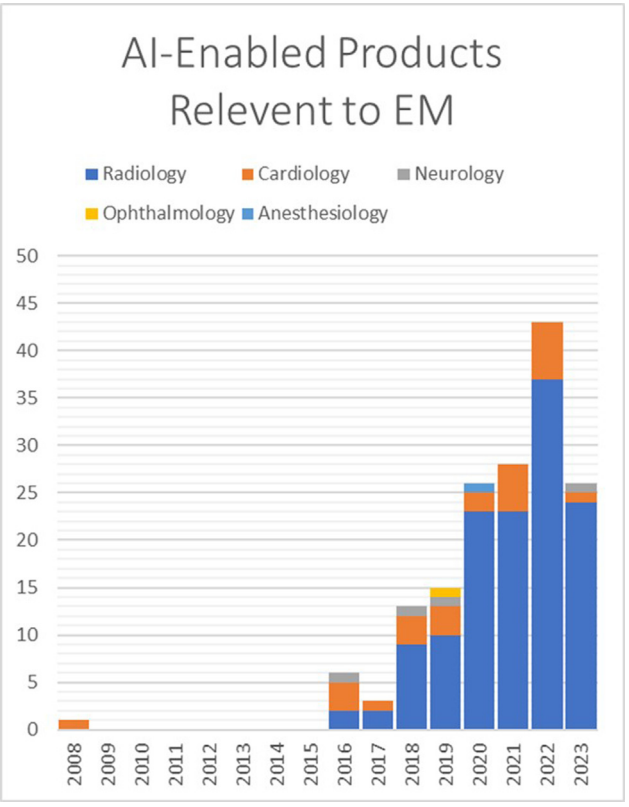
Study Objectives: Products incorporating artificial intelligence (AI) are increasingly used in clinical settings. The U.S. Food and Drug Administration (FDA) regulates those meeting the definition of a device, which are intended for use in the diagnosis or cure, mitigation, treatment, or prevention of disease or other conditions. The FDA reviews products through 510(k) clearance, De Novo requests, or Premarket Approvals with input from specialty specific panels. Interestingly, an Emergency Medicine (EM) panel does not exist. Our objective is to analyze currently marketed devices that incorporate AI and are potentially applicable to EM, including their intended use, most closely related specialty, as well as predicted risks.

Methods: The FDA AI-enabled medical devices website was accessed to identify all marketed products as of December 6, 2023. Product summaries were reviewed to obtain indications for use and product descriptions. Two board-certified emergency physicians analyzed all products for relevance to EM practice, based on a standardized rubric. A third reviewer resolved any disagreements. Inclusion criteria included products used by emergency physicians directly or non-emergency physicians participating directly in the evaluation and management of patients in an acute care setting. Exclusion criteria included products not specifically used in acute care settings or that do not diagnose specific acute pathology. Products were categorized by reviewing specialty panel and risk level.

Results: A total of 692 AI-enabled products have been reviewed by the FDA from 1995-2023. There were three class III (requiring premarket approval) products and the remainder were class II (mostly exempt from pre-market notification requirements). Products were most commonly primarily evaluated by Radiology (531/692), Cardiology (71/692), and Neurology (20/692) panels. We found 161 (23%) products relevant to EM that were approved through Radiology (130/161), Cardiology (25/161), Neurology (4/161), Ophthalmology (1/161), and Anesthesiology (1/161) panels (Figure). Most of these products are related to optimization of diagnostic processes.

Conclusion: An increasing number of AI-enabled products are available and regulated by the FDA. We have identified 161 AI-enabled products that are relevant to the practice of EM, mostly related to assisting with diagnosing pathology on various imaging modalities. Future areas of research include a framework to evaluate the impact that specific AI-related products may have on EM.



No, authors do not have interests to disclose

71 Examining Outliers: Using Advanced Informatics to Inform Novel Process Improvement

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Study Objective: Most Quality and Patient Safety metrics are represented in aggregate averages. In both clinical operations and health science research, means and medians are typically the foci of performance opportunities and intervention impact measurement. The frequency of "outliers," events defined by their substantial deviation from average performance, may provide important alternate substrate for quality performance measurement, process improvement and patient safety goals. The primary objective of this study was to utilize advanced informatics to examine the frequency and etiology of emergency department (ED) diagnostic CT imaging studies that performed 2.5 standard deviations above the department's mean time-to-completion (TAC).

Methods: This was a retrospective, observational study conducted at an urban, quaternary care academic medical center, treating approximately 70,000 adult ED patients annually. All ED patients > 18 years who underwent diagnostic CT studies over 2023 were included. Using electronic health record data and Performance Bridge, a Phillips Healthcare analytics tool, an "outlier dashboard" was constructed to graphically and numerically represent TAC of ED CT studies, defined as the interval from when the order was placed, until the examination was completed. Outliers, defined as cases with a TAC 2.5 standard deviations above the mean, were represented both individually and in aggregate frequency, by hour of day and day of week. An unblinded abstractor performed detailed individual chart reviews of 150 outliers from October to November 2023, achieving thematic saturation for the most common reasons of delays.

Results: Over 2023, a total of 40,193 CT studies were performed in adult ED patients, with a mean TAC of 120 minutes. 2,910 (7.2%) of the studies had outlier TAC, on average 514 minutes. Nine common themes for delays in CT imaging were identified: CT scanner demand strain, transport delays (>30 minutes), critical condition, contrast allergy pre-treatment, delay in radiology report, operative planning, awaiting creatinine & pregnancy test, and difficult vascular access. Collectively, 155 reasons were identified, with some cases having multiple reasons for delays. CT

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demand strain and transport delays accounted for approximately 70% of outliers. Outliers contributed to approximately 1,300 hours of increased ED LOS per month. CT demand strain and transport delays contributed to approximately 920 hours increased ED LOS per month.

Conclusion: This study describes a novel, advanced informatics-based approach to examining performance of clinical processes where efficiency is the priority quality variable. Identifying themes of delays in ED diagnostic imaging through outliers cases may help design interventions to improve operational efficiency and patient-centered outcomes. Future studies will assess the multidimensional impact of quality improvement initiatives focused on reducing the outliers events.

No, authors do not have interests to disclose

72 Injuries Related to Non-Powder Firearms: A National Database Study

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Background: Non-powder firearms (NPF), including pneumatic air, pump, bb, pellet, or airsoft guns, have become increasingly popular for target shooting, hunting, competitive sports, and recreational activities. Concerns about safety and injuries prompted this study to investigate the incidence, patterns, and characteristics of NPF-related injuries.

Study Objectives: In this study, we sought to analyze the demographics and epidemiology of NPF injuries by examining trends over the last decade and identify associated risk factors.

Methods: A data search was conducted through the National Electronic Injury Surveillance System (NEISS) from January 2013- December 2022 to analyze NPF related injuries. The data was reviewed by various parameters such as year of injury, gender, age, location, and affected body part.

Results: Between 2013 and 2022, the NEISS database recorded 3,859 emergency visits related to non-powder firearms, with the majority being males (82%) and the median age of injury being 15. The most common source of injuries was from gas, air, or spring powered guns, accounting for 66% of cases. Facial injuries were the most prevalent type of injury, accounting for 20% of the injuries. This was followed by eyeball and hand injuries (each 13%). The majority of individuals (90%) underwent treatment, examination, and subsequent release from the emergency department, while the remained were held for observations (0.5%), admitted (5%), transferred (2.5%), or left against medical advice (2%)

Conclusions: Despite operating at lower pressures than traditional firearms, NPFs still pose significant health risks, with technological advancements increasing the potential for serious injuries, such as blindness or neurological deficits. Special attention should be given to preventing facial injuries, particularly among teenagers, by enforcing safety measures and using protective equipment.

Figure Legends

Figure 1. Top ten most common sites of injury by percentage of total injury between males and females

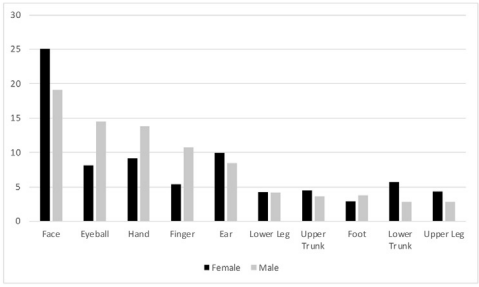


Figure 2. Percentage of total reported injuries by known locations

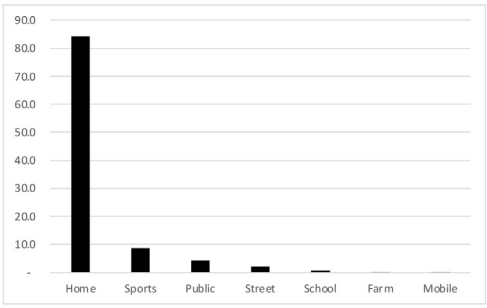
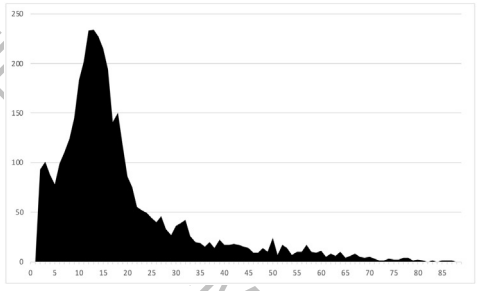


Figure 3. Number of individuals within each age group (years) with reported injuries



Tables

Table 1. Study Demographics. *(#) indicates percent of total demographic.

Sex	Male			Female				Total	
	3127(82)			687(18)				3859	
Race	White	Black	Asian	American Indian/ Alaskan	Hawaiian/ Pacific Islander	Other		Not specified	
	1749(45)	633(16)	20(<1)	25(<1)	5(<1)	286(7)		1141(30)	
Injuries by Age Decade	1st	2nd	3rd	4th	5th	6th	7th	8th	9th
	838(22)	1896(49)	507(13)	253(7)	140(4)	125(3)	67(2)	26(<1)	7(<1)
Age Range (years)	1-88								

No, authors do not have interests to disclose

73 Subclinical, Long-Term Psychological Symptoms Following Sport-Related Concussion: Are Athletes More Depressed Than We Think?

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Background: In adolescent and collegiate athletes with sport-related concussion (SRC), we sought to evaluate the prevalence and predictors of long-term psychological symptoms.

Methods: A cohort study was conducted of athletes 12–24-year-old diagnosed with SRC between November 2017 and April 2022. Athletes/proxies were interviewed on psychological symptoms (ie, anger, anxiety, depression, and stress). Participants who scored ≥75th percentile on one or more PROMIS (Patient-Reported Outcomes Measurement System) measures were operationalized to have subclinical, long-term psychological symptoms. Uni/multivariable regressions were used.

Results: Of 96 participants (60.4% male), the average age was 16.6 ± 2.6 years. The median time from concussion to interview was 286 days (IQR: 247–420). A total of 36.5% athletes demonstrated subclinical, long-term psychological symptoms. Univariate logistic regression revealed significant predictors of these symptoms: history of psychiatric disorder (OR = 7.42 95% CI 1.37,40.09), substance use (OR = 4.65 95% CI 1.15,18.81), new medical diagnosis since concussion (OR = 3.43 95% CI 1.27,9.26), amnesia (OR = 3.42 95% CI 1.02,11.41), other orthopedic injuries since concussion (OR = 3.11 95% CI 1.18,8.21), age (OR = 1.24 95% CI 1.03,1.48), days to return-to-play (OR = 1.02 95% CI 1.00,1.03), and psychiatric medication use (OR = 0.19 95% CI 0.05,0.74). Multivariable model revealed significant predictors: orthopedic injuries (OR = 5.17 95% CI 1.12,24.00) and return-to-play (OR = 1.02 95% CI 1.00,1.04).

Conclusions: Approximately one in three athletes endorsed long-term psychological symptoms. Predictors of these symptoms included orthopedic injuries and delayed RTP.

Table 5. Predictors of subclinical long-term psychological symptoms.

	Univariable Model							Multivariable Model						
Measures	B	S.E.	Wald	df	p	Exp (B)	95% C.I. Exp (B)	B	S.E.	Wald	df	p	Exp (B)	95% C.I. Exp (B)
Age	0.21	0.09	5.42	1	**.020**	1.24	1.03–1.48	0.02	0.25	0.00	1	.952	1.02	0.62–1.67
Gender	0.82	0.43	3.70	1	.054	2.28	0.98–5.29							
History of Psychiatric Disorder	2.00	0.86	5.43	1	**.020**	7.42	1.37–40.09	3.81	3.11	1.50	1	.221	45.14	0.10–20087.04
Family History of Psychiatric Disorder	0.75	0.64	1.39	1	.238	2.11	0.61–7.34							
Number of Prior Concussions	0.02	0.27	0.00	1	.955	1.02	0.60–1.73							
Initial Post Concussion Symptom Score	0.01	0.01	0.65	1	.420	1.01	0.99–1.03							
Repeat Concussion	0.79	0.59	1.80	1	.180	2.19	0.70–6.92							
Other Injuries	1.14	0.50	5.26	1	**.022**	3.11	1.18–8.21	1.64	0.78	4.41	1	**.036**	5.17	1.12–24.00
New Diagnosis	1.23	0.51	5.92	1	**.015**	3.43	1.27–9.26	0.49	1.02	0.24	1	.628	1.64	0.22–12.11
Substance use	1.54	0.71	4.63	1	**.031**	4.65	1.15–18.81	−1.60	3.37	0.23	1	.635	0.20	0.00–147.70
Psychiatric Medications	−1.69	0.70	5.73	1	**.017**	0.19	0.05–0.74	4.30	3.30	1.70	1	.192	73.90	0.12–47196.17
Loss of Consciousness	0.38	0.81	0.23	1	.634	1.47	0.30–7.12							
Amnesia	1.23	0.62	3.99	1	**.046**	3.42	1.02–11.41	1.06	0.85	1.54	1	.214	2.88	0.54–15.30
Days to Return-To-Play	0.02	0.01	4.21	1	**.040**	1.02	1.00–1.03	0.02	0.01	5.15	1	**.023**	1.02	1.00–1.04

No, authors do not have interests to disclose

74 Extreme Environmental Temperatures and Heat Stroke Presentations in Phoenix, Arizona

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Study Objectives: Climate change has resulted in an increased severity and duration of heat exposure worldwide. The 2023 heatwave in Phoenix, Arizona, the longest and hottest in local recorded history, provides a unique opportunity to better describe the impact of environmental heat on emergency department (ED) heat associated illness presentations. The objective of this study is to describe the association between extreme environmental temperatures and heat associated illness at a single hospital system during the 2023 heatwave in Phoenix, Arizona.

Methods: This is a retrospective observational study of local environmental temperatures and adult ED encounters with temperature (temp) ≥ 40.0°C, attributable to heat exposure, with central nervous system dysfunction occurring between June 1, 2023, and August 31, 2023, to a single hospital system in Phoenix, Arizona. National Weather Service environmental maximum (Tmax), minimum (Tmin) temperatures, and Heat Index, alongside ED heatstroke patient demographics were collected through chart extraction. A descriptive analysis was performed with confidence intervals and p-values where appropriate. The analyses are exploratory, and therefore p-values are not corrected for multiple hypothesis testing.

Results: Of the 26,154 total adult ED encounters occurring during the study window, 54 were determined to meet inclusion criteria. 21 (38.9%, 26.6-52.3% 95% CI) of the heat stroke patients did not survive to hospital discharge. The median environmental daily Tmax and Tmin during the study window was 111.0°F (106.0-114.0°F IQR) and 87.0°F (78.0-92.0°F IQR). Figure 1. demonstrates the daily heatstroke survivors, deaths, and environmental Tmax and Tmin. 44 (81. 5% 68.6-90.7% 95% CI) of the heatstroke presentations occurred in July, including 20 (95.2%, 76.2-99.9% 95% CI) of the total study population deaths. The average July Tmax and Tmin were 114.7°F (113.7-115.7°F 95% CI) and 90.8°F (89.4-92.2°F 95% CI), respectively. The highest daily Tmax of 119°F occurred on July 19, 20, and 25. The absolute heatstroke mortality for these dates was 1 (4.8%), 3 (14.3%), and 1 (4.8%), respectively. The highest daily Tmin was 97°F and occurred on July 19. 2023 Heat Advisory dates were June 13 – June 19, July 1 – July 29, August 4 – August 7, August 16 – August 17, and August 26 – August 30. 19 (90.5%, 71.2-98.4% 95% CI) of the total heatstroke deaths occurred during Heat Advisory dates. Potential associations were demonstrated between daily maximum temperature (p=0.046), daily minimum temperature (p=0.045), and heat index (p=0.034).

Conclusion: Rising temperatures worldwide are associated with increasing heat illness. In this study, we found a potential association between heat stroke deaths and environmental Tmax, Tmin, and Heat Index. Further, the ED presentations were clustered in July and during Heat Advisory dates. Additional studies are needed to better quantify the additional burden of heat illness beyond mortality alone.

No, authors do not have interests to disclose

75 Factors Associated With Disposition Among Patients With Burn-Related Injuries Presenting to the Emergency Department From 2016 – 2023

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Study Objectives: Annually over 400,000 patients present to the emergency department (ED) with burn-related injuries (BRI), with an estimated 29,000 of these patients requiring hospital admission. Burns result in significant morbidity and mortality, especially when severe, with 3,300 deaths each year being associated with burns. This study seeks to assess prognostic factors impacting disposition among patients presenting to the ED with BRI.

Methods: The National Electronic Injury Surveillance System (NEISS) was queried for patients presenting with BRI (Diagnosis Code = 51) in a consolidated database spanning the years 2016 through 2023. Comparisons between demographic, injury, and dispositional variables was conducted using two-sided Fisher's Exact testing with post-hoc z-testing to compare column proportions, with p-values adjusted via the Bonferroni method (comparisons with p-values < 0.001 are denoted with an (*) symbol). Patient age was assessed both as a categorical variable (age < 65 years vs ≥ 65 years) and as a continuous variable compared via two- sided Student's t-tests with p < 0.05 indicating statistical significance.

Results: 19,703 patients > two years of age at presentation to the ED with BRI were identified. Of this group, 76.3% were treated and subsequently discharged from the ED, 15.2% were admitted and eventually discharged, 5.5% were transferred to another institution, and 0.2% died after presenting to the ED. The difference either left without being seen or were held for observation. Compared to patients that were treated and subsequently discharged, those that were admitted were more likely to be male (70.0% vs 56.3%*), White (57.0% vs 47.2%*), be ≥ 65 years (18.4% vs 6.8%*),

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and have a BRI with associated with either alcohol use (3.8% vs 0.7%*) or drug use (6.7% vs 1.3%*). Furthermore, patients with burns to the upper trunk (12.0% vs 3.3%*) or face (26.4% vs 11.4%*) were more likely admitted. Admitted patients were more likely to have sustained an injury from gasoline (13.5% vs 5.2%*) or a housefire (12.0% vs 1.6%*). Results are summarized in Table 1. Mean age of admitted patients was 44.3 years vs 30.0 years for those discharged from the ED ($p < 0.001$). Patient age $\geq$ 65 years was associated with increased risk of fatality (53.1% vs 46.9%* of all fatalities), while sex ($p = 0.19$), race ($p = 0.33$), and concomitant alcohol ($p = 1.00$) or drug use ($p = 0.55$) were not. Fatal burns were more likely to occur on the face (26.5% vs 14.8%; $p = 0.021$) or over the entire body (42.9% vs 0.4%*). Housefires accounted for 79.6% of fatalities compared to 3.6% of all non-fatal injuries ($p < 0.001$). Mean age of patients that died after presenting to the ED was 59.0 years vs 32.1 years for those admitted and subsequently discharged from the ED ($p < 0.001$).

Conclusion: Patients that are White, male, $\geq$ 65 years at presentation, have BRI to the upper trunk or face, or that are using alcohol or drugs at time of injury were found to have increased rates of hospitalization after presenting to the ED with BRI. Furthermore, patients $\geq$ 65 years or with BRI to the face or entire body had increased mortality. Housefires and gasoline-related BRI were leading causes of admission and death. Socioeconomic and insurance-related factors may influence admission rates. ED providers should consider these factors in conjunction with guideline-directed treatment among patients presenting to the ED with BRI, and further investigation into the underlying etiology and potential mitigation of these factors is warranted.

Table 1: Factors Associated with Admission after Presenting with Burn Injury

Comparison	Treated and Discharged from ED	Admitted, Treated, and Discharged	Significance
Male Sex	56.3%	70.0%	p < 0.001
White	47.2%	57.0%	p < 0.001
Age ≥ 65 years	6.8%	18.4%	p < 0.001
Burns to Upper Trunk	3.3%	12.0%	p < 0.001
Burns to Face	11.4%	26.4%	p < 0.001
Burns to Hand	32.7%	13.2%	p < 0.001
Burns to Finger	12.0%	1.5%	p < 0.001
Concomitant Alcohol Use	0.7%	3.8%	p < 0.001
Concomitant Drug Use	1.3%	6.7%	p < 0.001
Injury from Gasoline	5.2%	13.5%	p < 0.001
Injury from Housefire	1.6%	12.0%	p < 0.001

No, authors do not have interests to disclose

77 Impact of Sex and Age on Various Brain Biomarkers Serum Levels Following a Mild Traumatic Brain Injury: A Prospective Cohort Study

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Study Objective: Traumatic brain injuries (TBIs) constitute a significant portion of the national and global injury burden. Approximately 90% of TBIs are classified as mild, and their incidence varies with sex and age. Substantial research has led to the discovery of multiple brain biomarkers, notably S-100ß protein, glial fibrillary acidic protein (GFAP), neuron-specific enolase (NSE) and C-Tau, with the potential to improve the understanding, clinical management and prognostication of TBI. Considering the known impacts of sex and aging on the brain, we hypothesized that these factors may also affect the serum levels of these brain biomarkers following a mild TBI. In this study, we aimed to investigate the impact of sex and age on S-100ß, NSE, C-Tau and GFAP serum levels following a mild TBI.

Methods: We performed a secondary analysis of the PoCS prospective multicenter study, which was conducted across seven Canadian academic emergency departments (EDs) (Level-I and Level-II trauma centers). Patients $\geq$ 14 y/o with a documented mild TBI having occurred within 24 hours of the ED visit and subsequently discharged (not admitted) were recruited. Clinical and demographic data were collected by the emergency physician and a blood sample was obtained by a nurse. The serum concentrations of S-100ß, NSE, C-Tau and GFAP were measured using enzyme-linked immunosorbent assay (ELISA). Differences in biomarkers medians between biological sexes were assessed using the chi square test or Fisher's exact test, and Pearson correlation was employed to analyze continuous biomarker values in relation to age.

Results: A total of 1,314 patients were recruited of whom 1,118 (85,1 %) were < 65 y/o, and 806 (61,3 %) were male. Falls were the predominant mechanism of injury in both younger (22,9%) and older (48,4%) populations followed by sports (21,3%), motor vehicle accidents (17,3%) and bicycle accidents (14,1%) in the < 65 y/o population, and bicycle accidents (12,6%), sports (8,9%) and motor vehicle accidents (5,3%) in the $\geq$ 65 y/o population. 6,0% had a traumatic intracranial hemorrhage. The mean concentrations of each biomarker were: 68,5 pg/mL for S-100ß, 218,7 pg/mL for NSE, 2771,2 pg/mL for C-Tau and 2838,5 pg/mL for GFAP. The median concentrations for each biomarker for males and females respectively were: 43,8 pg/mL and 41,2 pg/mL for S-100ß ($p = 0,27$), 50,0 pg/mL and 50,0 pg/mL for NSE ($p = 0,02$), 2690,2 pg/mL and 3460,7 pg/mL for C-Tau ($p < 0,0001$), and 1469,3 pg/mL and 2042,6 pg/mL for GFAP ($p < 0,0001$). When analyzed in relation with age as a continuous variable, no significant differences in serum levels were observed between the mean and median levels for the four studied biomarkers between males and females. Age as an independent continuous variable did not influence the biomarkers serum levels either.

Conclusion: Our prospective cohort study indicates that sex and age did not influence the circulating serum levels of biomarkers following a mild TBI. This study addresses an important question prior to the implantation of biomarkers for the diagnosis, follow-up, treatment, and prognostication of patients suffering from mild TBI.

No, authors do not have interests to disclose

78 Glial Fibrillary Acidic Protein and Ubiquitin C-Terminal Hydrolase-L1 as Potential Blood Biomarkers for Intracranial Hemorrhage in Mild Traumatic Brain Injury

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Background: Mild traumatic brain injury (mTBI) is one of the major public health issues as it is common and has a risk of serious sequelae. The definition of mTBI is based on the Glasgow Coma Scale (GCS) of 13-15 and does not require a normal head computed tomography (CT). Biomarker serum levels of glial fibrillary acidic protein (GFAP) and ubiquitin C-terminal hydrolase-L1 (UCH-L1) may provide additional data to the emergency department (ED) clinician, as several studies indicated their potential role for risk stratification and potentially high negative predictive value for serious intracranial pathology detected with standard head CT scan after mTBI. The role of GFAP and UCH-L1 in the risk stratification of patients admitted to the ED with mTBI and intracranial hemorrhage has not been evaluated yet.

Materials and Methods: This ongoing, prospective, monocentric observational study includes all non-pregnant patients (> 18 years old) presenting to the ED within 4 hours of a traumatic event, reporting mTBI (GCS >13). Patients are eligible if they have undergone a venous blood sample and brain CT scans as part of their standard emergency care according to the intra-hospital guidelines and the clinical judgment of the attending physician. The primary endpoint is the sensitivity and specificity of serum biomarkers for intracranial hemorrhage at head CT in patients with mTBI. Continuous variables are reported as median [interquartile range]. Categorical variables are reported as absolute numbers (%). Statistical univariate comparison for primary and secondary outcomes was assessed by the Mann- Whitney U test for continuous variables and the chi-square test (with Fisher test if appropriate) for categorical variables.

Results: Between September 15, 2022, and November 30, 2022, 79 patients with mTBI were recruited. The median age was 73 years [57-82], and median serum values of GFAP and UCH-L1 were 55.7 [28.7- 113.6] and 376,9 [224.9-534.6] respectively. The number of patients who reported an intracranial hemorrhage detected via head CT scan was 11, against 68 patients who resulted negative for intracranial hemorrhage. Median GFAP in patients with intracranial hemorrhage was 129.5 [60.3-369.7], versus 49 [27.2-83.7] in patients with negative head CT scans, a statistically significant difference ($p=0.04$). Similarly, a statistically significant difference ($p=0.10$) was observed in the serum value of UCH-L1 between patients with and without intracranial hemorrhage (848.6 vs 337.0 respectively). Among possible confounding variables, also age was significantly higher in patients with intracranial hemorrhage (median age 82 vs 70, $p=0.022$), but there was no significant difference in sex.

Conclusion: Serum dosage of GFAP and UCH-L1 may contribute to the management of mTBI in the ED setting as potential predictors of intracranial injuries, allowing a risk stratification of patients admitted to the ED with TBI and without serious neurologic impairment at presentation. Currently, available data on the blood biomarkers may support the development of a standardized serum assay, even though further patient enrollment is required.

No, authors do not have interests to disclose

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80 Sensitivity of a 5-Element Cortical Sign Screen for Detecting Acute Basilar Artery Occlusion Stroke

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Study Objectives: Large vessel occlusion (LVO) stroke screens are primarily utilized to identify anterior circulation (AC) LVO ischemic strokes. One such qualitative screen, which assesses for the presence of a visual field deficit, aphasia, neglect, gaze preference or dense hemiparesis (FANG-D), is sensitive for identifying ACLVO. In May of 2018, the FANG-D screen was implemented as an emergency medicine (EM) stroke screening tool throughout our healthcare system's stroke network. The goal of this study was to assess the sensitivity of the FANG-D screen to detect acute basilar artery occlusion (BAO) stroke. Secondarily, we assessed the sensitivity of the National Institutes of Health Stroke Scale Score (NIHSSS) ≥6 for detecting BAO.

Methods: We conducted a retrospective study of confirmed consecutive BAO strokes from May 2018 to February 2024 from a large healthcare system's prospectively maintained stroke network database. The site of BAO (proximal, mid, or distal) was confirmed by a neuroradiologist based on prespecified vascular anatomic criteria. FANG-D screens were performed by the treating emergency physician and the NIHSSS was performed and documented by neurology consultants. GCS scores were those recorded by registered nurses.

Results: We identified 208 BAO patients, of whom 124 had FANG-D screens documented by emergency physicians. Patients without FANG-D screens had significantly lower GCS scores (11, IQR 5-15) than those with screens recorded (14, IQR 8-15). Among BAO patients with a FANG-D screen recorded, the sensitivity of a positive FANG-D screen for detecting BAO was 72.6% (95% CI 64.7-80.4%) and improved to 81.0% (95% CI 69.1-92.8%) for cases undergoing emergent thrombectomy (n=42). FANG-D negative BAO cases had significantly higher GCS scores (15, IQR 14-15) and lower NIH Stroke Scale Scores (3, IQR 2-6) than FANG-D positive cases (12, IQR 7-15 and 14, IQR 5-25 respectively); otherwise, there was no difference in demographics, comorbidities, clinical characteristics, or site of BAO between FANG-D negative and positive patients. The sensitivity of a NIHSSS ≥6 for detecting BAO was 63.7% (95% CI 56.8 – 70.7%).

Conclusion: A qualitative screen comprised of cortical signs lacks sufficient sensitivity to be used alone to screen for an acute BAO. Our findings support the importance of considering acute BAO in patients who present with an unexplained acute comatose-like state and in patients presenting with a NIHSSS <6.

No, authors do not have interests to disclose

81 Dendrimer Nanoparticles Allow for Targeted Localization in a Mouse Model of Intracerebral Hemorrhage: A Vehicle for Treating Secondary Injury

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Study Objectives: Intracerebral hemorrhage (ICH) is a devastating disease with high morbidity and mortality and no specific treatment, in part because of the inability to address injurious neuroinflammation following the initial bleed. Microglia—the resident immune cell of the central nervous system—are a key regulator of neuroinflammation after ICH; thus, targeting microglia with anti-inflammatory drugs could dampen secondary brain injury after ICH. Polyamidoamine dendrimer nanoparticles (hereafter referred to as "dendrimers") have been shown to selectively localize in activated microglia in several animal models of neuroinflammatory and neurodegenerative disorders in various species, delivering drug specifically to microglial cells and attenuating injury. Dendrimers, however, have not been used in an animal model of ICH before. In this study we characterize the temporal uptake and localization of dendrimers in a mouse model of ICH to assess its potential to deliver therapeutics specifically to the inflammatory cells.

Methods: We induced ICH in mice by injecting collagenase into the striatum of the right hemisphere. At 0 hours, 72 hours, 7 days, and 35 days post-ICH, dendrimers tagged with fluorescent Cy5 (D-Cy5) were retro-orbitally injected and allowed to systemically circulate for 24 hours. Mice were then transcardially perfused with saline, and brains were harvested and sectioned. Immunohistochemistry was performed with Iba1 (a marker of microglia/macrophages), GFAP (astrocytes), and DAPI (cell nuclei). Brain sections were imaged using widefield fluorescence microscopy and confocal microscopy to detect D-Cy5 uptake and localization over the multiple post-ICH dosing timepoints.

Results: Here we show, for the first time, that dendrimers selectively localize to the ICH lesion post-injury. Systemically injected D-Cy5 accumulated peri-lesionally as early as 24 hours post-ICH and continued to accumulate in brains when injected up to 35 days post-injury. Far less D-Cy5 was observed on the contralateral side of the brain at all timepoints. D-Cy5 appeared to colocalize with Iba1, which marks microglia.

Conclusion: Dendrimers successfully cross the blood-brain barrier, accumulate peri-lesionally, and selectively localize to activated microglia when systemically dosed after ICH. Strong signal when dendrimer was dosed immediately post-ICH demonstrates the importance of early treatment post-ICH, such as in the emergency department. Yet continued accumulation of dendrimer in ICH lesions even 35 days after injury highlights both the persistence of neuroinflammation post-injury and demonstrates a long potential window for treatment. These findings support the use of PAMAM dendrimer nanoparticles as targeted delivery vehicles after ICH; when loaded with anti-inflammatory drugs, dendrimers may be an avenue of treatment for secondary brain injury in patients with ICH.

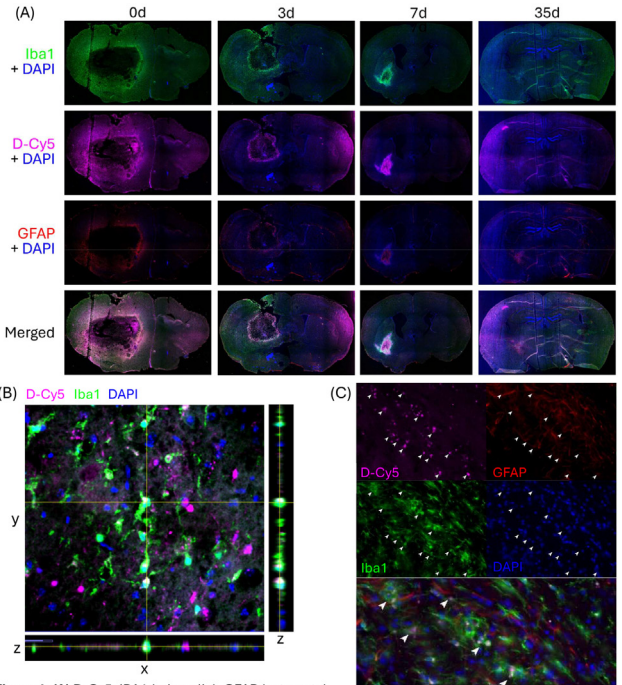

Figure 1: (A) D-Cy5, IBA1 (microglia), GFAP (astrocyte), and DAPI (nuclei) distribution in the brain at different time points post-ICH. D-Cy5 was systemically injected at 0, 3, 7, and 35 days post-ICH and allowed to circulate for 24 hours before brains were perfused and stained. Dendrimer accumulates in the perilesional area.
(B) A representative perilesional z-stack of the 0d timepoint. The orthogonal views show colocalization of dendrimer with microglia, which appears white (overlap of D-Cy5, Iba1, and DAPI) in 3D space.
(C) A representative perilesional widefield microscopy image of the 35d timepoint showing overlap of D-Cy5 and Iba1, suggesting that dendrimer reach targets when given even 35 days post-injury.

No, authors do not have interests to disclose

82 Clinical Performance of Glial Fibrillary Acidic Protein and Ubiquitin C-Terminal Hydrolase L1 for Prediction of Intracranial Injuries on Head Computed Tomography in Mild Traumatic Brain Injury

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Study Objectives: Traumatic Brain Injury (TBI) is a growing public health problem, with an estimated 5 million patients evaluated for TBI in United States emergency departments each year and represents a health care challenge for emergency

department (ED) clinicians. The objective of this study is to assess the diagnostic performance of blood based biomarkers glial fibrillary acidic protein (GFAP) and ubiquitin C-terminal hydrolase L1 (UCH-L1) for predicting intracranial lesions in subjects presenting to the ED with a suspected mild traumatic brain injury (TBI).

Methods: Analysis of archived plasma specimens from a prospectively collected multicenter study was performed to establish the performance of the Alinity i TBI test; a panel of GFAP and UCH-L1 immunoassays. Specimens were collected from individuals 18 years of age and older who presented to a health care facility or ED with suspected TBI within 12 hours of injury. The subjects had an initial Glasgow Coma Scale score of 13-15 and a head CT scan performed per standard of care. Analysis of subjects presenting within four hours of injury was performed relative to the entire cohort presenting within 12 hours of injury.

Results: There were 1,899 mild TBI subjects available for testing and analysis, of which 120 had positive CT scan results. 116 of the 120 subjects with positive CT scan had a positive TBI interpretation using the Alinity i TBI test (Sensitivity 96.7%; 95% CI: 91.7%, 98.7%). Of the 1,779 subjects with negative CT scan results, 713 had a negative TBI interpretation (Specificity 40.1%; 95% CI: 37.8%, 42.4%). The negative predictive value (NPV) of the test was 99.4% (713/717, 95% CI: 98.6%, 99.8%). Further evaluation of the 1,443 subjects who had blood collected within four hours of injury was performed. In this subset, 86 subjects had positive CT scan results. The TBI test had a sensitivity of 97.7% (95%CI: 91.9%, 99.4%). Of the 1,357 subjects with negative CT scan results, 534 had a negative TBI test interpretation (Specificity 39.4%; 95%CI: 36.8%, 42.0%). The NPV was 99.6% (95%CI: 98.6%, 99.9%) for the subjects with blood collected within four hours of injury.

Conclusions: The Alinity i TBI test demonstrated high sensitivity and high NPV to assist in determining the need for a head CT scan in subjects presenting with suspected mild TBI in subjects presenting within 12 hours of injury and earlier. The results support use of blood biomarkers to provide supportive evidence of brain injury.

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Disclosure: Abbott Laboratories

Employee

Abbott Laboratories

83 Sphenopalatine Ganglion Nerve Blocks for the Management of Acute Migraine Exacerbations

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Study Objectives: Migraines are one of the most prevalent emergency department (ED) complaints with over 1.2 million ED visits annually. Currently, the standard of care in the ED for managing migraines is various intravenous agents utilizing valuable ED resources, time, and costs. It is postulated that the sphenopalatine ganglion is implicated in the pathophysiology of migrainous symptoms. Sphenopalatine ganglion blocks (SPG) are sparsely performed in the ED. Our case series seeks to investigate the potential use of non-invasive, needleless SPG blocks in the ED to treat acute migraine exacerbations.

Methods: This is a case series of 7 patients with a history of migraines presenting to the ED for a migraine exacerbation. All patients received SPG blocks for their initial treatment of migraines. To administer the SPG block, patients were placed supine. A 20 gauge, 1.88 inch angiocath sheath without metal introducer was attached to a 10mL syringe and placed on the medial aspect of the septum and advanced posteriorly until resistance was met and then minimally withdrawn off the posterior wall of the nasopharynx. 1.5 mL of 2 % lidocaine was slowly administered over 10 seconds. Patients provided their pain score (on a scale of 0 for no pain to 10 with severe pain) prior to administration and were reassessed at 10, 20, and 30 minutes. Paired T-tests were performed comparing patient pain scores between times 0, 10, and 20 minutes upon SPG block administration.

Results: The average pain score at presentation was 8.8. After performing the SPG block, the average pain score was 3.9 at 10 minutes (56.5% reduction) and 1.6 at 20 minutes (82.2% reduction). There was a statistically significant decrease in pain scores prior to the SPG block and at the 10-minute reassessment, but no difference between the 10-minute and 20-minute reassessments. The average length of stay from triage to discharge was 206 minutes. After the 20-minute reassessment, 71.4% of patients had near complete resolution of migrainous symptoms and requested discharge. The remaining patients had pain scores of 1/10 by the 30-minute reassessment.

Conclusion: Blocks on the sphenopalatine ganglion can be achieved in a non-invasive and needleless method. They are efficacious in decreasing pain in patients with migraine headaches and may have cost as well as resource-utilization benefits. Our case series provides evidence that SPG blocks have a role in the treatment of migraines in the ED.

			Pain Score for each time interval				Pain score difference between reassessments		
Patient	Age	Gender	0 min	10 min	20 min	30 min	0 vs 10 min	10 vs 20 min	20 vs 30 min
1	54	Female	10	4	2	0	6	2	2
2	60	Female	8	4	4	*	4	0	
3	39	Female	10	1	0	*	9	1	
4	48	Female	10	6	1	*	4	5	
5	26	Female	9	2	2	*	7	0	
6	29	Male	7	5	2	1	2	3	1
7	53	Male	8	5	0	*	3	5	

*Patients with decreased pain and requested to be discharged prior to 30 min assessment

No, authors do not have interests to disclose

84 A Year of Laughing Gas in the Emergency Department: A Wide Range of Indications for Nitrous Oxide

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Study Objectives: The aim of this study was to evaluate the efficacy and safety of nitrous oxide (NO) in the emergency department for a wide range of painful procedures.

Methods: This was a retrospective analysis of NO use in our emergency department for painful procedures. Patient charts that included orders for NO were analyzed for efficacy and side effects experienced during and after NO administration. We retrospectively evaluated the use of nitrous as a method of procedural analgesia in our emergency department over a 12-month period. Efficacy was defined as NO use without needing to escalate to procedural sedation. The study took place in a large, high-volume, urban academic emergency department with an annual census of 160,000 patients.

Results: A total of 255 patients were identified using our NO order set on our electronic medical record. Procedures included incision and drainage (91), fracture reduction (76), laceration repair (48), foreign body removal (9), electrical cardioversion (6), fecal disimpaction (4), fracture splinting (3), priapism aspiration (3), hernia reduction (3), arthrocentesis (1), traction pins placement (1), paraphimosis reduction (1), hemorrhoid evaluation (1), pigtail catheter placement (1), nail avulsion repair (1), urethral stone removal (1), wound packing removal (1), circumcision wound evaluation (1), foley catheter placement (1), lumbar puncture (1), paracentesis (1) and nasogastric tube decompression (1). We found nitrous to be efficacious in 93.3% of cases with the remaining 6.7% requiring escalation to procedural sedation or abortion of procedure. None of the cases resulted in hemodynamic instability. Vomiting was reported in one patient, and no side effects were documented on any other patient.

Conclusion: NO has been studied in the literature as an adjunct to conventional pain management in cases such as traumatic injuries, with significant reduction in pain and increased patient satisfaction. In addition to providing analgesia and anxiolysis, NO does not cause hemodynamic instability when compared to other medications commonly used for procedural sedation. The adverse effects most commonly reported are nausea, vomiting and dizziness. At the end of the 12-month period, we found an overall efficacy rate of 93.3%. Side effects were minimal, with one case resulting in the patient vomiting, and no adverse effects seen in any of the other patients. Limitations of our study include its retrospective nature and the lack of standardized documentation by providers. We conclude that NO is an effective and safe alternative for procedural sedation, with a high efficacy rate and minimal side effects to the patient.

No, authors do not have interests to disclose

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85 Development of an innovative Erector Spinae Plane Nerve Block Ultrasound Model to Facilitate Training for Emergency Physicians

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Study Objectives: The use of ultrasound-guided regional nerve blocks for acute pain in the emergency department (ED) is an acceptable alternative or adjunct to opioids and other pharmacotherapeutics. Specifically, the use of the erector spinae plane (ESP) nerve block can aid in pain control for trauma patients with acute rib fractures. However, access to adequate tools to facilitate training of various nerve blocks can present a barrier to use. The ESP nerve block model was designed to facilitate training in a hands-on education session for residents and attendings within our ED. Our aim was to increase knowledge, confidence, and skills of the ESP block, and address barriers to use so that it would be commonly considered as a first-line modality for pain control in the ED when appropriate.

Methods: The ESP model was produced by our Simulation Center at the University of South Carolina School of Medicine-Greenville. A 3D printer was used to create a small section of artificial bone to form the spine and ribcage that was then suspended in ballistic gelatin. Ballistic gelatin is the closest artificial equivalent to that of animal tissue; closely simulating its viscosity and density. After the model was created, we completed nine different thirty-minute training sessions over two months with ED residents and ED attending physicians. The training sessions included didactic lectures and hands-on learning with the model. Participants completed an anonymous post-training survey to assess training impact.

Results: A total of 34 participants attended the training session and 14 (41.2%) returned completed surveys. Seven respondents (50%) were resident physicians, and seven respondents (50%) were attending physicians. Twelve (86%) reported they had never performed an ESP block prior to this training session and 2 (14%) reported they performed less than 2 ESP blocks per year. All fourteen agreed or strongly agreed that the education session with the ESP model improved their confidence, knowledge and skills to perform the block. Most (93%) agreed or strongly agreed that they felt confident in the ability to use ultrasound to identify landmarks on the model pertinent to performing the ESP block. All reported that they felt that the material presented during these training sessions was relevant to their practice in the ED, part of their scope of practice, and part of their job as an emergency physician. All felt performing ESP blocks in the ED could positively impact patient outcomes and reported an increased likelihood of performing the ESP block in the ED following this training session. Lastly, respondents were asked to list any barriers that might inhibit them from performing the ESP block on shift, in addition to any strategies to facilitate ESP block use. Four participants reported barriers to performing an ESP block including time constraints (50%) and patient mobility limitations (50%). Twelve participants reported facilitators to performing ESP blocks including easier access to supplies and assistance with procedure set up (43%), followed by increased educations sessions (21%).

Conclusion: A simple 30-minute training session with a novel ballistic gelatin ESP model can improve confidence, knowledge, and skills in performing this block in the ED, even amongst nerve block naive physicians. Additionally, by identifying barriers to use of the ESP block in the ED, researchers can inform strategies to mitigate these challenges to increase utilization of these procedures for appropriate patients in the ED.

No, authors do not have interests to disclose

86 Use of Low-Cost Virtual Reality for Distraction and Anxiolysis During Painful Procedures

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Background: Patient immersion in interactive virtual reality (VR) provides distraction from painful stimuli and can decrease an individual's perception of pain. Randomized controlled trials in 2018 and most recently in 2024 showed VR-based interventions to be effective for reducing pain intensity across various medical procedures. The aim of this study was to compare the effectiveness of a low-cost portable VR headsets (Oculus Go®) to standard of care in improving pain scores and anxiety during painful procedures for both adult and pediatric patients presenting to the emergency room. This study sought to provide high-quality evidence for the utility of VR technology in managing procedural pain and improving anxiety outcomes in the emergency setting.

Methods: This randomized controlled trial was conducted among patients requiring local anesthesia for laceration repair or abscess drainage in an academic emergency department. Patients were randomized to either VR or standard of care, and patients < 6 years, non-consenting patients and those with known VR side effects such as dizziness were excluded. Adults and children above 13 years were administered a Visual Analog Scale (VAS) scale to grade the pain and anxiety level before and after the procedure. Pediatric participants used the Wong-Baker FACES pain scale, administered by trained research staff to assess pain and worry. Data was analyzed using student's t-test to compare change in pain and anxiety between the two groups.

Results: 155 adults and 14 pediatric patients were enrolled for this study. Anxiety significantly reduced by at least 10mm in adults (P=0.008491), although there was no statistically significant change in adult pain scores. Differences in % pain remaining between the VR group and control group in adults neared but did not reach statistical significance (0.099). In children, no statistically significant difference was observed. Pain scores were similar in both groups, and a slight decrease in anxiety (<1 point) was observed (P=0.7949). Combining both study arms using chi-square analysis showed significant odds that pain and anxiety would be reduced by at least one clinical scale point.

Conclusion: This study shows that low-cost VR technology has the potential to reduce anxiety in an adult patient population during painful procedures. While the study was limited by a small pediatric sample size, which may have impacted the ability to detect significant effects, the findings in adults are promising. Further research with larger sample sizes is needed to confirm these results and assess the cost-effectiveness of implementing VR in clinical settings. VR could be a valuable tool for enhancing patient comfort during painful procedures in the emergency department.

No, authors do not have interests to disclose

87 The Impact of Dental Blocks on Emergency Department Revisits: A National Study of Emergency Department Patients With Dental Pain

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Study Objective: Approximately 2 million visits to the emergency department (ED) each year are for dental pain, a number which continues to increase. Most of these cases are straightforward, involving dentistry referral and systemic antibiotics and analgesia. In the setting of the ongoing addiction crisis, opioid sparing analgesic approaches are increasingly promoted, including regional dental analgesia (ie, dental blocks). The transient duration of regional analgesia has prompted concerns that treated patients may be more likely to return to the ED. In this study, we aimed to investigate whether dental blocks for uncomplicated ED dental pain presentations affect the likelihood of 48 hour ED return.

Methods: We performed a retrospective analysis of a national healthcare dataset encompassing more than 180 hospitals and 300 EDs nationwide. We included ED visits from 2018-2022 discharged with non-traumatic dental etiologies (generally K02-K06, K08: cavities, pulpitis, periapical abscess, periodontitis, loss of teeth, and unspecified disorders of teeth) which were assessed as low acuity as defined by Emergency Severity Index level 4 or 5 visits without radiology examinations or laboratory testing and without extreme systolic blood pressure, hyperthermia, or hypoxia for nonpregnant patients aged 18 to 65. Visits ending in non-medically directed discharge and elopement were excluded. We also excluded visits with incision/drainage or aspiration as these cases almost always received local or regional anesthetic and thus violated the positivity assumption of quasi-experimental design. The primary exposure of interest was any anesthetic injection to achieve regional or local dental analgesia. To help control for baseline differences between those receiving and not receiving dental blocks, propensity score models were developed, including age, sex, race, and visit related treatments (antibiotics, narcotic and non-narcotic analgesics). Logistic regression models weighted by inverse propensity scores were used to estimate the effect of an ED-performed dental block on the primary outcome (48 hour return to any dataset ED).

Results: A total of 28,592 eligible visits were identified of which 1,572 (5.5%) involved dental blocks, 20,368 (71.2%) included oral non-narcotic analgesics, 11,524 (40.3%) included oral narcotic analgesics and 16,591 (58.0%) included antibiotics [categories are not mutually exclusive]. Similar proportions received dental blocks by age and sex, but white patients were slightly more likely to receive a block compared to non-white patients (54.1% vs 50.7% of patients receiving and not receiving block were white, respectively; p <0.0001). Those who received dental blocks were less likely to receive oral narcotic analgesics (24.7% vs 41.2%, p < 0.0001), less likely to receive oral non-narcotic analgesics (48.3% vs 72.6%, p < 0.0001) and less likely to receive oral antibiotics (39.6% vs 59.1%, p < 0.0001). Propensity score-weighted models revealed that patients who received a dental block had 72% greater odds of 48 hour return (95% CI: 1.434 - 2.078) compared to those who did not receive a block. Regression analysis also suggested 16% increased odds of 48 hour return for patients who received opioids in the ED and 15% lower odds of 48 hour return for patients receiving antibiotics in the ED.

Conclusion: While ED dental blocks appear to be associated with less opioid use initially for patients with dental pain, patients are also much more likely to return with 48 hours. Future prospective studies are needed to validate these findings.

No, authors do not have interests to disclose

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88 Persistent Opioids Use Among Patients Presenting to the Emergency Department for Pain

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Study Objectives: Prescriptions for opioids have spiked during the past two decades with a resultant increase in opioid-related overdose deaths, dependence, and emergency department (ED) visits related to excessive use. The risks associated with an opioid prescription for an individual patient with acute or chronic pain are still poorly understood and inadequately quantified. The goal of this study was to determine the frequency with which opioid naïve ED patients transition to persistent opioid use after receiving a prescription for an opioid.

Methods: This was a prospective observational cohort study conducted in two EDs in New York City. Adults with acute or chronic pain of any cause who were discharged home with an oral opioid prescription were included in the study. Exclusion criteria were any use of opioids, including tramadol within the previous six months, use of non-prescription opioid, illicit opioid use or hospital admission during the index visit. Research associates interviewed patients during the ED visit and by telephone six months later. Data from the state prescription monitoring database were also reviewed. Persistent opioid use was defined as: six opioid prescriptions filled during the six months subsequent to the ED visit or an average of one/ month. For the purpose of outcome determination, tramadol; anti-tussive and anti- diarrheal agents were not considering opioids. Other outcomes of interest included frequency with which patients filled the ED prescription and frequency with which patients required a subsequent opioid prescription.

Results: Over a 29-month recruitment period starting in July 2020, 701 patients were screened for participation and 699 patients met criteria and were enrolled. Outcome data from the state database were obtained on all 699. Oxycodone-acetaminophen and codeine-acetaminophen combinations were the types of opioids prescribed most-frequently (570/699, 82% and 123/699, 18% respectively). The median (IQR) of morphine milligram equivalents dispensed was 50mg (25, 75mg). During the six-month study period, 76/699 (25%; 95%CI: 21, 28%) patients did not fill any opioid prescription, 390/ 699 (56%; 95%CI: 52 to 60%) filled only the opioid prescription they received in the ED, and 116/699 (17%%, 95%CI: 14, 19%) filled at least 2 opioid prescriptions. Seventeen of the 699 (2.4%, 95%CI: 1, 4%) received six or more opioid prescriptions in the six months.

Conclusion: Persistent use of opioids was rare within 6 months of an ED visit among opioid-naive patients prescribed an opioid for acute or chronic pain in New York City EDs during the years 2020 and 2023.

BASELINE VARIABLES	
Age (years)	
18-44	310 (44%)
45-64	286 (41%)
≥65	103 (15%)
Gender	
Male	310 (44%)
Female	389 (56%)
Location of Pain	
Extremity	305 (44%)
Neck and back	149 (21%)
Abdomino-pelvic	131 (19%)
Face	70 (10%)
Chest	38 (5%)
Headache	6 (1%)
Opioid prescribed	
Oxycodone-acetaminophen	570 (82%)
Codeine-acetaminophen	123 (18%)
Hydrocodone-acetaminophen	1 (0.1%)
Morphine	5 (1%)
Morphine milligrams equivalents dispensed, median (IQR)	50 (25, 75)

SIX MONTH OUTCOMES	
Prescription Filled	
No opioid prescription filled	176/699 (25%)
ED prescription filled	390/699 (56%)
At least 2 opioid prescriptions	116/699 (17%)
Persistent use	
Six or more opioid prescriptions in the six months.	17/699 (2.4%)

No, authors do not have interests to disclose

EMF 89 The Utility of High Dose Buprenorphine in Producing Prolonged Suppression of Opioid Withdrawal

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Study Objective: ED-initiated buprenorphine (BUP) is an evidence-based treatment for opioid use disorder (OUD) that reduces overdose risk and improves outpatient treatment linkage. However, optimal dosing strategies are still under investigation. High-dose BUP (>24mg sublingual [SL]) may reduce opioid withdrawal intensity and cravings both during the ED stay and well after discharge. Prolonged withdrawal suppression would provide additional time for treatment linkage, reducing treatment disruptions due to pharmacy or appointment-related delays. Safety and prolonged treatment effects of high-dose BUP are supported by preliminary studies in which BUP doses from 24-120mg SL were administered in differing settings, including the ED. Similarly, studies show that patients generally tolerate extending the BUP maintenance dosing interval from daily to every 2-3 days by increasing the dose. We aimed to evaluate the feasibility, safety, and utility of a BUP 32mg SL loading dose induction strategy in the ED by 1) estimating the proportion of participants who complete induction without clinically significant adverse events, and 2) assessing the magnitude and duration of effect on suppressing opioid withdrawal on days 1-3 after induction.

Methods: In this prospective, open-label, single-arm pilot from 11/2020 – 2/2023, we recruited adult ED patients from a public hospital and a private community hospital in New York City. Patients with moderate-severe OUD experiencing opioid withdrawal as measured by the Clinical Opioid Withdrawal Scale (COWS) were administered a total of buprenorphine/naloxone 32/8mg SL in divided doses given 30 minutes apart (8/2mg, 24/6mg). We excluded patients engaged in formal addiction treatment, medically/ psychiatrically unstable, or prisoners. Assessments of withdrawal, craving, and sedation were repeated every 30 minutes until 90 minutes after the final BUP dose on the index visit and at follow-up visits on days 1, 2, and 3. Toxicology tests were obtained at the index visit. Participants were not provided additional BUP until exhibiting opioid withdrawal based on COWS. We proposed a sample size of 35 for this pilot. The study was IRB-approved; participants provided written informed consent.

Results: We enrolled 14 patients (11 male; mean age=40.4; SD=4.1); 4 identified as white, 7 as Black/mixed race, 1 as Hispanic; 1 refused. Seven participants had toxicology positive for fentanyl (2 missing). All 14 participants had successful induction without clinically significant adverse events (Median COWS=1; IQR=1-4); one had initial improvement of withdrawal followed by re-emergence at 90 minutes. The number of participants with continued withdrawal suppression on days 1-3 was 9/14 (64.3%), 6/12 (50.0%), and 4/12 (33.3%), respectively. Participants with fentanyl use were considerably more likely to experience earlier opioid withdrawal with odds ratios of 14.1 (95% CI=0.57-352) and 33 (95% CI=1.1–1023.6) on days 1 and 2, respectively. Recruitment was halted for lack of utility after this analysis in the context of the high prevalence of fentanyl in the illicit drug supply.

Conclusion: Induction with BUP 32mg SL does not reliably prolong opioid withdrawal suppression to or beyond 24 hours amongst patients using fentanyl. Further study of appropriate BUP dose and dosing intervals is needed to prevent undertreatment in the fentanyl era.

No, authors do not have interests to disclose

EMF 90 High Rates of Asymptomatic Sexually Transmitted Infections Detected Through Confidential Self-Testing in the Emergency Department

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Study Objectives: Rising rates of sexually transmitted infections (STIs) remain a significant public health concern, particularly among vulnerable populations in urban areas who rely heavily on emergency department (ED) services and may have limited access to outpatient testing. A large, urban ED in Chicago implemented no-cost, confidential self-screening for gonorrhea, chlamydia, and trichomonas available to patients without STI symptoms through testing stations placed in all common bathrooms inside the ED and in the ED waiting room. This study reviewed

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retrospective data to evaluate the impact of the intervention on STI diagnosis and care among asymptomatic persons in the ED.

Methods: Anyone visiting the ED, whether registered as a patient or not, was eligible to participate in the self-testing program. Signage on the testing stations alerted patients with STI symptoms to speak to their care team rather than using self-testing. Result notification and linkage to care were performed by a team from the hospital's STI clinic. Treatment for individuals testing positive was offered in the STI clinic and included education about HIV prevention and initiation of HIV pre- exposure prophylaxis (PrEP) if desired. Data were reviewed for participants in the self-testing program for the six months following deployment of the testing stations (September 25, 2023 - March 25, 2024). Demographics, test results, and data related to linkage to treatment and HIV prevention services were collected. Descriptive statistics were used to evaluate demographics and clinical outcomes.

Results: During the study period, 140 individuals participated in the program, including 103 (73.6%) ED patients and 37 (26.4%) ED visitors. Of these, 83 (59.3%) were female, with a mean age of 30 years (range 18-72). A total of 23 (16.4%) individuals tested positive for an STI, including 12 with trichomonas, 8 with chlamydia, 2 with gonorrhea and chlamydia, and 1 with gonorrhea and trichomonas. All but one of these individuals were successfully contacted for treatment. Two patients who tested positive for an STI initiated HIV PrEP at follow-up in the STI clinic.

Conclusion: Confidential self-testing for STIs in the ED is an effective intervention that reaches both ED patients and visitors and leads to high rates of STI diagnosis. Working with hospital partners to ensure outpatient follow up, such a program can successfully lead to both STI treatment and HIV prevention engagement. A similar strategy could be implemented to increase access to screening and treatment for individuals in areas with high STI rates and limited access to care outside the ED.

No, authors do not have interests to disclose

EMF 91

Interventions to Reduce Emergency Department Admissions for High-Variation Conditions Under an Alternative Payment Model

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Study Objectives: In this mixed methods study, we evaluate a program aimed at reducing emergency department (ED) admissions using clinical protocols, education, and feedback. Interventions were supported by an upside-only shared savings alternative payment model (APM) between a national emergency medicine group and an insurer.

Methods: We analyzed visit data from 108 EDs continuously staffed by a national ED group across 18 states from August 1, 2020, to December 31, 2022. The feedback program launched in August 2021 at 16 EDs in a Mountain-region state and 22 in a Southwestern state. Conditions with high variation in ED admission rate were included in the APM. A difference-in-difference (DiD) analysis compared temporal changes in APM-participating EDs against control EDs in states not involved in the APM, specifically comparing clinical protocols, education and feedback to only protocols and education only, but no feedback. To explore potential broader effect of the APM interventions, we constructed a model using pre-intervention physician admission rate relative to facility average as a measure of propensity to admit a patient with chest pain at any facility in the data. To explore barriers and facilitators of the APM and its interventions, semi-structured interviews were conducted with emergency physicians and local leaders. Participants were offered a $100 gift card. Interviews were semi-structured and conducted via video conference for approximately 1 hour. Interviews were recorded, transcribed, and then analyzed for themes by two coders.

Results: The study included 906,355 ED visits, with chest pain being the most common diagnosis (40.7%). After program implementation, admission rates fell in both State A and State B which had clinical protocols, education, feedback, as well as in control EDs which received clinical protocols and education. The DiD analysis found no significant overall differential improvement in EDs receiving the feedback intervention on overall ED admission rates. However, admissions decreased more among high-admitting physicians in State A compared to similar physicians in control EDs. There was a significant decrease in admission rates for patients with chest pain among baseline high-admitting physicians in State A (average treatment effect of the treated -0.144 95% CI [-0.219 to -0.070]) (Figure 1). Using this effect on presentations for chest pain among baseline high-admitting physicians, we estimated the impact of deploying the APM at all of the control states. Among 108,117 visits for chest pain, this effect of the APM would result in 7,723 fewer admissions or an average reduction of about 7 fewer admissions per 100 chest pain visits. Common themes discussed by physicians include helpfulness of clinical decision tools to decrease medical legal risk, unnecessary testing, and safely discharge more patients, especially chest pain patients. Barriers identified by physicians included patient social determinants of health and also difficulty in accessing and applying clinical protocols in real time.

Conclusion: Admission rates fell in states that received clinical protocols and education but did not fall more in those also receiving feedback. There was a differential effect on outlier physicians, in particular those who received feedback about chest pain admissions, which was a major focus of the feedback intervention and the most common diagnosis. Physicians identified clinical tools as helpful resources and were motivated to use them to protect from medical legal risk. Social determinants of health were identified as a barrier to decreasing medically unnecessary admissions.

Yes, authors have interests to disclose

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Honoraria

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EMF 92

Improving Procedural Safety, Efficacy, and Patient Outcomes for Ultrasound Guided Nerve Blocks in the Emergency Department via Objective Competency Measures

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Study Objectives: Ultrasound-guided nerve blocks (UGNBs) relieve pain by delivering local anesthetic to peripheral nerves thereby blocking pain signals distal to the injection. In emergency department (ED)-settings, UGNBs decrease opioid use, reduce hospital length-of-stay, and increase patient satisfaction compared to traditional analgesia. Currently, there is no standardization in ED-based UGNB training, education, credentialing, or procedural quality assurance nation-wide. ED-based procedural competency is typically assessed via subjective, time-consuming, and non-validated methods such as direct observation and structured clinical examinations (OSCE). This study aims to establish objective measures of hand-and head-motion analysis to define procedural competency for UGNB.

Methods: Novice (emergency medicine providers with no prior advanced training in UGNBs) users performed UGNB in a simulation-based setting. The UGNBs selected are commonly indicated in ED practice and included the transgluteal sciatic nerve block, the interscalene nerve block and the fascia illiaca nerve block. Participants were fitted with a head-motion tracking headband (MUSE 2) and the session was recorded using computer-based analysis for hand-motion tracking. Expert-level UGNB proceduralists completed the same simulation-based training scenario. Performance was observed and graded by two independent UGNB procedural experts as the gold-standard competency measure via standard practice by OSCE scores. Motion metrics and OSCE scores were compared between novice and expert users.

Results: In total, 11 novices and 7 experts were recruited. 55% of novices completed a POCUS clinical rotation as residents, with the remaining 45% having completed a POCUS rotation as medical students. The average number (+/- SD) of nerve blocks performed by novices prior to data collection was 3.45 +/- 6.18 and ranking of confidence levels on the Likert Scale averaged at a score of 3.27 +/- 2.79. 71% of the experts recruited were Fellowship trained, with 2 of the experts being senior residents going into a clinical ultrasound fellowship. Experts had an average of 80.14 +/- 78.01 nerve blocks performed

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prior to data collection, with an average score of 8.71 +/- 1.03 for confidence level on the Likert scale. OSCE scores were totaled with a maximum score of 30 for all 3 nerve blocks. Scoring for each nerve block was from 1-10; 1 = unable to correctly reach the target, 5 = reached target with difficulty and with incomplete needle visualization, 10 = successful nerve block technique with good needle visualization. Novice participants earned an average overall OSCE score of 15.6 (+/- 7.9), with expert participants scoring 28.5 (+/- 2.44, $p < 0.001$), demonstrating a statistically significant difference between groups. Mann-Whitney U test revealed significant differences between novice and expert groups in all X, Y and Z of head and hand motion positions.

Conclusion: Objective measures of head and hand motion demonstrated significant differences between novice and expert POCUS users. This correlated with expected differences in OSCE scores, which are the current standard-of-care in measuring procedural competency. Our data suggests that computer-based metrics may be reliable measures of procedural competency. This pilot study suggests that objective measures of procedural competency can be used to standardize training programs, quality review, and for procedural credentialing protocols in medical education in the future.

No, authors do not have interests to disclose

EMF 93 The Association of Emergency Medical Services Agency- and Clinician-Level Factors With Adherence to Evidence-Based Guidelines for the Prehospital Management of Traumatic Brain Injury

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Study Objectives: Following evidence-based guidelines (EBGs) for the field management of patients with traumatic brain injury (TBI) has significant outcome benefits. However, the extent to which emergency medical services (EMS) clinicians adhere to TBI EBGs remains unclear. We aimed to identify variation in care for patients with severe TBI (sTBI) at the EMS clinician and agency levels using Brain Trauma Foundation (BTF) guidelines for the prehospital management of TBI.

Methods: In this cross-sectional analysis of 911 activation data from the 2019 ESO Data Collaborative, adult patients with TBI were identified by EMS primary or secondary impression, associated symptoms, or protocol used. Patients with traumatic cardiac arrest or environmental cause of injury were excluded. sTBI was defined as lowest documented Glasgow Coma Score (GCS) <9 or in whom airway management was performed. Variation in care was evaluated at the EMS clinician- and agency-levels for outcomes based on BTF guidelines (Table). Descriptive statistics summarized the unadjusted proportion of activations with guideline adherence. Odds of adherence to each guideline were calculated using multivariable mixed effects logistic regression models with random intercepts for clinician and agency and adjusting for patient characteristics, clinical severity, and clinician and agency characteristics. Variation due to clustering at the clinician and agencies level was quantified using intraclass correlation coefficients (ICC) and median odds ratios (MOR).

Results: Out of 216,784 EMS patients with TBI, we included 7,567 patients with sTBI in the analyses. Included encounters encompassed 16,856 EMS clinicians across 1,091 EMS agencies. Overall, 33% of sTBI patients had a documented oxygen saturation (SpO2) <90%, 14% had a systolic blood pressure (SBP) <90 mmHg, and 8% had both hypoxia and hypotension at some point during the EMS encounter. The mean agency-level rate of sTBI having a GCS documented twice was 81%. For sTBI patients with a documented SpO2 <90%, 80% received any supplemental oxygen. Meanwhile, 66% of intubated patients had a documented SpO2 >90%. For sTBI patients with SBP <90 mmHg, 66% had intravenous fluids administered. For sTBI patients with a measured end-tidal carbon dioxide (EtCO2), 73% had an EtCO2 of <35 mmHg. For intubated sTBI patients, 92% had any documented EtCO2 while 57% had a documented EtCO2 <30 mmHg. For sTBI patients whose destination was known, 37% were transported to a Level I or II trauma center. When adjusting for clinician and agency level factors, the MOR at the agency level for transport to a Level I or II trauma center was 37.6, while the ICC for transporting agency was 0.78 (95%CI 0.73-0.82). MOR at the agency level for oxygen administration if documented SpO2 <90% was 58.97, and 37.64 for IVF administration for SBP <90 mmHg.

Conclusion: For patients with sTBI transported by EMS, overall adherence to EBGs for TBI were low. Despite evidence demonstrating the detrimental effects for patients with TBI of even brief periods of hypoxia or hypotension, one third of patients with SBP <90 mmHg had no intravenous fluids administered and one-in-five patients with SpO2 <90% did not have documented supplemental oxygen administered. Further, despite poor outcomes associated with hyperventilation in TBI, almost half of intubated sTBI patients had a documented EtCO2 <30. This analysis indicates the main driver of variation occurs at the agency level, suggesting that improvement in agency-specific protocols and training may improve guideline adherence. Further studies are needed to determine the effect of such agency-level interventions on patient outcomes.

Table. BTF guideline measure and outcomes.

Measure	Operationalized outcome
GCS should be used repeatedly to identify improvement or deterioration over time	GCS documented at least twice
Hypoxia should be corrected immediately	Documentation of supplemental oxygen if SpO2<90%
Severe TBI should be transported directly to a facility with immediately available CT scanning, neurosurgical care	Transport to Trauma Center (Level I or II) if sTBI criteria met
Hypotensive patients should be treated with isotonic fluids	IV fluid administered if SBP<90 mmHg
Endotracheal intubation is not recommended for breathing patients with SpO2>90%	Documented SpO2<90% and pre-intubation RR<8 breaths per minute if intubated
After intubation, ETCO2 should be used to confirm placement	ETCO2 documented if intubated
Hyperventilation should be avoided	ETCO2 not <35 if intubated ETCO2 not <30 if intubated if suspected herniation

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94 Effect of Emergency Department Prompt on Improving Provider Documentation of Repeat Vital Signs in Children Presenting With Fever and Tachycardia

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Study Objective: The presence of abnormal vital signs can serve as an early warning to identify patients at risk for sepsis. Most if not all pediatric screening tools used to assess such risk include evaluation of vital sign profile; specifically incorporating the variables of body temperature and heart rate. Febrile patients presenting with tachycardia require close monitoring and serial vital sign measurements to ensure trending toward heart rate (HR) normalization prior to discharge. After identifying substandard documentation of this metric in our emergency department, we instituted a quality initiative to improve provider repeat HR measurement via electronic health record (EHR) issuance of a red-banner prompt [warning] prior to disposition.

Methods: Pre-prompt initiative, we surveyed 102 consecutive children presenting to the Pediatric Emergency Department (ED) with triage documented fever and tachycardia. All received evaluation by a pediatric emergency medicine attending physician; all were ultimately discharged from the ED. A system initiative was then instituted by which the EHR issued a red-banner prompt to providers for such children, prior to disposition; declaring that "the patient presented with fever/tachycardia", and to "consider repeat VS measurement prior to disposition". We then prospectively evaluated 301 consecutive children with ED triage documented fever and tachycardia who were ultimately discharged. Pre- and post-prompt initiative groups were compared to determine whether there was documentation of 1) repeat HR measurement and 2) repeat HR measurement normalization prior to discharge.

Results: Comparing patients pre- vs post-prompt initiative, there were significantly improved rates of documenting repeat HR [62% vs 99.5%; $p < 0.001$] and repeat HR normalization [35% vs 98%; $p < 0.001$] prior to discharge, respectively.

Conclusion: Utilization of an EHR red-banner prompt is highly effective in enhancing provider documentation of repeat HR with resolution of tachycardia in ED febrile children.

Table. Repeat vital sign documentation in ED children presenting with fever/tachycardia

	Pre-prompt initiative [*N* = 102]	Post-prompt initiative [*N* = 301]	*p* -value
Repeat heart rate [HR] performed	63/102 [62%]	299/301 [99%]	<0.001
Documented repeat HR normalized at discharge	22/63 [35%]	292*/299 [98%]	<0.001

No, authors do not have interests to disclose

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95 Characteristics and Length of Stay in Children With Bronchiolitis With and Without Intravenous Hydration

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Study Objectives: Acute bronchiolitis is the leading cause of inpatient hospitalizations in infancy. There are no clear guidelines on which patients with bronchiolitis require intravenous (IV) hydration. Common features such as fever and tachypnea increase the risk of dehydration in these patients. This study evaluates whether IV fluid resuscitation impacts LOS for patients admitted with bronchiolitis. We also evaluated factors driving medical decision-making for IV resuscitation.

Methods: Data on patients admitted with bronchiolitis were obtained retrospectively from two pediatric facilities. Data were collected on patient demographics, hospital length of stay (LOS), and method of hydration during the period of October 1, 2019 to January 1, 2023. Secondary variables were collected to compare children who received and did not receive IV hydration. A priori simple size of 54 patients was calculated, but we sampled more records to power secondary analyses. A one-way ANCOVA was performed to determine if hospital LOS differed significantly between IV hydration versus non-IV hydration after adjustment for patient level of severity.

Results: One hundred ninety-five patients were included in the study with 121 not receiving IV hydration and 74 receiving IV hydration. Patients who were febrile were more likely to receive IV hydration than those who were afebrile ($p < .001$). Outside of the subjective finding of paleness, there were no significant differences in clinical findings of dehydration for those who did or did not receive IV fluids. Children who received IV fluids had a longer length of stay of one half day compared to those who did not receive IV fluids ($p = .001$).

Conclusion: Objective physical exam findings were not utilized to determine IV placement for children with bronchiolitis. After adjusting for severity, receiving intravenous fluids for hydration increased the hospital length of stay.

No, authors do not have interests to disclose

96 Pediatric Nasal Foreign Body Not Visible on Simple Exam: Incidence and Patient Characteristics

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Study Objectives: Concern for nasal foreign body (FB) is a common presentation to the pediatric emergency department. Often a FB is readily visible, either by direct visualization or via otoscope. However, when these simple techniques do not reveal any FB, clinicians must consider whether to pursue additional measures such as secondary visualization techniques, blind removal attempt, and/or specialist involvement. Our objective was to determine the incidence of, and patient characteristics associated with, the presence of a pediatric nasal FB when one is reported but none is visualized on simple exam.

Methods: This was a retrospective review of children presenting to a tertiary pediatric emergency department in the midwestern United States. The charts of all patients presenting to the emergency department with a chief concern of nasal FB in the last 10 years were reviewed. Data were recorded in REDCap (Vanderbilt University, 2024) and analyzed in Microsoft Excel. Descriptive statistics and chi-square tests were performed. The study was exempted by our institutional review board.

Results: A total of 656 charts were identified. 41 charts were excluded (left without being seen, insufficient documentation, or incorrect chief concern). 425 patients had a FB visible on simple exam. This left 190 included cases in our cohort of interest (ie pediatric patients presenting to the emergency department with a chief concern of nasal foreign body but with none visible on simple exam). Of these, 33 (17%) were ultimately found to have a FB visualized via additional measures (eg, application of topical vasoconstrictors, use of a nasal speculum, nasopharyngoscopy, blind removal attempt, imaging, or specialist involvement). Table 1 compares clinical characteristics between those patients for whom no FB was ever visualized and those for whom a FB was eventually visualized via additional measures.

Conclusion: We found an incidence of 17% for pediatric nasal FB when one is reported but none is visualized on simple exam. Patient characteristics associated with FB only visualized via additional measures included ongoing symptoms, objective exam findings, and remote insertion time. There was no association with FB material, the presence of FB in multiple locations, or symptoms which had resolved prior to arrival.

Table. Clinical characteristics (all included patients with no FB visible on simple exam: never visualized vs. eventually visualized via additional measures). P-values are reported for chi-square tests comparing the two groups ($p<0.05$).

		Never visualized		Eventually vizualized via additional measures		P-value
n		157		33		
FB material	Degradable	71	45.2%	9	27.3%	0.151
	Inert	71	45.2%	19	57.6%	
	Unknown	15	9.6%	5	15.2%	
Insertion time	Today	120	76.4%	18	54.5%	**0.005**
	Yesterday	23	14.6%	4	12.1%	
	2-6 days ago	7	4.5%	6	18.2%	
	7+ days ago	3	1.9%	3	9.1%	
	Unknown	4	2.5%	2	6.1%	
Multiple locations		5	3.2%	3	9.1%	0.125
Associated symptoms at any time	Pain/discomfort	32	20.4%	11	33.3%	0.106
	Respiratory symptoms	16	10.2%	3	9.1%	0.848
	Discharge/rhinorrhea	36	22.9%	11	33.3%	0.208
	Dried blood/epistaxis	18	11.5%	8	24.2%	0.052
	Other	50	31.8%	13	39.4%	0.403
	ANY symptoms at any time	99	63.1%	25	75.8%	0.164
Associated symptoms ongoing now	Pain/discomfort	16	10.2%	8	24.2%	**0.027**
	Respiratory symptoms	11	7.0%	2	6.1%	0.845
	Discharge/rhinorrhea	28	17.8%	11	33.3%	**0.045**
	Dried blood/epistaxis	5	3.2%	5	15.2%	**0.005**
	Other	30	19.1%	11	33.3%	0.071
	ANY ongoing symptoms	61	38.9%	22	66.7%	**0.003**
Associated exam findings	Erythema	13	8.3%	1	3.0%	0.294
	Edema	25	15.9%	8	24.2%	0.252
	Excoriation	1	0.6%	1	3.0%	0.221
	Mucous/rhinorrhea/discharge	24	15.3%	16	48.5%	**<0.001**
	Dried blood/epistaxis	15	9.6%	10	30.3%	**0.005**
	Other	13	8.3%	3	9.1%	0.879
	ANY exam findings	62	39.5%	25	75.8%	**<0.001**

No, authors do not have interests to disclose

97 Trends Within Pediatric Traumas and Social Determinants of Health: A GIS Study

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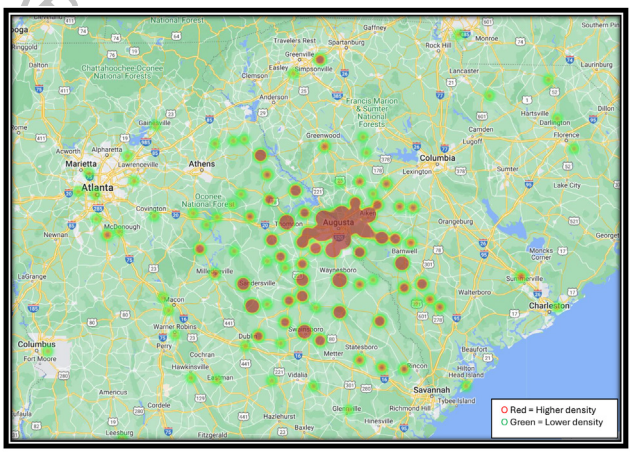
Study Objectives: Few studies exist identifying pediatric trauma patterns in relation to their social determinants of health. Previous literature describes poorer outcomes for pediatric patients residing in areas with a higher social vulnerability index (SVI). This study describes current pediatric trauma data within an urban pediatric trauma center and its trends of social factors in an attempt to determine ways to improve care for vulnerable children presenting to emergency departments. With the application of geospatial technology, hot-spots of pediatric traumas were developed in correlation of their social vulnerability index in order to better describe demographics, injury patterns, and potential for improved outcomes.

Methods: Thus far, 4 years of data has been reviewed through retrospective chart review involving a single, urban pediatric trauma center from 2019-2022. Inclusion data includes pediatric patients 18 years and younger presenting as a level 1, 2, or 3 trauma to the emergency department (ED). Data obtained via electronic medical record includes demographics, ED interventions, length of stay, disposition, and injury pattern. SVI were obtained via zip code from public census tracking and mapped through geomapping technology. Outcomes included hotspots of higher density patients compared to demographics, trauma level, interventions, outcomes, and injury patterns. Specific trends in SVI related to these outcomes were also further analyzed. Statistics were developed and analyzed using various methods through statistical software. This study is IRB approved by the institutional board.

Results: A total of 616 patients have met inclusion thus far. Approximately 95% of patients resided within a 200 mile radius of the ED. Multiple hotspots were identified via mapping software with clusters of children evaluated during this time period, with some clusters related to town population density, but not all, as evidenced in Figure 1 (1). Patients presenting as a level 1 or 2 trauma had higher SVI scores compared to level 3 traumas ($p<0.01$). Toddler-aged children ages 2-5 presented from higher SVI areas as compared to older children ($p=0.01$). Nearly all patients received medications regardless of trauma level or SVI. Children from higher SVI required more procedures overall ($p<0.01$). As far as mechanism, the most common diagnoses overall were fall (33%, N204/616), all-vehicle accidents (31%, N193/616), and non-accidental traumas (13%, N82/616). Children presenting as non-accidental traumas and motor vehicle accidents resided in higher SVI areas, with every patient presenting as a motor vehicle vs. pedestrian collision residing in moderate and higher SVI areas ($p<0.01$). Children from the lowest SVI areas most commonly presented with falls (35%, N30/86). There did not appear to be statistical significance pertaining to SVI with blunt or penetrating trauma, specifically if the trauma was a level 1. Children with higher SVI were more likely to be admitted to the ICU or die from their traumas ($p=0.005$).

Conclusion: This is one of the first studies of its kind to attempt to better describe pediatric traumas overall presenting to the ED and its correlation with SVI with the addition of geospatial technology. Higher SVI relates to poorer health outcomes but previously it was poorly described for pediatric traumas. Within this study, pediatric

patients from higher SVI areas required more procedures and were more likely to die or be admitted to the ICU due to their injuries. Specific injury types, such as NAT and MVCs were related to higher SVI, allowing room for community efforts to further educate patients on prevention and safety. Through geospatial technology, clusters were identified related to location and trauma patterns, identifying possible opportunities for interventions. Potential further studies include expanding the area of inclusion to expand the study, and further looking into specific injury types and/or detailed hotspots to provide community-wide interventions and hospital protocols to better care for vulnerable patients.



(1) Figure 1. *Pediatric Trauma Clusters*. This map shows an overview of all pediatric traumas evaluated in the study thus far within a 200 mile radius from the ED. Higher density of patients are reflected by darkening and widening of the circles. These darkened circles are referred to as clusters.

No, authors do not have interests to disclose

98 Three Pilot Randomized Controlled Trials Evaluating a Persuasive Health Communication Intervention for Adult Emergency Department Patients Declining HIV/HCV Testing

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Background: Testing for HIV and hepatitis C in emergency departments (EDs), whether for diagnosis or screening, facilitates treatment and linkage to care of those infected with these viruses. However, ED patients often decline testing, and there is a lack of evidence-based interventions to overcome patient refusal. We created a persuasive health communication intervention (PHCI) designed to overcome ED patient reluctance to accept HIV/HCV testing. In three pilot randomized controlled trials (RCTs), we evaluated the performance of a PHCI when delivered by: (1) video vs. control condition video; (2) ED HIV/HCV counselor vs. control condition video; and (3) video vs. ED HIV/HCV counselor.

Methods: We developed a theoretically-guided behavioral intervention that contained six successive components (information, education, gain, loss, common concerns, and call to action). These components collectively were intended to persuade an adult ED patient who had initially declined HIV/HCV screening to instead be tested for these infections. The PHCI was designed to be delivered in person or by video in English or Spanish. The PHCI video depicts an actor portraying a female physician delivering the PHCI in person to a male actor portraying an ED patient who had declined HIV/HCV screening. By the end of the video, the patient agrees to be tested for HIV/HCV. The control condition video was adapted from HIV and HCV testing patient brochures from the Centers for Disease Control and Prevention. This video featured an individual talking directly to viewers while basic graphics emphasizing the main points from the brochures were displayed simultaneously. English- or Spanish-speaking adult ED patients (18 to 64 years old) from two urban medical centers who declined opt-out HIV/HCV screening were enrolled into one of three pilot RCTs. Participants were randomly assigned (1:1 allocation) in each pilot RCT as follows: (pilot RCT 1) PHCI video (n=28) vs. control condition video (n=27); (pilot RCT 2) PHCI delivered in-person by an ED HIV/HCV counselor (n=30) vs. control condition video (n=30); and (pilot RCT 3) PHCI delivered in-person by an ED HIV/HCV counselor (n=29) vs. the PHCI video (n=29). The primary outcome for each RCT was acceptance of HIV/HCV testing post-intervention.

Results: Participant acceptance of HIV, HCV or both tests post-intervention was: (1) PHCI video (24.8%) vs. control condition video (12.5%), $p<0.07$; (2) PHCI delivered in- person by HIV/HCV counselor (10.0%) vs. control condition video (26.7%), $p<0.09$; and (3) PHCI delivered in-person by HIV/HCV counselor (48.3%) vs. the PHCI video (34.5%), $p<0.29$.

Conclusions: The results from these pilot RCTs indicate that ED patients who initially declined HIV/HCV testing can be persuaded to be screened for these infections. The PHCI is a promising intervention to encourage screening for these infections. Further fully powered research is needed to determine if the PHCI should be delivered in-person or by video, or if either delivery mode successfully convinces adult ED patients to be tested for HIV/HCV.

No, authors do not have interests to disclose

100 Autologous Fat Transfer Procedure Complications in the Emergency Department: A Public Health Crisis

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Study Objectives: Gluteal Autologous Fat Transfer (AFT) procedures, known to the public as "Brazilian Butt Lifts" (BBL), are an increasingly popular cosmetic surgery procedure. The reported number of cases per year in the US has increased dramatically in the last 20 years, particularly in the Miami area. Plastic surgery literature estimates that gluteal AFT procedures carry the highest mortality rate of any cosmetic surgery, but to our knowledge no comprehensive review of all gluteal AFT complications exists. This creates a dangerous knowledge gap for emergency medicine (EM) providers who may not be familiar with this procedure and must care for these patients in the post-operative period. Our study aims to share the experience of four public EDs in the Miami area which cared for patients experiencing gluteal AFT complications in order to provide emergency physicians with a better understanding of these patients and their specific pathology.

Methods: This was an IRB approved, cross-sectional, retrospective chart review of all cosmetic surgery complications that presented to the four public EDs in the Jackson Health System (JHS) in Miami, FL from October 2020 to May 2023. The electronic medical record was searched for patients with ICD-10 codes related to cosmetic surgery complications. These charts were manually reviewed to determine if a gluteal AFT procedure prompted the ED visit. Patients were excluded if they did not undergo gluteal AFT or if they were pregnant, under the age of 18, incarcerated, or cognitively impaired. Patient charts were then reviewed and data collected regarding patient demographics, final diagnosis, interventions, admission rates, length of stay, level of care, and mortality.

Results: Our review revealed 234 patient charts with the designated ICD-10 codes. Of these, 77 patients met exclusion criteria, leaving 157 cases for review. These patients were 100% female and average age of 33. The medical record identified 52.9% of these patients as white, 45.2% Black or African American, and 1.9% as other. 78.3% of patients were from out of state, 0.6% were international. Patients presented an average of 1.7 days after their procedure. Our analysis revealed 54.8% of patients presenting to the ED require admission to the hospital, with 7.6% of all presentations requiring ICU level of care. Within the study population, 40.1% of patients presenting to the ED required blood transfusion at some point during their ED or hospital stay. Of patients requiring blood transfusion, the average transfusion requirement was 2.0 units of packed red blood cells. The most common diagnoses were anemia/bleeding (51.6% of patients), followed by pain (41.4%), and hypovolemia/dehydration (20.4%). 22.9% had a cardiac complication including cardiac arrest (3 patients), myocardial infarction (1 patient), and supraventricular tachycardia (1 patient). One patient suffered a stroke (0.6%). One patient died (0.6%).

Conclusion: Gluteal Autologous Fat Transplant (AFT) is an increasingly common and potentially dangerous cosmetic procedure. While recent legislation has been passed in an effort to improve safety and protect patients, it remains to be seen how effective this will be. Until then, it is crucial that EDs prepare themselves to manage these patients and their potential complications.

No, authors do not have interests to disclose

101 Evaluation of Missed Opportunities Prior to HIV Diagnosis in a Large Southeastern Level 1 Trauma Center

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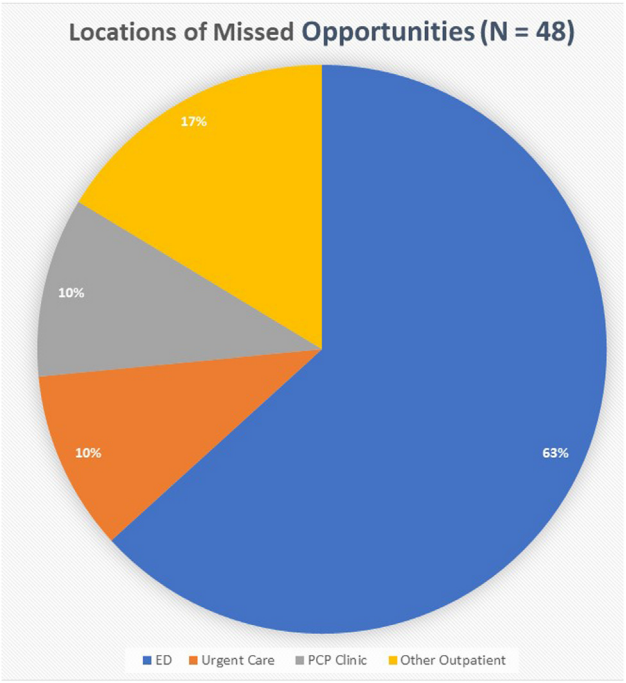
Study Objectives: South Carolina is among the top five states in the country for incidence of sexually transmitted infections (STIs), and the Southern region of the United States accounts for 51% of all new HIV diagnoses despite only accounting for 38% of the population. An overall lack of screening services has contributed to this growing epidemic, prompting several healthcare systems in South Carolina to initiate emergency department (ED)-based opt-out screening programs. In January 2022, Prisma Health Richland initiated a generalized opt-out screening program (iLink) for HIV based on the recommendations of the Centers for Disease Control (CDC) and the United States Preventive Services Task Force (USPSTS). The purpose of this study is to identify missed opportunities for HIV diagnosis, risk factors for HIV, and demographic trends among patients who received a new HIV diagnosis in the ED.

Methods: A retrospective chart review was performed to identify patients who received a new HIV diagnosis in the three Midlands EDs between January 2022 and December 2023. Each patient's chart was reviewed, and the following information was extracted: basic demographics, risk factors for HIV, and missed opportunities for HIV screening. Missed opportunities were defined as any face-to-face encounter with a healthcare provider 365 days before HIV diagnosis within or outside the Prisma Health system if recorded within Epic's Care Everywhere®.

Results: 61 new HIV diagnoses were made through ED opt-out testing, giving a 0.47% positivity rate. Of the 61 chart-reviewed patients, 48 (79%) had a missed opportunity. The emergency department accounted for 31 (65%) missed opportunities, while 5 patients (10%) had a missed opportunity at an Urgent Care. An additional 5 patients (10%) were noted to have a missed opportunity at a PCP clinic. Males accounted for 70% of new diagnoses (n=61) and 71% of those with missed opportunities (n=48) despite being 49% of the South Carolina population. African Americans were also noted to have high rates of HIV infections, accounting for 89% of all new HIV infections (n=61) and 91% of all those with a missed opportunity (n=48). Non-Black study participants made up just 7% of all new HIV diagnoses (n=61) and 4% of all missed opportunities (n=48). Previous diagnosis of STI was the most significant risk factor identified for all new HIV diagnoses and those with a missed opportunity. Of the 61 new patients found with HIV, 30 (49%) of them had a recorded STI a year before their diagnosis or in the 30 days after. In those patients with missed opportunities (n=48), 21 (44%) had an STI risk factor.

Conclusions: Missed opportunities in the diagnosis of HIV occurred in 78% of all new HIV diagnoses during the study period. Most missed opportunities were recorded in the ED (65%), while 10% were recorded at Urgent Care locations and PCP offices. Findings show that screening based on risk factors alone is ineffective, especially if those risk factors are stigmatized even in a non-emergent healthcare environment and with providers with some level of patient care continuity. Increased screening in unconventional venues such as Urgent Cares and PCP offices should be considered regardless of a patient's risk factors. Screening for HIV should be considered best practice for anyone who tests positive for an STI, as 49% of new HIV patients had an STI diagnosis before or within a month after their HIV diagnosis.



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102 Leveraging Big Data in ACEP's Emergency Medicine Data Institute Registry to Measure Syphilis and Sexually Transmitted Infection Co-Testing Rates Among Emergency Department Patients With Pregnancy Testing

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Study Objectives: The prevalence of congenital syphilis (CS) is increasing in the United States. Infants born with CS can suffer from a range of serious health issues including low birth weight, prematurity, deformed bones, severe anemia, enlarged liver or spleen, jaundice, nervous system disorders, meningitis, miscarriage and still birth. The resurgence of CS reflects a missed opportunity for prevention due to lack of early testing in pregnant patients. CDC recommends syphilis testing at the time of positive pregnancy, especially for patients with poor follow-up. Patients seeking pregnancy-related care in the emergency department (ED) may represent a population at risk of poor follow-up. Our primary aim was to describe the prevalence of syphilis, HIV and Gonorrhea/ Chlamydia testing in pregnant ED females, including the extent of co-testing, defined as patients receiving both a pregnancy and sexually transmitted infection (STI) test.

Methods: ACEP's Emergency Medicine Data Institute Registry, the Clinical Emergency Data Registry, is an encounter-level relational database which collects ED electronic health record and billing data from hospitals and physician groups. Data feeds from each participating ED contain up to 800 distinct data elements (eg, encounter datetimes, date of birth, gender, diagnosis, procedure, order, laboratory result). This data is standardized and normalized into a clinical data repository. We examined encounter-level laboratory results data within the ACEP's Registry for calendar year 2023 to evaluate ED care by querying syphilis, HIV and other STI testing for patients tested for pregnancy

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and with a pregnancy diagnosis. We generated value sets for pregnancy and syphilis tests and diagnoses using the discrete Logical Observation Identifiers, Names and Codes (LONIC) and ICD-10-CM standards, respectively. We included all ED visits by female patients ages 12-55 years with routine discharge who were tested for pregnancy. We classified a presumed positive pregnancy test as a pregnancy test result and a discharge diagnosis of pregnancy.

Results: In 2023, there were 16,329,522 total emergency department encounters and of those 1,409,356 pregnancy tests ordered. We identified 152,933 encounters with a pregnancy test and a pregnancy related diagnosis out of which 4,308 encounters were co-tested for syphilis, 3,174 for HIV, 20,169 for Gonorrhea/Chlamydia. The co-testing rate of pregnancy test and syphilis tests ordered was calculated to be 0.31%., co-testing for HIV was 0.23% and co-testing for Gonorrhea/Chlamydia was 1.43%. The co-testing rates with a presumed positive pregnancy test were 2.8% for syphilis, 2.1% for HIV, and 13.2% for Gonorrhea/Chlamydia.

Conclusion: Using ACEP's registry, only 2.8% of women tested for pregnancy were found to also be tested for syphilis. Low rates of STI testing among women seeking pregnancy-related care in the ED suggest an opportunity to improve quality and public health, particularly among patients with barriers to accessing care.

Table 1.

Category	Unique Encounters
All encounters	16,329,522
With Pregnancy test result	1,409,356
With Pregnancy test result and diagnosis (i.e., presumed positive pregnancy)	152,933
Plus Syphilis test	4,308
Plus HIV test	3,174
Plus Gonorrhea/Chlamydia test	20,169

No, authors do not have interests to disclose

103 Underserved Emergency Department Populations at Risk for Negative SARS-CoV-2 Vaccination Status and an Intervention to Improve Utilization

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Study Objectives: The health costs of the SARS-CoV-2 (COVID-19) pandemic were disproportionately borne by our most vulnerable populations, including individuals from racial and ethnic minorities, rural residents, the uninsured, those living in poverty, and those with preexisting health conditions. Many of these groups are overrepresented in the emergency department (ED) patient population. Further, many of these patients receive their only medical care in the ED, making it a critical resource for improving their care. Although SARS-CoV-2 vaccines significantly reduce rates of severe COVID-19 illness, hospitalization and death, less than two-thirds of eligible residents in many Southern US states received a single vaccine dose. With respect to factors influencing vaccine utilization, studies have demonstrated that patients may ignore public health messages, such as those promoting vaccination, if they perceive the topic as unpleasant or irrelevant. We hypothesized that an unvaccinated ED patient population in the Southern US would demonstrate an increased frequency of medically vulnerable populations, and that a gamified educational intervention would increase vaccine education and confidence in that environment. Our study objectives were to: Obtain demographic and health-related factors associated with a lack of SARS-CoV-2 vaccination in a Southern US ED patient population; Perform a pilot assessment to evaluate the effectiveness of a gamified intervention among ED waiting room participants to promote vaccine education and confidence.

Methods: For Objective 1, a retrospective cohort study was performed on 54,468 adult patients visiting six urban, suburban and rural EDs in the US South from August 1 to October 31, 2022. Demographic and health-related factors were extracted from electronic medical records to examine potential associations with vaccination status. A logistic regression analysis was performed to identify factors independently associated with an unvaccinated SARS-CoV-2 vaccination status. For Objective 2, a convenience sample of 147 patients and family members in a Southern US ED waiting room were recruited between May and June of 2023 to interact with a gamified intervention on a researcher-supplied mobile device. The intervention consisted of 18 true/false vaccine claims and players received immediate corrective feedback if they responded incorrectly and links to authoritative sources were provided. SARS-CoV-2 vaccine confidence and knowledge retention were measured pre/post intervention.

Results: Documented or self-reported SARS-CoV-2 vaccination was observed in 38.6% of patients. Within the unvaccinated population, there was an increased frequency of male (OR 1.10, 95% CI 1.05-1.14), multiracial (OR 1.41, 95% CI 1.11-1.79), uninsured (OR 2.66, 95% CI 2.47-2.87), Medicaid (OR 1.89, 95% CI 1.77-2.01), actively smoking patients (OR 1.95, 95% CI 1.84-2.06), or patients with a history of substance abuse (OR 1.13, 95% CI 1.06-1.21). Vaccine confidence after gamified, educational intervention use was significantly greater than pre-intervention confidence, $t(66) = 4.25$, $p < 0.001$, $d = .52$, representing a medium Cohen's effect size. A change in means analysis suggested an 18% improvement in vaccine confidence after game use. When asked later during game use, 76% of participants correctly answered a question initially answered incorrectly, $t(75) = 5.36$, $p < .001$, $d = .615$, demonstrating that corrective feedback was attended to and retained for at least the duration of the activity.

Conclusion: These data suggest that Southern US ED patients who have not received a SARS-CoV-2 vaccination are more likely to be male, multiracial, uninsured, on Medicaid, actively smoking or have a history of substance abuse. These findings may be used to develop patient-centered educational interventions for these populations to improve vaccine utilization against COVID-19 and, potentially, other infections. Further, gamified health promotion may be effectively deployed in medical waiting rooms to capitalize on patient attention and motivation as a just-in-time intervention for subsequent treatment opportunities, such as vaccination.

No, authors do not have interests to disclose

104 Implementation of an Emergency Department Quality Improvement Program to Improve Care for Emergency Department Patients With Opioid Use Disorder at Four Southwest Michigan Hospitals

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Study Objective: Opioid use disorder (OUD) causes significant, and still increasing, morbidity and mortality in the United States. Opioid overdose remains one of the leading causes of death particularly among younger demographics3. 2.5 million Americans have OUD, yet only 1 in 5 (22 %) receive medications to treat it. There are three FDA approved medications available for treatment of OUD: methadone, buprenorphine, naltrexone. Patients who receive medication for OUD (MOUD) experience decreased mortality, overdose rates and emergency department (ED) visits compared to those who do not. Buprenorphine can safely be administered in the ED for patients in acute opioid withdrawal or prescribed to patients not in withdrawal to start at home.

Methods: In December 2022, the Bronson Health Foundation received a grant from the Michigan Opioid Partnership to develop an ED MOUD Program across Bronson Health System's four EDs. The goal of the program is to (1) identify ED patients with OUD during their ED visit, (2) begin MOUD during an ED encounter and (3) establish linkages with community prescribers for close follow up within seven days. A monthly EPIC report is generated to find opioid related ED visits, using 127 opioid ICD-10 codes provided by the granting foundation. These monthly metrics were generated for the 9-month intervention period: January 2023 through September 2023. Metrics included number of patients with an OUD related diagnosis offered treatment with buprenorphine, number of patients receiving a consult with medical social work/ peer recovery coach, and number of patients discharged with a prescription for Naloxone or a Naloxone kit. Inclusion criteria are patients aged 18 and older cared for in a Bronson ED with an OUD related diagnostic code upon discharge from ED or admission to hospital.

Results: ED visits with an opioid related diagnosis stayed constant during the intervention period, between 25 to 35 visits monthly system wide. Social work consults increased from an average of 50% between January-March to 66% between May-June. Recovery Coach consults increased from 4% in January to a high of 68% in September. Buprenorphine prescriptions increased from 0% to an average of 64% between the months of June-September. Ninety-five patients were started on buprenorphine during the grant period. Naloxone Prescriptions also increased from 12% in January to a high of 64% in September. 63 naloxone kits were distributed between May 30th and September 30th. There were zero episodes of precipitated withdrawal and zero episodes of respiratory depression requiring oxygen in the patients started on buprenorphine in the ED.

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Conclusion: A quality improvement initiative in March 2023 offered ED providers education resources; order sets with recommended buprenorphine dosing for both ED dosing and discharge prescriptions; and discharge referrals to community partners for follow-up buprenorphine treatment within seven days. Over the nine months of our quality improvement initiative, we have seen an increase in quality of care for patients with OUD related ED diagnoses including increasing prescriptions for buprenorphine, social work consults, peer recovery coach consults, and increasing Naloxone prescriptions and kit distribution. Despite these increases consistent follow-up with Emergency Physicians, APPs, and Nurses is needed for continuation of these practices. Next steps include: a registry of those identified with OUD during ED visits for follow-up for this high-risk population; ED and community naloxone distribution; and identifying other ways we can better serve those struggling with OUD.

No, authors do not have interests to disclose

105 Comparing Imaging Rates for Work-Related and Non-Work-Related Injuries in the Emergency Department

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Background: Work-related injuries are prevalent and there is pressure to return patients to work. There may be greater use of diagnostic imaging among injured workers than in their matched counterparts. Over-investigation through imaging can often lead to unnecessary harm. This study aims to explore whether physicians overutilize imaging tests in the emergency department (ED). Here, we focus on data collected from EDs across Nova Scotia, Canada.

Study Objectives: The primary objective of the study is to compare diagnostic imaging rates in two cohorts, patients covered under the Workers Compensation Board (WCB) of Nova Scotia, and those who are covered by the public system of the Department of Health & Wellness (DOHW) to determine whether physicians utilize imaging tests differently across different "classifications" of patients.

Methods: This study is a retrospective, cohort analysis of all patient encounters over a ten-year period, spanning July 1, 2009, to June 30, 2019, inclusive. Data was collected for diagnostic imaging completed for work-related (WCB) and non-work related (DOHW) cohorts of patients over ten years. A total of 308,405 ED patient encounters for injuries from the Emergency Department Information System (EDIS) were included. As imaging for injuries increased with patients age due to increasing frailty and comorbidities, patients over 65 years were excluded to avoid skew in the data. Data analysis was conducted using MATLAB.

Results: First, imaging metrics for both cohorts in their entirety were considered. Imaging was performed in 56.13% of the WBC cohort, while 55.33% of the DOHW cohort had imaging. The data was then divided by CTAS, decade of life and year of the Emergency Department visit for further analysis. The overall imaging rates are higher in the DOHW group than the WCB group before taking into consideration an age limitation. Among patients aged 16-65 with Canadian Triage Acuity Scale level of 4 or 5, more imaging was ordered in both cohorts. Stratification of the data by imaging modality reveals that majority of imaging done in the ED is via X-ray. Noteworthy was the 22% increase in X-ray imaging in the WCB group for CTAS 4 which is the highest number of images per subclassification. Cost savings for this category alone could exceed $100M over 10y.

Conclusions: Campaigns such as Choosing Wisely Canada™ may be having impacts. There is a statistically significant decrease in overall rates of imaging over the study period across all CTAS scores and patient ages in both WCB and DOHW cohorts. This provides an indication that clinicians are willing and able to change their practices, however, the discrepancies in imaging rates between the WCB and DOHW cohorts demonstrate that there is still room for improvement to reduce unnecessary imaging within EDs for patients with moderate occupational injuries.

No, authors do not have interests to disclose

106 Emergency Physician Quality Improvement Metric Increases Utilization of Medication for Opioid Use Disorder

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Study Objectives: Buprenorphine significantly reduces mortality in patients with opioid use disorder (OUD). Despite evidence supporting its use for emergency department (ED) patients, physicians are reluctant to adopt medication for opioid use disorder (MOUD) prescribing as the standard of care. The lack of MOUD utilization training in the ED, standardized performance measurements, and outpatient referral procedures contribute to poor adoption. This study's objective was to determine if an incentivized buprenorphine utilization quality metric for emergency physicians, executive leadership support, and dedicated MOUD education improved the utilization of buprenorphine in the management of ED patients who received naloxone to reverse an opioid overdose. The goal of the quality metric was to administer or prescribe buprenorphine to 25% of naloxone-reversed opioid overdose ED patients.

Methods: A retrospective chart review was performed at 10 EDs from January to December 2022 (pre-implementation) and June to December 2023 (post-implementation). Patients were included if they received naloxone prior to arrival or in the ED and were excluded if naloxone was erroneously given for non-opioid related altered mental status or respiratory depression, they were inappropriately referred to peer recovery supports, or if they were unavailable or unable to engage with peer recovery support. Patients identified during nursing triage intake were automatically referred to hospital-employed peer recovery specialists, who staff all EDs 24 hours a day, seven days a week, to conduct substance use disorder peer support assessment. Post-implementation pharmacy data regarding buprenorphine administration and prescribing rates were compared with peer recovery support program records of naloxone-reversed opioid overdose patients to determine buprenorphine utilization during the ED encounter. A monthly ED-level report identifying the number of eligible patients, buprenorphine doses administered, and buprenorphine prescriptions given was shared with service line leadership and patient-level data was disseminated to ED medical directors who were encouraged to review cases with physician staff. The Emergency and Hospitalist Medicine service line System Director of Addiction Medicine, an emergency medicine and addiction medicine boarded physician, was present at monthly ED leadership meetings, provided dedicated educational sessions to attending physicians, residents, pharmacists, peer recovery teams, and nursing staff about MOUD utilization, and was available for bedside support.

Results: In 2022, before implementation of the quality metric, 1,051 ED patients who received naloxone to reverse an opioid overdose were treated, but only 11 patients (1.0%) were administered or prescribed buprenorphine. The quality metric included 771 patients. From June to December 2023, 35.1% of naloxone- reversed ED patients ($n = 271$) were administered or prescribed buprenorphine, and 1,434 ED patients were administered or prescribed buprenorphine regardless of naloxone status. Chart reviews enhanced quality improvement efforts and ensured the fidelity of the data.

Conclusion: Adoption of an MOUD-focused physician quality metric incentive, dedicated leadership support, concentrated MOUD education, and robust peer recovery services improved MOUD utilization in the ED. Since the inception of the quality metric, buprenorphine administrations and prescriptions increased for naloxone-reversed and non-naloxone-reversed OUD patients. Additional quality improvement efforts are necessary to identify patient and physician biases to continue improving patient care, expand the capacity for physicians to utilize MOUD in the ED, and ultimately ensure sustainability of MOUD treatment for OUD patients.

No, authors do not have interests to disclose

107 Frequency of Aspirin Re-Evaluation After a Bleeding-Related Emergency Department Visit: A Pilot Study

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Study Objectives: Bleeding, either caused or complicated by aspirin, should trigger re-evaluation of aspirin prescription with consideration for long-term discontinuation (ie, deprescription) among patients whose risks outweigh the benefits. To our knowledge, no study has ever examined the extent to which patients re-evaluate aspirin use and discuss the possibility of deprescribing after the manifestation of bleeding requiring emergency department (ED) care.

Methods: A pilot cohort study was conducted at a southeastern academic ED to determine if older adults re-evaluate the risks and benefits of aspirin use with their provider 14 days after an ED visit for bleeding. Patients were eligible for enrollment if they were ≥65 years old, presented to the ED with a bleeding event, and had long-term aspirin use (consume aspirin most days of the week for >3 months). We identified bleeding from the electronic health record using diagnostic codes implemented in the National Electronic Injury Surveillance System-Cooperative Adverse Drug Surveillance Project to detect drug-related hemorrhage. Long-term

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aspirin use was confirmed via a telephone interview at enrollment. After enrollment, participants were interviewed 14 and 30 days after the index ED encounter. Our primary outcome was if patients discussed the risks and benefits of continued aspirin use with a medical provider within 14 days of the ED encounter.

Results: Between May and August 2023, we screened 748 ED encounters for study eligibility, contacted 88 patients, and enrolled 24 participants. The study participants were female (12/24; 50%), White (20/24; 83%), and had an average age of 77.8 years. Only five of 24 participants (21%; 95% CI: 9-43%) reported receiving counsel on aspirin 14 days after an ED visit for bleeding. An additional three participants discussed aspirin use with their provider between 14 and 30 days after the index ED visit. At 30 days, 19 of 21 participants (90%; 95% CI: 67-98%) resumed aspirin use. One participant opted to self-discontinue, while another deprescribed aspirin in consultation with a prescriber.

Conclusion: Roughly 8 in 10 older adults who presented to the ED with bleeding did not receive counsel on the risks and benefits of resuming their aspirin use, either in the ED or outpatient setting. Opportunities exist to facilitate improved re-evaluation of aspirin after the manifestation of bleeding.

Yes, authors have interests to disclose

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108 Improving Emergency Department CT Turnaround Times in a Large, Urban, Academic Medical Center

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Study Objectives: Obtaining cross-sectional imaging often influences emergency department (ED) length of stay (LOS). Our project aimed to quantify CT turnaround times (CT TAT), identify factors that delay CT TAT, and implement interventions to accelerate cross-sectional imaging acquisition.

Methods: The authors focused efforts on a large, urban, quaternary academic center. CT TAT was measured from the time CT orders were placed to the time studies were marked as "exam begun" by CT technologists. Preliminary CT TAT data was collected via Siemens Healthineers Teamplay. A list of institutional stakeholders was compiled, and "voice of the customer" interviews were conducted. Current-state process mapping and root-cause analysis (RCA) was completed. A suite of interventions was designed and implemented. This included an order-set pairing Stat Creatinine (Cr) and urine hCG testing with CT studies, streamlining the urine hCG collection workflow, amending electronic medical record (EMR) orders to include options to bypass labs for emergent CT studies, engaging IT to optimize visibility of lab results for CT technologists, and educating staff about requisite labs policies and patient preparation. CT TAT was compared between the 6-month pre-intervention period and 6-month post-intervention period, by both scanner and study type. For analyzing differences in CT TAT based on requisite labs, representative studies were chosen among CT scans of the abdomen/pelvis (CTAP).

Results: Monthly averages for CT study volume, ED arrivals, boarding hours, and CT TAT were calculated from 6-month pre-intervention and 6-month post-intervention periods. CTs ordered in the ED increased 18.5% (2,498 to 2,960 studies). ED arrivals increased 5.1% (5,279 to 5,552 patients). Boarding hours increased 6.7% (18,130 to 19,340 hr). CT TAT for studies performed in the ground floor CT decreased 11.2% (107 to 95 min). CT TAT for studies performed in the second floor CT decreased by 7.5% (164 to 152 min). Representing scans requiring no labs, CT TAT for male patients undergoing non-contrast CTAP decreased by 8%. Representing scans requiring only Cr, CT TAT for male patients undergoing contrast enhanced CTAP decreased by 16%. Representing scans requiring only hCG, CT TAT for female patients ages 9-55 yr undergoing non-contrast CTAP decreased by 16%. Representing scans requiring both an hCG and Cr result, CT TAT for female patients ages 9-55 yr undergoing contrast enhanced CTAP decreased by 3%.

Conclusion: Despite increases in the number of CT scans, ED arrivals, and boarding hours, CT TAT improved after implementing process improvement initiatives focused on the ordering, collection, and processing of Cr and hCG tests. Consistent with published literature, this work demonstrates the value of a multidisciplinary approach, process mapping, and RCA. The challenges of ED boarding continue, prolonging CT TAT and likely resulting in an underestimation of the positive impact of these interventions.

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109 Association Between Naloxone and Patient Outcomes in Out-of-Hospital Cardiac Arrests in California

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Study Objectives: The incidence of opioid-associated out-of-hospital cardiac arrest (OA-OHCA) has grown from <1% of OHCA in 2000 to 7-14% of OHCA in recent years. It is unknown whether naloxone improves survival in these patients or in patients with undifferentiated OHCA. We evaluated the association between naloxone administration and clinical outcomes in a large, retrospective cohort of patients with EMS-treated OHCA.

Methods: We studied a cohort of patients with OHCA that were treated by EMS providers in three Northern California counties (Sacramento, San Francisco, Yolo) between 2015-2023. Data were obtained from the Sacramento City Fire Department, San Francisco County EMS Agency, and Yolo County EMS Agency. Standardized international Utstein definitions for reporting clinical variables and outcomes associated with cardiac arrest were used to ensure data uniformity. Cardiac arrests were identified as presumed drug-related when the arrest was caused by a known or presumed overdose of legal or illegal substances. Inclusion criteria were patient age greater than 18 years old and pre-hospital treatment for cardiac arrest. The primary exposure was EMS-administered naloxone during treatment of OHCA and the primary outcome of interest was patient survival to hospital discharge. Our secondary outcome of interest was sustained return of spontaneous circulation (ROSC). Data were analyzed using propensity-score models (inverse probability weighted regression adjustment and nearest neighbor propensity score matching) and a logistic regression model that included an interaction term for naloxone administration and presumed drug-related OHCA.

Results: Among 8,195 patients with OHCA treated by five EMS agencies from 2015-2023, 715 (8.7%) were believed by treating providers to have drug-related OHCA. Naloxone was administered to 1,165 (14.2%) patients and was associated with increased survival to hospital discharge using both nearest neighbor propensity matching (absolute risk difference [ARD] 5.0%, 95% CI 0.5-9.6) and inverse propensity weighted regression adjustment (ARD 3.9%, 95% CI 1.1-6.7). Naloxone was also associated with increased sustained ROSC using both nearest neighbor propensity matching (ARD 12.5%, 95% CI 5.6-19.4%) and inverse propensity weighted regression adjustment (ARD 11.2%, 95% CI 6.8-15.7%). The number needed to treat with naloxone was 9 for ROSC and 26 for survival to hospital discharge. In a regression model that assessed effect modification between naloxone and presumed drug-related OHCA, naloxone was associated with improved clinical outcomes in both the presumed drug-related OHCA and non-drug-related OHCA groups.

Conclusion: In this study of adult OHCA patients treated in three Northern California counties between 2015-2023, naloxone administration as part of EMS management of OHCA was associated with increased rates of sustained ROSC and increased survival to hospital discharge. These findings were consistent using two propensity score-based models and a logistic regression model, suggesting a strong association between naloxone and improved patient outcomes. These findings support further prospective evaluation of naloxone as part of cardiac arrest care.

No, authors do not have interests to disclose

110 Resuscitation Videography for Innovation in the Emergency Department (REVIVED): A Multi-Center Collaborative to Study Emergency Department Cardiac Arrests Using Video Review

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Background/Objectives: In the United States, more than 350,000 out-of-hospital cardiac arrests (OHCAs) occur annually with <23% survival to hospital admission and <10% survival to hospital discharge. The 2020 American Heart Association guidelines for Cardiopulmonary Resuscitation (CPR) list several recommendations for improving survival including high quality CPR, early defibrillation, and minimizing interruptions in chest compressions. Data registries allow for the analysis of metrics and track progress. Examples include the Cardiac Registry to Enhance Survival (CARES), the European Registry of Cardiac Arrest, and the Pan Asian Resuscitation Outcomes

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Study. However, they are limited as they rely on call centers, Emergency Medical Services, and review of hospital Electronic Medical Record (EMR) data – each with different data collection practices, time-recording devices, and biases. Video-review of emergency department cardiac arrests (EDCAs) offers a robust data collection tool which permits greater variety in variable selection and more accurate collection of time-based variables without recall bias. Here, we describe the establishment of the Resuscitation Videography for Innovation in Emergency Department (REVIVED) multi-national data registry to study EDCAs, and the corresponding data definition dictionary based on expert panel consensus.

Methods: Since May 2023, resuscitation experts engaged in cardiac arrest video review from seven institutions in Northern America met to establish REVIVED. All seven institutions had previously published their institution's video review program. First, variables from the Utstein Resuscitation Registry Template for OHCAs, CARES, and variables selected from each institution's cardiac arrest video review programs were consolidated. Between 2023-2024, the collaborative held monthly discussions with controlled feedback by designated moderators. After several iterations, a consensus was reached about variables to be collected with clear definitions and standardized response options to later facilitate multicenter data pooling. All time-based variables will be collected or extrapolated from the video recording clocks to standardize the calculation of key cardiac arrest time intervals.

Results: A total of 78 variables were selected by expert consensus - 55 of which were derived from video review. The remaining demographic and outcome variables will be abstracted from EMRs. A representative selection of variables and their definitions are presented in the form of a data collection sheet in Figure 1. These variables will be obtained by trained video reviewers at each site.

Conclusion: The establishment of REVIVED - a video review-based, multi-center EDCA data registry - offers promising new avenues for systematic data collection with greater accuracy and reduced bias. By collecting data only made possible through cardiac arrest video review, the REVIVED collaborative aims to study factors contributing to prolonged chest compression interruptions as the first of many projects.

REVIVED Video Review Data Collection Sheet

Please consider each variable definition when reviewing videos. Select from the response options or fill in the blank(s).

Variable	Response Options	Definition
Bystander CPR initiated	Yes | No | Unknown	As stated by EMS during handoff
Estimated downtime	__ __ : __ __ : __ __ (HH:MM:SS)	
Witnessed arrest	Yes | No | Unknown	
Initial and most recent EMS rhythms	VF | VT | PEA | Asystole | ROSC Unknown	
CPR start time on video review	__ __ : __ __ : __ __ (HH:MM:SS)	IHCA: time CPR initiated on video OHCA: time patient appears on video, CPR ongoing
Time of ED bed transfer	__ __ : __ __ : __ __ (HH:MM:SS)	Time when transfer to ED stretcher completed
Time of ED defibrillator pads	__ __ : __ __ : __ __ (HH:MM:SS)	Time pads are placed and connected to defibrillation device – if not already placed by EMS
Defibrillation pad placement	Anterior-Posterior | Anterior-Lateral Both | Inappropriate locations	Pad placement as determined by video reviewer – Reference diagram by *Cheskes et al, 2022*
Time of initial ED rhythm	__ __ : __ __ : __ __ (HH:MM:SS)	Verbalized by provider or identified on monitor by video reviewer
Time(s) of defibrillation attempt(s)	__ __ : __ __ : __ __ (HH:MM:SS)	Time(s) of defibrillation(s) visualized by video reviewer
Time of first ED shockable rhythm	__ __ : __ __ : __ __ (HH:MM:SS)	Time of first shockable rhythm as determined by ED team
Initial ED rhythm	VF | VT | PEA | Asystole | ROSC Unknown	Verbalized by provider or identified on monitor by video reviewer
Start(s) and end(s) of chest compression interruption(s)	__ __ : __ __ : __ __ (HH:MM:SS) __ __ : __ __ : __ __ (HH:MM:SS)	Interruptions are pauses >2 seconds of manual or mechanical CPR
Reason(s) for chest compression interruption(s)	Intubation | Pulse check | Ultrasound Central Line Placement TEE Placement | MCCD Placement Other, specify: _____	
Type of airway by EMS upon arrival	None | ETT | LMA | King Combitube	Airway device verbalized by EMS during handoff or identified by video reviewer
Start(s) and end(s) of ED intubation attempt(s)	__ __ : __ __ : __ __ (HH:MM:SS) __ __ : __ __ : __ __ (HH:MM:SS)	Intubation start time: passage of blade into mouth Intubation end time: removal of blade (unsuccessful attempt) or stylet (ET tube placed)
Airway confirmation method	End tidal CO2 | Auscultation Laryngoscopy | Unknown | None	Verbalized by provider or end-tidal identified by video reviewer on monitor
Start(s) and end(s) of ROSC episode(s)	__ __ : __ __ : __ __ (HH:MM:SS) __ __ : __ __ : __ __ (HH:MM:SS)	ROSC start time(s): time palpable/doppler pulse or blood pressure by cuff/arterial line consistent with ROSC verbalized by provider ROSC end time(s): time chest compressions are resumed
Rhythm(s) during ROSC episode(s)	Sinus | A-fib | Junctional/Heart Block VT | Unknown	Verbalized by provider or identified on monitor by video reviewer
Pulse check method (each)	Manual | Ultrasound | Both	
Pulse check location (each)	Carotid | Femoral | Brachial Radial	
Was CPR stopped for non-medical reasons?	Yes | No	If yes, document as free text

Abbreviations
ICHA = In-Hospital Cardiac Arrest, OHCA = Out-of-Hospital Cardiac Arrest, VF = Ventricular Fibrillation, VT = Ventricular Tachycardia, PEA = Pulseless Electrical Activity, ROSC = Return of Spontaneous Circulation, TEE = Transesophageal Echocardiography, MCCD = Mechanical Chest Compression Device, ETT = Endotracheal Tube, LMA = Laryngeal Mask Airway, CPC = Cerebral Performance Category

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111 Impact of Pharmacist Preparation of Four-Factor Prothrombin Complex Concentrate at the Bedside in Patients With Life-Threatening Hemorrhage in the Emergency Department

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Study Objectives: Expert guidelines recommend prompt reversal of anticoagulation-induced hemorrhage with four-factor prothrombin complex concentrate (4F- PCC). Pharmacist presence at the bedside has been shown to reduce order entry to administration and door-to-needle (DTN) times in the emergency department (ED), leading to improved patient-centered outcomes. The effect of pharmacist preparation of 4F-PCC at the bedside on administration times has not been thoroughly studied. The purpose of this study was to assess if beside pharmacist preparation of 4F-PCC could improve ED administration times in the setting of a life-threatening hemorrhage.

Methods: This retrospective cohort study included anticoagulated patients requiring emergent reversal with 4F-PCC in the ED from 2019 to 2023. Those included were anticoagulated with a direct oral anticoagulant (DOAC) or vitamin K antagonist (VKA) with an elevated international normalized ratio (INR) in the setting of a life-threatening hemorrhage or need for an emergent procedure or operation. Patients in the post-intervention group (post-group) who had 4-PCC prepared at the bedside were compared to a historical group (pre-group) without bedside 4F-PCC preparation. The primary outcome was time from 4F-PCC order entry to administration. Secondary outcomes included ED admission to 4F-PCC DTN times, hemorrhage confirmation to 4F-PCC administration times for those patients presenting with an intracerebral hemorrhage (ICH), hospital length-of-stay (LOS) in days, and in-hospital mortality.

Results: Of 193 patients evaluated, 99 (51.3%) were included (n=41 pre-group; n=58 post-group). There was a significant 11-minute difference in median time from order entry to administration favoring the post- group (20 min vs 31 min, $p<0.001$). The subset of patients with ICH in the post-group also had a significantly shorter order to administration time of 14 minutes (17 min vs 31 min, $p<0.001$). There was no difference in overall DTN times, in-hospital mortality, or LOS between groups, including the subset of patients of ICH. There was a statistically significant 25.5-minute reduction in computed tomography (CT) scan confirmation of ICH to administration time in the post-group (35.5 min vs 61 min, p=0.04).

Conclusion: 4F-PCC preparation at the bedside by an ED pharmacist significantly reduced the 4F-PCC order to administration time. However, this intervention did not reduce overall DTN times, hospital LOS or in-hospital mortality. Further study is needed to investigate additional ways to decrease DTN times.

No, authors do not have interests to disclose

112 High Altitude Pulmonary Edema Response to Continuous Airway Positive Pressure: The HAPER CAPER Trial

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Study Objectives: Morbidity and mortality in cardiogenic pulmonary edema has been dramatically reduced by the intervention of noninvasive positive pressure airway maneuvers. The value of continuous positive airway pressure in the treatment of high altitude pulmonary edema (HAPE) is uncertain. We conducted a study to evaluate the efficacy of continuous positive airway pressure (CPAP) in HAPE.

Methods: A prospective, multicenter, double-blinded, randomized controlled trial of high flow oxygen with CPAP (10 cm of water) versus sham CPAP with high flow oxygen was performed to measure the speed of resolution of HAPE. We randomly assigned dyspneic adults with a maximum oxygen saturation of 85%, recent arrival at high altitude and a noncardiogenic pulmonary edema pattern on chest radiograph to receive CPAP treatment plus usual care (CPAP group) or usual care alone with the delivery of high flow oxygen through a CPAP mask with an inoperable pressure valve (control group) to maintain blinding. The primary end point was the ability to maintain oxygen saturation above 92% while on two liters of nasal oxygen with mild exertion while at high altitude.

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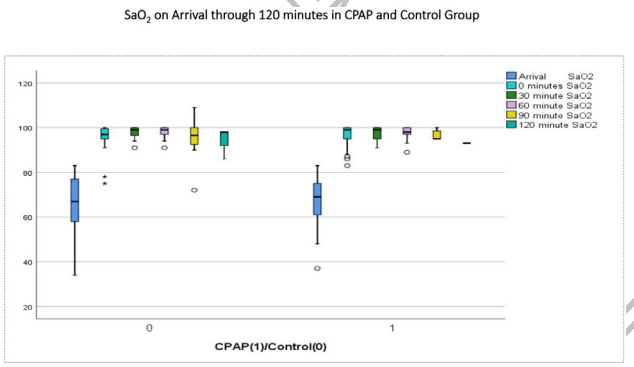
Results: When the CPAP (n=31) and control (n=27) groups were compared, demographic and clinical characteristics were similar. No statistically significant difference by group was noted for age (36+12 years), sex (94.8%), native altitude, tobacco use, co-morbidities, days from arrival to dyspnea (1.28 days), or days of dyspnea prior to admission (1.74 days). A similar proportion in each group exhibited cough on presentation, 79.3%. Baseline assessments were similar by group and demonstrated HAPE: average SaO2, respirations, heart rate, systolic, and diastolic pressure were 66.6+12.8%, 26.6+3.2 breaths/ minute, 105+17 beats/ minute, and 149+18/92+15 mm Hg. After randomization, no statistically significant differences in vital signs were observed when comparing CPAP and control HAPE patients at time 0, and at 30, 60, and 90 minutes. Overall, at time 0, mean SaO2, respirations, and systolic pressure were improved for both groups on supplemental oxygen: 96+5 %, 19.4+2.3 breaths/ minute, 140+17/93+15 mm Hg (all $p < 0.003$). Overall time to discharge was also similar in the CPAP and control groups, 158+62 vs 178+87 minutes ($t=1.053$, $p = 0.297$).

Discussion/Conclusion: Both CPAP with high flow oxygen and high flow oxygen alone are highly effective in the treatment of HAPE. Both show efficacy in improving the vital signs derangements by HAPE. CPAP is as effective as the standard therapy for HAPE; however, CPAP requires significantly more oxygen and resources than high flow oxygen but confers no measurable improvement in time to resolution of HAPE.



Yes, authors have interests to disclose
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Grant Support Pulmodyne and LECOM

113 Adverse Events During Emergency Intubations in Neurocritical Patients

Maia IWA, Paro V, e Silva LOJ, von Hellmann R, Hajjar LA, Garcia Alencar JC, Guimarães HP, Maccagnan Pinheiro BA, Bellolio F/University of São Paulo - Brazil; Mayo Clinic, Rochester, MN, Rochester, Minnesota, US

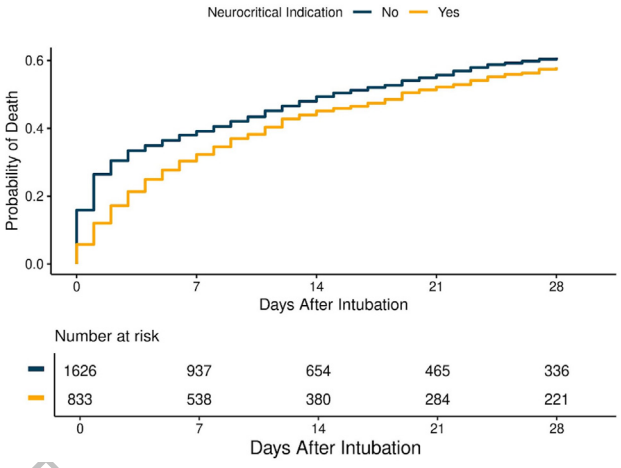
Study Objectives: Previous studies have yielded mixed results concerning the outcomes of neurocritical versus non-neurocritical patients. This study aims to describe the characteristics of emergency intubations and assess the risk of death within 28 days among neurocritical patients compared to non-neurocritical patients in Brazilian emergency departments.

Methods: This was a prospective multicenter airway registry in 18 Brazilian emergency departments, encompassing both academic and community hospitals. It included all adult (>18 years) emergency intubations over a 2-year period. We excluded intubations performed during cardiac arrest. Data was collected into a standardized data form. Patients were followed for 28-day outcomes. EDs needed at least 80% compliance rate with data entry to be included. Patients were categorized based on intubation indications related to the Central Nervous System (CNS) or non-CNS reasons. Univariate and multivariate analyses were conducted, assessing the 28-day post-intubation risk of death using Cox proportional hazard models, adjusted and unadjusted for factors including age, sex, number of intubation attempts, and major adverse events (severe hypoxemia, new hemodynamic instability, and cardiac arrest). Results were reported as hazard ratios (HRs) with 95% confidence intervals (CIs).

Results: A total of 2,459 patients were analyzed; 833 (33.9%) had CNS-related intubation indications, and 1626 (66.1%) had non-CNS indications. The median age for the CNS group was 63 years (IQR 49-72), with 58.6% males. Difficult airway impressions were more common in non-CNS cases (29.5%) compared to CNS cases (24.6%, p=0.01). The use of vasopressors was lower in the CNS group (16.9% vs 37.5%, p<0.001). Etomidate was the most common induction agent used, especially in the CNS group (66.4% vs 52.5%, p<0.001). Propofol usage was also higher in the CNS group (4.3% vs 2.7%, p<0.001). First pass success rates were similar between groups (74.1% CNS vs 73.2% non-CNS, p=0.64). Major adverse events were more frequent in non-CNS patients (38.4% vs 23.2%, p<0.001). The overall 28-day mortality rate was 55.7%. CNS patients had a lower risk of death compared to non-CNS patients (HR = 0.84, 95% CI: 0.74 - 0.94, p = 0.002). However, after adjusting for demographics, intubation attempts, and major adverse events, the risk of death was not significantly different (HR = 0.92, 95% CI: 0.81 - 1.02, p = 0.12).

Conclusion: The findings suggest that while neurocritical status may influence immediate post-intubation adverse events, it does not independently predict long-term mortality when other key risk factors are considered. This emphasizes the importance of managing immediate complications and optimizing intubation practices to enhance survival outcomes for all critically ill patients.

Figure 1: Kaplan-Meier cumulative incidence of patient death within 28 days of intubation



No, authors do not have interests to disclose

114 Comparing Standard vs Modified Placement Techniques of a Gastroesophageal Balloon Tamponade Device During Simulated Massive Upper Gastrointestinal Hemorrhage

Hase T, Hulin B, Lucas A, Watts H, Ndiaye C, Putman M/Advocate Christ Medical Center & University of Illinois College of Medicine, Chicago, Oak Lawn, Illinois, US

Study Objectives: Massive upper gastrointestinal (GI) bleeding secondary to esophageal and gastric varices causes significant morbidity and mortality in patients with portal hypertension and cirrhosis. Competency in treating patients with massive upper GI bleeding is critical for physicians practicing in both the emergency department (ED) and Critical Care settings. Definitive treatment generally includes endoscopy, embolization, and/or transjugular intrahepatic portosystemic shunt placement; however, access to these procedures may be limited or delayed, necessitating placement of a gastroesophageal balloon tamponade (GEBT) device. GEBT device placement is challenging, and proceduralists often encounter difficulty passing the tube beyond the mid-esophagus due to its length and soft/flexible consistency. Prior methods to improve placement success have proven ineffective. It is important to identify and train with a method that uses readily available equipment found in the ED. Given the time-sensitive nature of placement, a method that is efficient and associated with high first-pass success is of interest. The purpose of this simulation-based study was to determine if a modified placement technique using a bougie tracheal tube introducer was associated with improved time to completion and first-pass success compared to standard placement technique of a GEBT device, specifically a Sengstaken-Blakemore tube.

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Methods: This was an unblinded, randomized control crossover trial involving Emergency Medicine residents in all levels of training at a single site. Participants were given an instructional video created by content experts with instruction on both standard and modified techniques. Participants were randomized to complete either the standard technique or the modified, bougie-assisted technique. A novel task trainer with an expandible neo-stomach and airway contamination system was created to simulate massive upper GI bleeding. Participants were able to choose their visualization technique, either direct or video-assisted, and Magill forceps were available for use. Time to completion, first-pass success, and number of attempts were recorded. Procedure failure was defined as inability to place GEBT device after 15 minutes. Four to eight weeks later, residents then performed GEBT device placement using the alternate technique for comparison. As the continuous variable of time was found to have a normal distribution by the Shapiro-Wilk Test, a paired T-test was used as comparison. Chi-Square and Fisher's Exact tests were used to assess differences in categorical variables. A p-value of <0.05 determined statistical significance.

Results: 38 subjects participated in this crossover trial. There were six procedure failures (16%) using standard technique and none using the modified technique. Average time to completion using the standard and modified techniques were 458.84 (STD 155.51) seconds and 311.18 (STD 103.28) seconds, respectively. See Figure 1. This difference was statistically significant ($p = 0.0003$). There was also a statistically significant increase in first-pass success when using the modified technique ($p = 0.00003$). 8 participants (21%) had first-pass success using the standard technique, and 26 participants (68%) had first-pass success with the modified technique.

Conclusion: The modified, bougie-assisted technique for GEBT device insertion was associated with significantly higher rates of first-pass success and faster time to completion in a simulated massive upper GI bleed. This work adds to the limited body of evidence supporting the use of a tracheal tube introducer to mitigate the difficulties encountered when inserting a GEBT device in vivo.

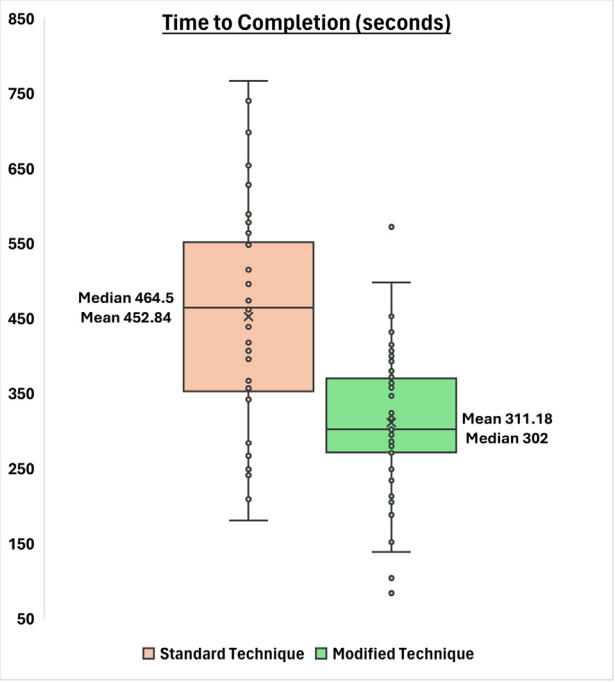

Figure 1: Boxplot demonstrating differences in mean and median completion times as well as the rage of completion times for standard vs modified placement techniques. Difference is statistically significant by paired t-test, p-value = 0.0003.

No, authors do not have interests to disclose

115 Pediatric Emergency Department In-Situ Simulation Program

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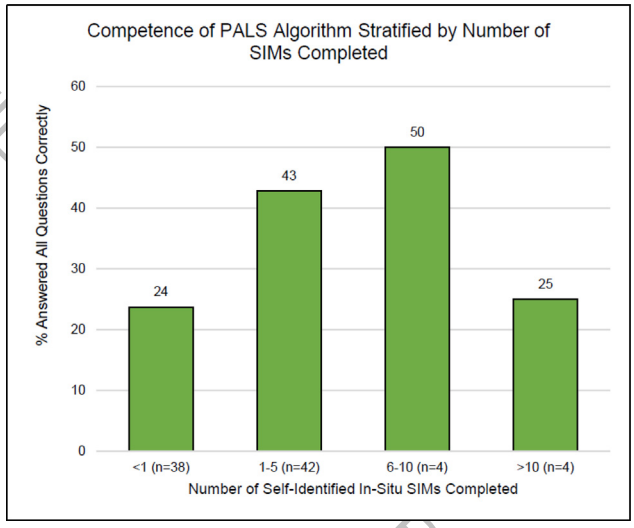
Background: The survival of pediatric patients requiring cardiopulmonary resuscitation (CPR) for cardiopulmonary arrest (CPA) depends on optimal and timely resuscitation consistent with professional guidelines. Studies in pediatric settings show improved CPR performance using simulations (SIMs). Creating an environment in which Pediatric Emergency Department (PED) personnel are prepared to provide optimal CPR remains challenging.

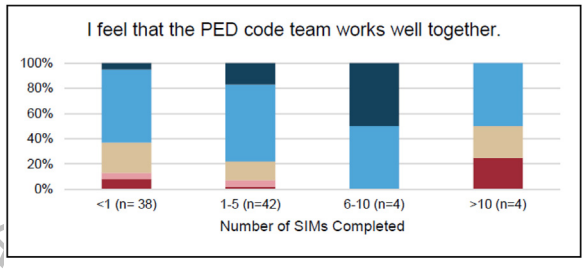
Study Objective: The objective of our study was to demonstrate the feasibility of an in-situ SIM program in the PED. The study evaluated the association between both competence with PALS algorithms and participation in in-situ SIMS and evaluated confidence with performing resuscitation and participation in in-situ SIMS.

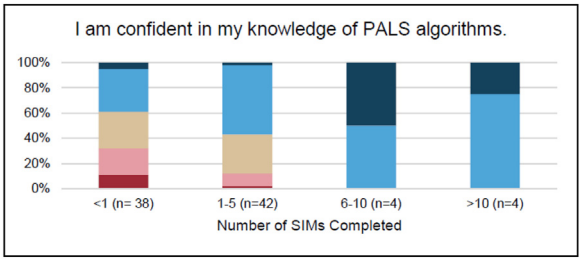
Methods: In-situ SIMS of pediatric cardiac arrest were performed twice per week with on-shift staff consisting of physicians, nurses, paramedics, advanced practice providers (APPs), trainees, and students. SIM participant demographic information and sim completion rate were collected. PED staff completed RedCap surveys which evaluated confidence in performing resuscitation and competence of PALs algorithm at 0 and 6 months of the study. Skip logic was used to target specific questions toward individuals in specific roles in the PED.

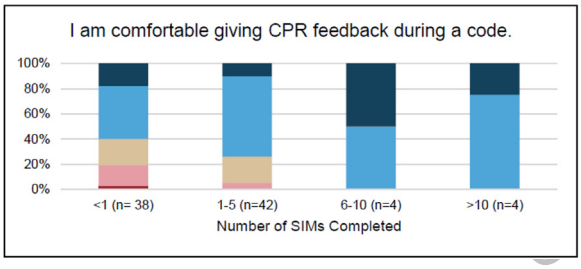
Results: See attached images.

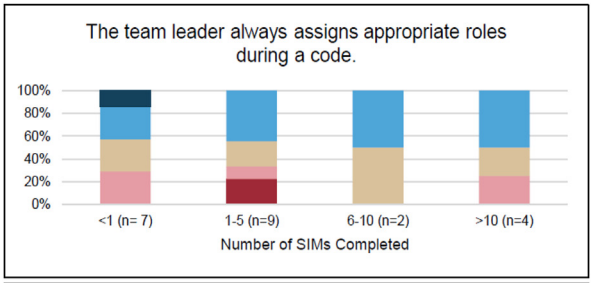
Conclusions: In-Situ SIMs can be performed in the PED setting by on-shift staff. 62.9% of schedule SIMs were completed over 6 months. There was an association between PALS competence and an increased number of SIM completions, up to 10 SIMs. All team members demonstrated improved confidence in performing resuscitations with increased SIM completion.

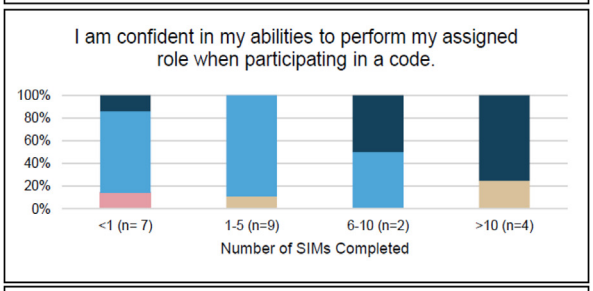


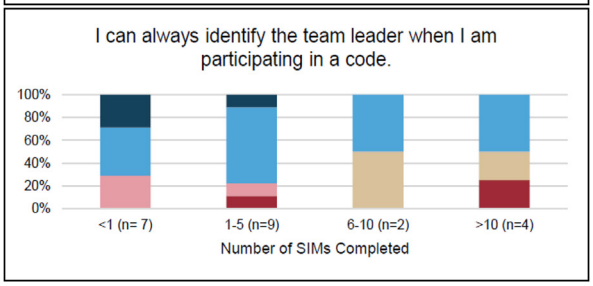


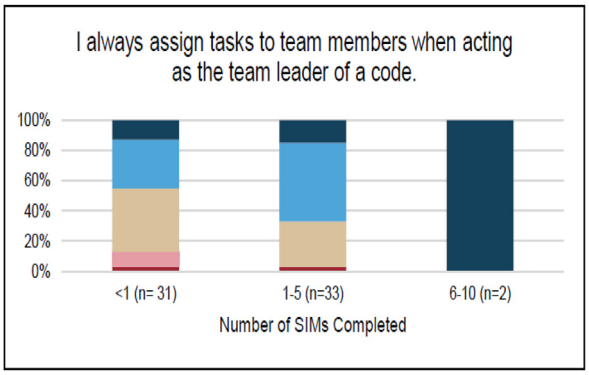


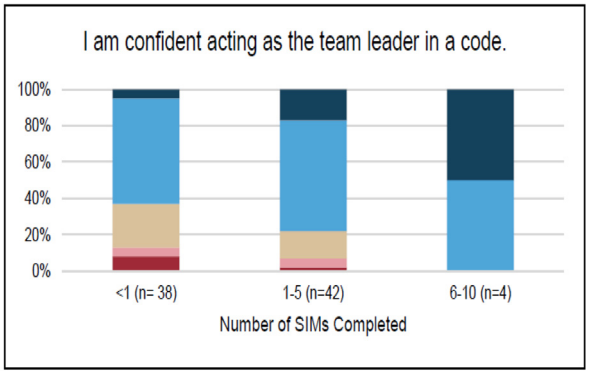


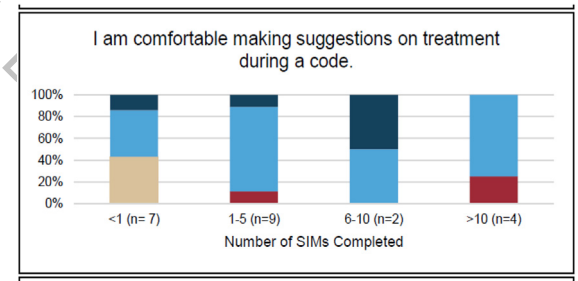


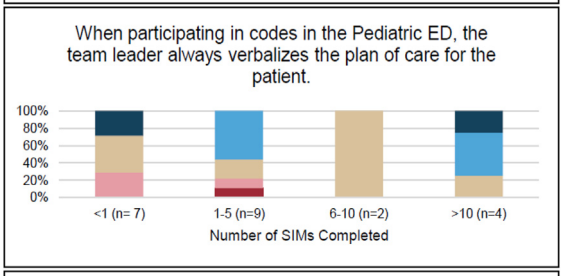


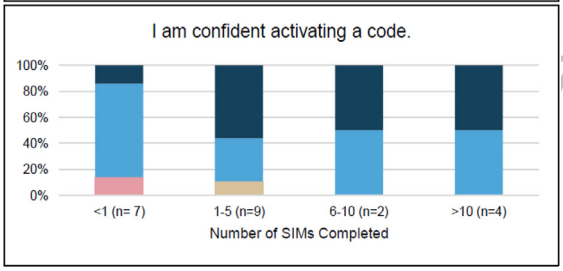












No, authors do not have interests to disclose

116 Emergency Medicine Resident Attitudes Surrounding Resuscitation of a Critically Ill Child: Overcoming Obstacles Using a Novel Form of Simulation

Theiler C, Harland K, Miller D, Shekem N/University of Iowa Carver College of Medicine, Iowa City, Iowa, US

Study Objectives: Although pediatric (peds) patients make up approximately 20% of all emergency department visits in the USA, Emergency Medicine (EM) residents have limited exposure to critically ill children. Despite this, after graduation, they are expected to be an expert in the management of ALL acute and life-threatening conditions. Both Pediatric and EM governing bodies have acknowledged the importance of peds-specific education in EM residency training, but given the low frequency of actual clinical exposure, training programs cannot rely solely on clinical experiences. At our institution, we observed that despite the need for more peds experience, when given the opportunity to care for a critically ill child, EM residents were less likely to step into the team leader role compared to similar adult scenarios. This phenomenon has also been described by others, and we hypothesized that it was largely due to lack of peds-specific knowledge & skill limitation due to infrequency. We aimed to better understand EM residents' experience and perceived barriers to taking on the team leader role in the resuscitation of a critically ill child; and through a novel form of simulation involving Rapid Cycle Deliberate Practice (RCDP) and rotating hands-on skill simulation stations, we sought to improve residents' confidence and skill in the team leader role, as well as improve their knowledge of peds-specific equipment and procedures.

Methods: This study took place at a tertiary care institution with a 3-year EM residency. Residents participated in a half-day workshop consisting of small groups rotating through a simulated peds cardiac arrest case and four separate hands-on peds airway skill simulation stations, with RCDP used at each. Residents took a survey immediately after the session to 1) assess baseline experience and attitudes, and 2) assess the impact of the curriculum on learner confidence and perceived skill in peds resuscitations, comparing pre- and post-workshop levels in 16 categories using a 5-point Likert scale, with assessment of mean difference using a paired t-test, with p value < 0.05 being statistically significant.

Results: 21 EM residents participated. Average age was 30 years, 62% were male, all but one was PALS certified. The majority (86%) had participated in <10 peds resuscitations, and even fewer had taken on the team leader role; in contrast to adult resuscitations in which the majority had participated in >15. Residents cited not having enough experience and lack of expertise with peds medication dosing as the primary obstacles that might prevent them from taking on the team leader role in a peds resuscitation. Following the workshop, residents had a statistically significant improvement in mean confidence level and perceived skill in peds resuscitations in 12/16 categories. 80% reported an increase in confidence level and skill as team leader, 90% reported an improvement in communication skills, and 67% reported an improvement in their ability to manage the peds airway.

Conclusion: Peds-specific education is an important part of EM residency training, however actual clinical exposure to critically ill children is limited. We found that EM residents had participated in far fewer peds resuscitations compared to adult, and identified lack of experience & lack of peds medication dosing expertise as barriers to taking on the team leader role. Following participation in a novel half-day workshop using RCDP and consisting of rotation through a peds cardiac arrest simulation and four hands-on peds airway skill simulation stations, EM residents had a statistically significant improvement in mean confidence level & perceived skill surrounding peds resuscitations.

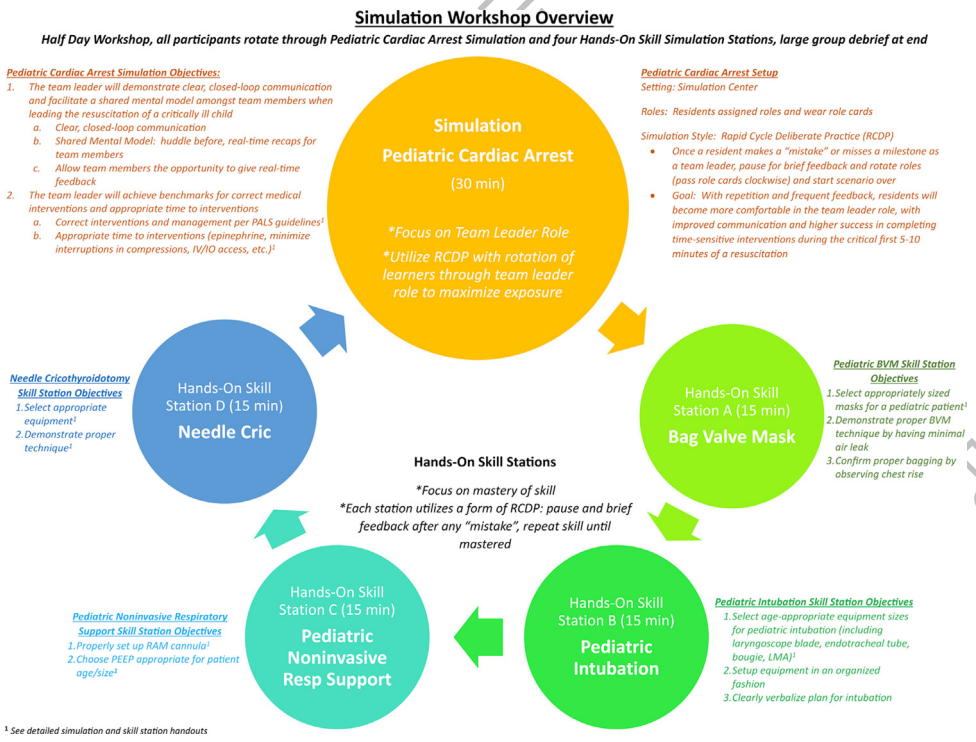


Table 1. Characteristics and Baseline Experience of Participants

Demographic	Level	N = 21
Age (years)	--	29.8 (25-44)
Sex	Female	8 (38%)
	Male	13 (62%)
Degree	MD/DO	17 (80%)
	PA/NP	4 (20%)
Training Level	PGY1	5 (24%)
	PGY2	8 (38%)
	PGY3	4 (19%)
	APP Resident	4 (19%)
PALS Certified	Yes	20 (95%)
	No	1 (5%)
How many PEDIATRIC RESUSCITATIONS do you estimate you have cared for as a resident in the ED?	< 5	7 (33%)
	5-10	11 (52%)
	11-15	2 (10%)
	> 15	1 (5%)
In how many of these have you assumed the team leader role?	< 5	14 (67%)
	5-10	6 (29%)
	11-15	1 (5%)
	> 15	0
How many ADULT RESUSCITATIONS do you estimate you have cared for as a resident in the ED?	< 5	4 (19%)
	5-10	2 (10%)
	11-15	3 (14%)
	> 15	12 (57%)
In how many of these have you assumed the team leader role?	< 5	7 (33%)
	5-10	3 (14%)
	11-15	2 (10%)
	> 15	9 (43%)
Approximately how many PEDIATRIC CODES have you participated in as a resident in the ED?	< 3	14 (67%)
	3-5	5 (24%)
	6-10	1 (5%)
	>15	1 (5%)
In how many of these have you assumed the team leader role?	< 3	19 (90%)
	3-5	1 (5%)
	6-10	1 (5%)
	>15	0
Approximately how many ADULT CODES have you participated in as a resident in the ED?	< 3	6 (29%)
	3-5	2 (10%)
	6-10	9 (43%)
	>15	4 (19%)
In how many of these have you assumed the team leader role?	< 3	10 (48%)
	3-5	5 (24%)
	6-10	4 (19%)
	>15	2 (10%)
*What do you perceive as obstacles that might prevent you from taking on a team leader role in a PEDIATRIC resuscitation or code?**		
Not enough actual patient experience		16 (76%)
Medical knowledge deficits		11 (52%)
Emotional toll of caring for a critically ill child		0
Lack of expertise with pediatric medication dosing		14 (67%)
Training has not adequately prepared me		6 (29%)
Lack of experience with procedures		5 (24%)
Parent/caregiver interaction		0
Uncomfortable with pediatric equipment size		7 (33%)

**Participants were allowed to select multiple answers to this question*

Table 2. Pre- and Post-Simulation Self-Assessment

Resident participants were asked to rate their ability for each of the following statements using a 5-point Likert scale: 1 = "Strongly Disagree", 2 = "Disagree", 3 = "Neutral", 4 = "Agree", 5 = "Strongly Agree"

	Question	Before Simulation	After Simulation	Delta	p-value*
1	I am comfortable taking care of a critically ill child	2.57	3.38	0.81	**<0.0001**
2	I feel prepared to take on the team leader role in a pediatric resuscitation or code	2.62	3.38	0.76	**<0.0001**
3	I feel prepared to manage the airway of a critically ill child	3.10	3.57	0.48	**0.0044**
4	I am comfortable with pediatric equipment sizing	2.90	3.33	0.43	**0.0009**
5	I can locate pediatric equipment in my ED	3.19	3.57	0.38	**0.0168**
6	I have a go-to reference for pediatric dosing and equipment sizing	3.76	4.00	0.24	0.3658
7	I am able to clearly assign team member roles as team leader in a pediatric resuscitation or code	3.52	4.05	0.52	**0.0007**
8	I am able to facilitate closed loop communication as team leader in a pediatric resuscitation or code	3.62	3.90	0.29	**0.0104**
9	I am able to promote effective communication among members of a team	3.62	3.86	0.24	0.1349
10	I am able to actively listen to team members' ideas and concerns	4.14	4.38	0.24	**0.0212**
11	I am able to provide constructive feedback to team members	3.33	3.57	0.24	**0.0212**
12	I am able to work effectively with team members to enhance care	3.76	4.00	0.24	**0.0212**
13	I am able to effectively communicate with a pediatric patient's family during a pediatric resuscitation or code	3.29	3.38	0.19	0.1036
14	I feel comfortable with a parent's presence during a pediatric resuscitation or code	3.00	3.19	0.19	0.1036
15	I am able to clearly communicate my plan of care as team leader during a pediatric resuscitation or code	3.00	3.57	0.57	**0.0003**
16	I am able to clearly verbalize my plan for pediatric airway management in an emergency setting	3.19	3.81	0.62	**0.0004**

*P-value for mean difference (paired t-test)

Table 3. Post-Simulation Self-Assessment

Resident participants were asked to rate their ability following the simulation compared to their ability prior to the simulation workshop using the following scale:
1= much worse now, 2=somewhat worse now, 3=unchanged, 4=somewhat better now, 5=much better now

Question	Rating 1	2	3	4	5	Average
Confidence in taking on the team leader role in a pediatric resuscitation or code	0	1	3	13	4	3.95
Skill as a team leader in a pediatric resuscitation or code	0	0	4	15	2	3.90
Communication as a team leader in a pediatric resuscitation or code	0	1	1	17	2	3.95
Ability to manage the pediatric airway	0	0	7	10	4	3.86

No, authors do not have interests to disclose

117 Evaluating the Accuracy and Provider Wellness Impact of an Ambient Artificial Intelligence Scribe in a Complex Simulated Emergency Department Environment

Hata R, Jones C, Seitz D, Tummala A, Moore M, Cooper D/Indiana University School of Medicine, Indianapolis, Indiana, US

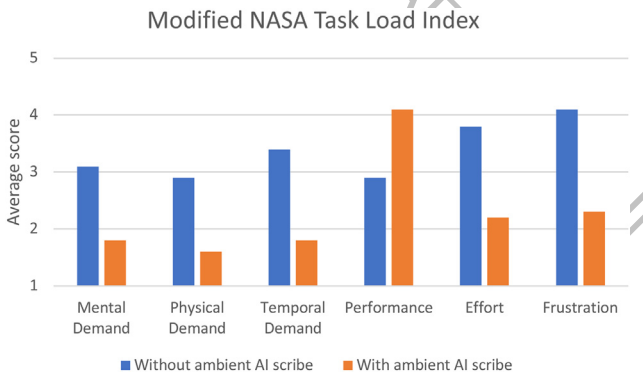
Study Objectives: Due to increasing workloads providers frequently turn to scribe services to improve efficiency and decrease their non-clinical tasks. One of the most promising technologies to improve clinical workflow and provider wellness is ambient artificial intelligence (AI) scribe software. Despite potential advantages, there is little evidence indicating how these types of technologies perform in a complex emergency department (ED) environment. This study seeks to evaluate the accuracy of an AI scribe and its impact on provider cognitive load, physical load, and wellness.

Methods: Seventeen emergency medicine providers participating in a complex multi-patient simulation exercise were asked to assess the accuracy and provider wellness impact of a commercially available ambient AI scribe on the following categories: previous experience, AI scribe note accuracy, cognitive and physical load, and wellness. Scenarios were divided into groups A (4 patients) and B (3 patients), with each scenario having built in disruptions, multiple data sources, and task switching. The AI scribe was used to generate a note for each patient encounter. After completion of the exercise participants reviewed the AI scribe generated note and completed a 4-part survey. Institutional IRB protocols were followed and informed consent was obtained for all participants.

Results: Sixteen participants reported a score of 1, or "very little experience," with AI scribe technology. One participant did not complete the question. AI scribe note accuracy was assessed using a 5-point Likert scale, with 1 being "very inaccurate" and 5 being "very accurate." Mean accuracy and range were: scenario A 3.4 [1-5]; scenario B

3.7 [1-5]; all encounters 3.5 [1-5]. Cognitive and physical load without and with an AI scribe was assessed using a modified 5-point Likert scale NASA Task Load Index across 6 categories, with 1 being "very low" and 5 being "very high." Mean and range values were as follows: mental demand without, 3.1 [1-5], with, 1.8 [1-4]); physical demand without, 2.9 [1-5], with 1.5 [1-3]); temporal demand without, 3.4 [1-5], with, 1.8 [1-3]); performance without, 2.9 [1-4], with, 4.1 [2-5]); effort without, 3.8 [3-5], with, 2.2 [1-4]; and frustration without, 4.1 [3-5], with, 2.3 [1-3] (Figure). A modified University of California Wellness Inventory was used to assess impact on provider wellness using a 5-point Likert scale, with 1 being "strongly disagree" and 5 being "strongly agree" for the following questions: Question 1: This technology will improve my overall efficiency in clinical and non-clinical work. Question 2: This technology will allow me to spend less overall time on work. Question 3: This technology will increase the proportion of time and ease that I will be able to spend engaging with patients. Question 4: The technology will free up time away from work. Mean and range scores were: question 1, 4.2 [3-5]; question 2, 4.3 [4-5]; question 3, 4.6 [4-5]; question 4, 4.4 [3-5].

Conclusion: This study shows that there may be limitations in accuracy of notes generated by AI scribes in a complex, multi-patient environment. When using an AI scribe cognitive and physical workload, as well as provider wellness was positively impacted. Mental, physical, and temporal demand, frustration, and effort were reduced. Perception of performance increased. Participants also felt that AI scribe technology would improve their overall work efficiency, allow them to spend less overall time on work, increase the proportion of time and ease that they will be able to spend with patients, and free up time away from work.



No, authors do not have interests to disclose

118 Broselow Color-Coded Crash Cart vs Standard Crash Cart in Simulated Pediatric Resuscitation

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Background: Response time in emergency situations is critical for optimum care. The standard crash cart (SCC) used during resuscitation arranges equipment by intervention. The pediatric population, with its great variability in size, provides an additional challenge in terms of equipment size selection and dosage calculation. A color-coded crash cart (CCCC) has equipment arranged by size as recommended on the Broselow tape so only one drawer is accessed, saving valuable time. Comparing both carts in one study showed that equipment was located and used significantly faster with the CCCC. The use of pre-filled color coded syringes (CCS) in another study decreased medication dosing errors as well, with significantly less critical errors. This is the first study to assess both equipment and medication retrieval time. We compared emergency physicians' (EMP) response time and accuracy in selection and use of resuscitative equipment and medications during simulated pediatric cases with a Broselow CCCC vs SCC.

Methods: After obtaining ethical approval, we conducted a prospective, cross-over trial over two days in which teams (1 EMP, 2 residents, 1 nurse) were asked to run two simulated pediatric resuscitations in the same day. The order of the cases and pairing with either cart were randomized for each team, however; all teams started with the standard cart to ensure they were blinded to the aim of the study. Four video recording devices were utilized to evaluate response time, which was defined as time from ordering equipment or a medication dose to time of successful retrieval of weight-appropriate sized equipment or dose.

Results: Of the 7 teams that participated, there were 4 EMP and 3 Pediatric EMP, 8 EM residents, 6 pediatric residents, and 7 nurses. Response times for airway devices (endotracheal tubes and laryngoscopy blade) and airway adjuncts(oropharyngeal airways, nasal trumpets, and laryngeal mask airways) were significantly faster in the CCCC group compared to the SCC (Table 1). Medication doses were also prepared for administration relatively faster with the prefilled CCS (Table 2). In addition, of 22 medication doses administered using the SCC, 3 dosing errors occurred, 2 of which were critical dosing errors, whereas no errors occurred across 24 doses administered with the prefilled CCS.

Conclusion: Use of a CCCC along with prefilled CCS significantly improved time to selection of airway equipment, medication doses, and avoided errors in selection altogether. Centers caring for pediatrics in the acute setting might provide more timely care with the use of CCCC.

Broselow Color-Coded Crash Cart vs Standard Crash Cart in Simulated Pediatric Resuscitation

Table 1: Mean Time (seconds±SD) to obtain appropriate medical equipment

Equipment	Time with Standard Cart	Time with Color-coded Cart	P-Value
Airway devices	41.7 ± 22	13.1 ± 6.9	0.00
Airway adjuncts	30.8 ± 17.4	13.8 ± 11.9	0.03

Table(2) : Time to medical delivery (seconds), conventional syringe versus color-coded syringe

	Conventional syringe		Colored syringe		Absolute difference 95% CI	
Variable	Median	95% CI	Median	95% CI		
All medications	19	15-38	16	11-17	9	0-37
Epinephrine	15	5-38	8	6-22	7	0-32
RSI medication	25	16-91	17	14-27	38	0.5-39.5

No, authors do not have interests to disclose

119 Exploring the Relationship Between Patient- and Neighborhood-Level Factors and Caregiver-Reported Unmet Social Needs and Interest in Community Resource Referral During Pediatric Emergency Department Visits

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Background: Unmet social needs (USNs) are common among families in the pediatric emergency department (PED) and contribute to poor health outcomes. Health inequities are associated with both patient- and neighborhood-level factors. However, there is limited understanding of the relationship between these factors and caregivers' reported USNs and interest in community resource referral (CRR) identified during a PED visit.

Study Objective: To explore the relationship between patient-level demographics and neighborhood-level factors and 1) caregiver-reported USNs and 2) interest in community resource referral.

Methods: This was a retrospective 1.5-year cohort analysis from an ongoing prospective study of children 0-17 years old with a completed social needs screener during a PED visit at a quaternary-level children's hospital. USNs were defined as one or more social needs reported on the electronic, self-administered p-SINCERE tool provided to caregivers during PED visits. Interest in CRR was also noted in the questionnaire. All caregivers who noted interest in CRR were contacted by the local United Way 211 within 48 hours. A comprehensive chart review was conducted on patients' electronic health records to extract demographic data and visit characteristics. We utilized the child opportunity index (COI) to assess the neighborhood-level factors. The primary outcomes were

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1) the presence of USNs and 2) the interest in CRR. Descriptive statistics were used to summarize patient demographics, clinical characteristics, and the COI. Bivariate comparisons and odds ratios were utilized to assess the association of individual- and neighborhood-level factors with 1) the presence of USNs and 2) the interest in CRR.

Results: From September 27, 2021 to April 30, 2023, 4,280 patients met the inclusion criteria for chart review. 2,065 caregivers reported USNs, while only 515 caregivers requested CRR (Table 1). The presence of USNs and interest in CRR significantly varied by preferred language, interpreter usage, insurance, lacking a PCP, and COI levels ($p<0.01$, Table 1). Increased odds of having USNs and interest in CRR were associated with language other than English, interpreter needed but not used, non-private insurance, lack of PCP, ED discharge, and lower COI ($p<0.01$, Table 2). Additionally, there were increased odds of having USNs for patients of Non-Hispanic White race/ethnicity status and patients with lower emergency severity index (ESI) triage levels. However, the effect of these factors on interest in CRR was not statistically significant.

Conclusion: Although USNs are common among patients/caregivers in a PED, presence does not equate to caregiver interest in referral. The disparities present in historically marginalized and vulnerable populations are evident in our sample and highlight the need for processes in healthcare settings, including the PED, that help mitigate the negative systemic impacts faced by these populations. Using both individual- and population-level data, like the COI, can improve CRR and PCP referrals for patients in need.

Figure 1: Presence of Unmet Social Needs by Child Opportunity Index

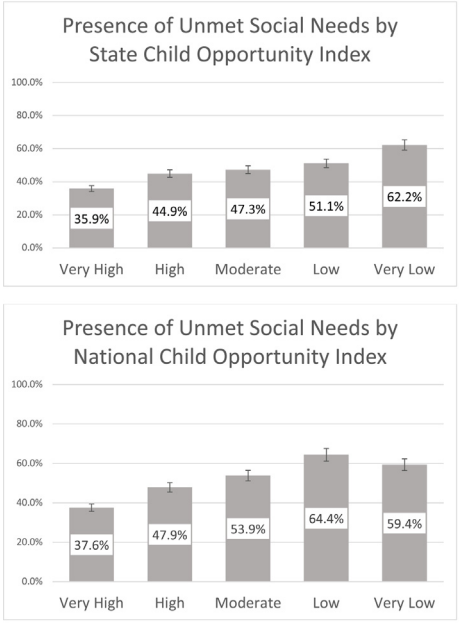

Figure 1 demonstrates the increasing percentage of USNs in neighborhoods with lower COI levels at state and nationally defined indices.

Table 1: Patient- and Neighborhood-Level Characteristics by Presence of Unmet Social Needs & Interest in Community Resource Referral

	Unmet Social Need(s) (USN)				Interest in Community Resource Referral			
	ALL	NO	YES	p-value	ALL	NO	YES	p-value
	4280	2215	2065		4280	3765	515	
Language preferred				< 0.001				<0.001
English	3910	2131	1779		3973	3613	360	
Spanish or Other	370	84	286		307	152	155	
Interpreter				< 0.001				<0.001
Did not Need	3910	2131	1779		3910	3561	349	
Needed and Used	88	17	77		88	43	45	
Needed but Not Used	282	67	215		282	161	121	
Race/Ethnicity from Screener				< 0.001				0.047
Non-Hispanic White	2706	1604	1102		2706	2371	335	
Non-Hispanic Black	58	19	39		58	54	4	
Hispanic	996	345	651		996	895	101	
Other	520	247	273		520	445	75	
Insurance on Screener				< 0.001				<0.001
Private	2716	1741	975		2716	2583	133	
Public	1411	431	980		1411	1091	320	
Uninsured	118	27	91		118	63	55	
Unknown	35	16	19		35	28	7	
PCP noted in Chart				0.003				<0.001
Yes	2325	1252	1073		2325	2109	216	
No	1955	963	992		1955	1656	299	
ESI Triage Level				< 0.001				0.25
1 – Resuscitation (Red)	89	60	29		90	79	11	
2 – Emergent (Orange)	700	362	338		667	576	91	
3 – Urgent (Yellow)	2709	1447	1262		2746	2415	331	
4 – Less Urgent (Blue)	760	338	422		757	675	82	
5 – Non-Urgent (Green)	20	7	13		20	20	0	
ED Disposition				0.006				0.07
Admitted	967	543	428		967	870	97	
Discharged	3287	1657	1630		3287	2871	416	
Transfer	26	15	11		26	24	2	
COI State				< 0.001				<0.001
Very High	1157	742	415		1157	1114	43	
High	661	364	297		661	606	55	
Moderate	721	380	341		721	650	71	
Low	640	313	327		640	548	92	
Very Low	1101	416	685		1101	847	254	
COI National				< 0.001				<0.001
Very High	1527	953	574		1527	1457	70	
High	1052	548	504		1052	942	110	
Moderate	982	453	529		982	829	153	
Low	618	220	398		618	462	156	
Very Low	101	41	60		101	75	26	

Description: Bivariate comparisons of the presence and absence of USNs for patient demographics, clinical characteristics, and COI levels.

Table 2: Odds Ratio for Patient- and Neighborhood-Level Characteristics by Presence of Unmet Social Needs & Interest in Community Resource Referral

	Presence of Unmet Social Needs			Interest in Community Resource Referral		
	Odds Ratio	p-value	95% CI	Odds Ratio	p-value	95% CI
Preferred LOE	2.98	<0.0001	2.44 - 3.64	10.23	<0.001	7.87 - 13.32
Interpreter Needed but Not Used	3.84	<0.0001	2.90 - 5.11	7.67	<0.001	5.85 - 10.05
Race/Ethnicity other than NHW	1.34	<0.0001	1.27 - 1.41	0.99	0.89	0.92 - 1.08
Insurance other than Private	1.87	<0.0001	1.76 - 1.99	2.25	<0.001	2.05 - 2.47
Lack of PCP	1.2	0.0028	1.07 - 1.36	1.76	<0.001	1.46 - 2.13
ESI Triage Level*	1.21	<0.0001	1.10 - 1.32	0.88	0.08	0.77 - 1.03
ED Discharge	1.26	0.0017	1.09 - 1.46	1.30	0.028	1.03 - 1.64
COI State*	1.28	<0.0001	1.23 - 1.33	1.54	<0.001	1.46 - 1.64
COI National*	1.38	<0.0001	1.31 - 1.45	1.8	<0.001	1.66 - 1.95

Description: Odds ratios were compared to the majority baseline in the variable unless indicated otherwise, as with ED discharge. *Indicates odds ratio approximate to one unit increase in the variable.
Abbreviations: USN = unmet social need; CRR = community resource referral; CI = confidence interval; LOE = language other than English; NHW = non-Hispanic White; ESI = emergency severity index; COI = child opportunity index.

No, authors do not have interests to disclose

120 Social Needs Screening in Emergency Medicine: Utilizing an Abridged PRAPARE Screening Tool

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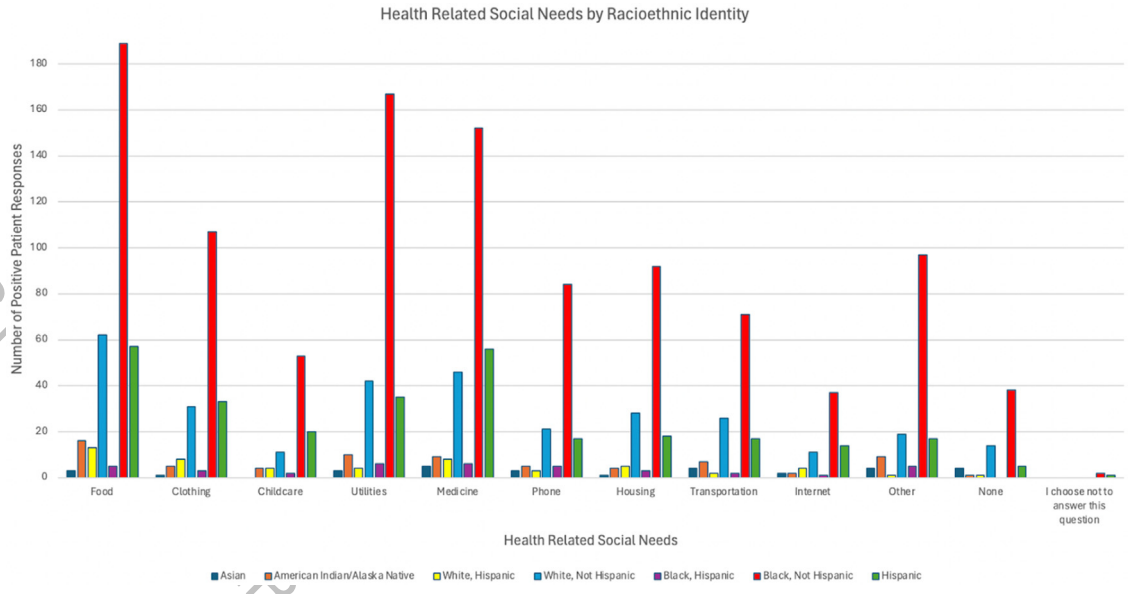
Study Objectives: The Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE) is a validated tool for screening patients for unmet social needs. The PRAPARE tool has been implemented in many clinical settings successfully, with short-form versions of the survey being found comparatively effective. It is widely accepted that unmet social needs can have significant impact on health outcomes, and lead to increased emergency department (ED) utilization. In this study, we evaluated the feasibility of administering an abridged PRAPARE survey in the ED setting, given the time constraints and necessity of efficient yet thorough screening.



Methods: From October 2021 to October 2023, patients presenting to the ED of an academic tertiary care medical center were offered social needs screening in addition to the abridged PRAPARE tool while in the waiting room. Trained student volunteers administered the survey during two scheduled 2-hour shifts (10AM and 5PM) daily during the study period. The original 21-question PRAPARE tool was shortened to 14 questions for brevity, reflecting the most prevalent social needs seen in the study institution's ED population. Quantitative responses were characterized using descriptive statistics.

Results: A total of 683 patients completed screening, with non-Hispanic Black as the major reported racioethnic identity (62% vs 18% non-Hispanic white vs 15% Hispanic). The majority of respondents were female (N=419; 61%) and between ages 25-35 (N=131; 19%). Nearly all patients (N=645; 94%) screened positive for at least one social need and 56% of these patients had 3 or more urgent needs. Food (47%), medicine (39%), and utilities (37%), were the most frequently cited cohort needs. Our cohort expressed significant social burden, with 27% lacking housing, 26% currently unemployed, 28% incurring transportation issues, and 15% feeling unsafe in their home. Black patients were overrepresented in our cohort vs ED census during the study period (62% v 40%). Following screening, 619 (96%) of patients with identified need(s) indicated that they would like assistance with their need(s).

Conclusion: The abridged PRAPARE survey demonstrated both feasibility and significant social burden in this convenience sampling ED setting. This is especially important given the high rate of racial and ethnic disparities regarding unmet social needs. Given the high rate of requested assistance, an abridged PRAPARE survey can effectively assess this at-risk population and facilitate interventions to address identified needs.

No, authors do not have interests to disclose

121 Enriching Patient Care in Downstate and Kings County Emergency Departments

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Background: Social determinants of health (SDoH) affect health outcomes and can influence adherence to medication regimens. Many emergency physicians in Downstate and Kings County have expressed concerns about social determinants of health (SDoH) affecting patient care. Despite these concerns, there is a lack of comprehensive data on the connection between SDoH and medication adherence specifically within the emergency departments (EDs) of Downstate and Kings County.

Methods: This was a prospective cross-sectional study conducted at two EDs to determine SDoH and medication adherence. We included adults (≥18 years) who spoke English and took ≥4 prescription medications or ≥1 "high risk" medication, including immunosuppressants, antiepileptics, sedative-hypnotics, anti-Parkinson agents, anticoagulants, antiplatelets, antihyperglycemics, or cardiovascular medications. Medications were deemed "high risk" by ED pharmacists based on their long-term usage and side effects. Patients completed a survey regarding demographics, social needs, and medication adherence. The survey was created through expert consensus and literature review and was pilot tested with cognitive interviewing. Data are as percentages with 95% confidence intervals.

Results: We enrolled 261 patients (53% female, mean age 62 years). Of this population, 36 (13.8%; 95% CI 9.9%-18.6%) reported unstable housing, 48 (18.4%; 95% CI 13.9%-23.4%) reported concern about having sufficient food, 55 (21.1%; 95% CI 16.3%-26.5%) reported always or sometimes having insufficient money to pay bills, and 65 (24.9%; 95% CI 19.8%-30.6%) neglected medical care due to distance or transportation. 65 (24.9%; 95% CI 19.8%-30.6%) reported running out of medicine sometimes or often, with 25 (9.6%; 95% CI 6.3%-13.8%) stating they would sometimes defer refilling medications due to cost. 35 participants (13.4%; 95% CI 9.5%-18.2%) reported difficulty in paying for medications and 36 (13.8%; 95% CI 9.9%-18.6%) reported difficulty in visiting the pharmacy.

Conclusion: Among patients presenting to the Downstate and Kings County ED who were on ≥4 prescription medications or ≥1 "high risk" medications, over one-third had social needs that impacted their medical care. The most commonly reported social needs were insufficient money to pay bills and difficulty accessing medical care due to transportation. The most common medication adherence issues were running out of medications and deferring medication refills due to cost. This study demonstrates the prevalence of social needs and medication adherence issues among patients across two inner-city EDs. Data suggest a large percentage of ED patients have social needs and issues adhering to medication regimens. Next steps include implementing routine social determinants of health screening, developing targeted patient education programs, and forming multidisciplinary care teams can collectively enhance patient care in Downstate and Kings County emergency departments by addressing identified social needs and improving medication adherence. When attending to patients within the EDs of Downstate and Kings County, healthcare practitioners ought to consider not only the medical exigencies but also the social needs and accessibility of medications, thereby fostering a more comprehensive and nuanced approach to patient care.

No, authors do not have interests to disclose

122 Implicit Bias in the Patient Descriptor "Homeless," and Its Association With Emergency Department Opioid Administration and Disposition

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Study Objectives: Biased language in provider documentation of marginalized patient populations has been shown to negatively influence patient management, such as with opioid prescriptions in patients with sickle cell anemia. There has been debate over the continued use of the word "homeless" as a descriptor of patients, as it is a

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potentially biased term with negative connotations. This study explores the relationship between the use of the word "homeless" in emergency department (ED) provider documentation and admission rates as well as intravenous (IV) vs oral (PO) opioid administration rates.

Methods: This single-center retrospective study used EPIC data from 2 University of California San Diego (UCSD) EDs. UCSD ED physician encounter notes from the calendar year 2021 were included if they met the following: 1) patient 18 years or older; 2) full demographics available, including age, sex, race, and ethnicity; 3) history of unstable housing documented elsewhere in the medical record in the past year. ED encounters with a disposition of admitted or discharged were included; eloped, left against medical advice, transferred, or jail/prison were excluded. 5,140 notes from 2,792 patients met all inclusion criteria. 2 cohorts were delineated: 1) (+)note group (934 patients; 1,351 notes) if the ED provider note contained the word "homeless"; 2) (-)note group (2,260 patients; 3,789 notes) if the provider note did not contain the word "homeless". For the admission vs discharge analysis, seven diagnoses in which ED provider judgment may contribute to disposition decision were selected: pneumonia, cellulitis, heart failure, COPD exacerbation, alcohol withdrawal, suicidal Ideation, and psychosis. For the opioid administration analysis, only patients who were discharged from the ED and administered opioids were included, since in admitted patients it could not be discerned whether opioids were given in the ED or the inpatient setting. Data management and statistical studies were done in R (version 2023.12.0).

Results: In the (+)note group, a total of 47 patients had a diagnosis of heart failure and 47 patients had a diagnosis of alcohol withdrawal, while within the (-)note, 117 patients carried a diagnosis of heart failure and 118 patients had a diagnosis of alcohol withdrawal. When controlling for sex, race, ethnicity, and age in a multivariate logistic regression, (+)note was a strong predictor of discharge rather than admission for both diagnoses: heart failure (OR: 0.45, CI: 0.23-0.87, $P = 0.016$) and alcohol withdrawal (OR: 0.45, CI: 0.23-0.86, $P = 0.016$). The other diagnoses lacked statistical significance. Within the (+)note group who were discharged from the ED, a total of 48 patients received PO opioids while 36 patients received IV opioids. Within the (-)note group who were discharged from the ED, a total of 87 patients received PO opioids while 157 patients received IV opioids. While controlling for demographics, a multivariate logistic regression revealed that (+)note was a predictor of ED treatment with PO rather than IV opioids (OR: 0.35, CI: 0.20-0.57, $P < 0.001$).

Conclusion: Biased language may influence other providers' perceptions of patients, as well as our own. In this study, when emergency physicians described patients as "homeless" in medical documentation, they were less likely to be admitted to the hospital for certain conditions and more likely to receive PO rather than IV opioids compared with those patients not labeled as "homeless." This study reinforces prior studies in how biased language may alter medical decision making.

No, authors do not have interests to disclose

123 Civil Monetary Penalties Related to Violations of the Emergency Medical Treatment and Labor Act Involving Psychiatric Emergencies: A 5-Year Update

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Study Objective: The Emergency Medical Treatment and Labor Act (EMTALA) requires that patients presenting to a dedicated emergency department (ED) have a timely medical screening evaluation (MSE), stabilization of emergent conditions, and transfer to a higher level of care if needed. The enforcing agency has clarified that EMTALA applies to psychiatric emergencies, that many psychiatric evaluation areas qualify as dedicated EDs, and that psychiatric hospitals participating in Medicare are obligated to accept appropriate transfers of patients requiring specialized care for stabilization regardless of insurance status. Prior work evaluating EMTALA-related civil monetary penalties (CMPs) from 2002-2018 found that 1 in 5 involved psychiatric emergencies and that psychiatric emergencies were more costly and more often associated with failure to stabilize than non-psychiatric emergencies. This study provides a 5-year update to the prior study describing EMTALA-related CMPs involving psychiatric emergencies from 2019-2023.

Methods: Descriptions of all EMTALA-related CMPs from 2019 to 2023 were obtained from the Office of the Inspector General (OIG) and added to an existing database. That database was also updated with several newly identified CMPs from the original 2002 to 2018 study period. Cases related to psychiatric emergencies were identified by inclusion of key words in settlement summaries. Characteristics of CMPs involving psychiatric emergencies including date, amount, and nature of the allegation were described and compared between the updated (2019-2023) and prior (2002-2018) study periods using Pearson's chi-squared, Fischer's exact tests or t-tests.

Results: Between 2019-2023, 8 (40.0%) of 20 EMTALA-related CMP settlements involved psychiatric emergencies, compared with 48 (20.0%) of 240 identified from 2002-2018 ($p=0.04$). The average settlement for CMPs involving psychiatric emergencies in the current study period was $243,427 compared with $81,865 from the prior data ($p=0.04$). Among CMPs involving patients with psychiatric emergencies, the most commonly identified deficiencies in the current study period included failure to MSE in 6 (75.0%), stabilize in 4 (50.0%), arrange appropriate transfer in 2 (25.0%), and accept appropriate transfer in 2 (25.0%). Proportions of deficiency types did not differ significantly between study periods. Notably, the patient's insurance status or ability to pay was noted as a reason for care denial in 4 (50.0%) of 8 CMPs involving psychiatric emergencies in the current study period compared with 7 (15%) of 48 in the prior ($p=0.040$), including cases involving failure to MSE, stabilize, arrange appropriate outgoing transfer, and accept appropriate incoming transfers. CMPs involving patients with psychiatric emergencies occurred most commonly in CMS Region 4 (AL, FL, GA, KY, MS, NC, SC, TN), including 5 (62.5%) CMPs in the current study period and 20 (41.7%) in the prior study period.

Conclusions: Psychiatric emergencies appear to be involved in an increasing proportion of EMTALA-related CMPs over the past 5 years, with a concerning and notable increase in the proportion of instances where insurance status or ability to pay was cited as a reason for care denial. A notable concentration of CMPs involving psychiatric emergencies was identified in CMS Region 4 in both study periods. Further investigation is warranted to determine whether this reflects regional differences in the provision of emergency care, reporting, or enforcement.

No, authors do not have interests to disclose

124 External Validation of Shah's Score for Emergency Department Patients Presenting With Psychiatric Chief Complaints

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Study Objective: To investigate the validity of the Shah score as a screening tool for the need for a workup for medical clearance for psychiatric patients.

Methods: A retrospective Electronic Medical Record (EMR) review was conducted at an urban teaching hospital with 147,496 emergency department (ED) visits per year. Inclusion: All adult patients presenting to the ED with a Psychiatric Chief Complaint (PSC) from May 1, 2022, to December 30, 2022, were assessed using Shah's score. PSC was defined as patients who complained only of psychiatric complaints and wanted to be evaluated by psychiatrists in the ED. Patients were excluded if they were pregnant, incarcerated, or had incomplete EMR. Requiring no medical evaluation was defined as those with stable vital signs, no physical complaints such as pain or injury, prior psychiatric history, and being fully oriented, while the presence of any one of these parameters was defined as needing a medical workup. Records were reviewed for the diagnosis and management of acute medical illness. Patient characteristics were reported as mean (%) and categorical data was analyzed by Pearson's $\chi 2$ using STAT statistical software (version 18.0; STATA Inc, College Station, Texas).

Results: A total of 1,613 patients were screened, and 507 patients met the entry criteria. The mean age was 39.1 ($\pm$14) years, 66.7% were males, 49.7% were African American, 18.2% were Hispanic, and 28.6% were white. Suicidality (49.9 %) was the predominant presenting complaint, and 55.03% were in the ED on a voluntary basis. Overall, 89.9% had labs performed. The ED dispositions were discharge (61.9%), psychiatric unit admission (35.5%), and medical admission (2.6%). The score identified 73% of the patients who did not require medical workup. Thirteen patients were admitted in this group. The diagnoses were acute kidney injury, acute coronary syndrome, thyroid cancer, the need for anticoagulation, and urosepsis. 79 patients required ED interventions, including intravenous fluids (48%), electrolyte repletion (17.2%), and antibiotics (15.2%). The score has a Negative Predictive value (NPV) for discharge disposition and no medicine admission of 98.8 % (CI 95% 96.50%-99.40%). Positive Predictive Value (PPV) 5.11% (CI 95% 2.08%-10.24%).

Conclusion: In our retrospective cohort, the Shah score showed a high NPV of 98.8%. The score is good at identifying psychiatric patients who didn't require a medical workup. However, it was not as effective at identifying patients who truly needed the medical workup.

No, authors do not have interests to disclose

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125 Buprenorphine or Methadone: A Qualitative Analysis of Patient Preference in an Urban Emergency Department

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Study Objective: To evaluate if patients with opioid use disorder (OUD) presenting to an urban emergency department (ED) which serves predominantly underrepresented and impoverished communities prefer treatment for OUD with methadone or buprenorphine and if misconceptions about medications for opioid use disorder (MOUD) are associated with their preference.

Methods: The design of this study is a qualitative analysis utilizing a Likert Scale and multiple-choice questions. A structured survey was used to analyze patient preference for MOUD. The survey included eight questions regarding attitudes and beliefs about buprenorphine and methadone on a 5-item Likert scale. A Likert-scale score of 1 corresponded to "strongly disagree," and a score of 5 corresponded to "strongly agree." Questions investigating barriers to buprenorphine initiation and self-reported demographics were also included in the survey as multiple-choice questions. Participants were offered an English or Spanish survey. Kruskal-Wallis and Mann-Whitney tests were used to analyze the Likert scale scores. Patients were consecutively enrolled at a single urban academic ED. The study included English and Spanish speaking patients over the age of 18 that met DSM-V criteria for OUD with decisional capacity. Pregnant patients and patients accompanied by police were excluded.

Results: The survey was completed by 150 participants with a participation rate of 89% (150/168). For self-identified demographics: 60% of participants identified as Hispanic (90/150), over 10% (16/150) were Spanish speaking only, 82% reported unemployment (123/150), 65% reported unstable housing (97/150) and 91% reported an annual income less than $20,000 (137/150). More participants reported active treatment with methadone (68/150) than buprenorphine (25/150). A majority of participants reported hearing that buprenorphine causes withdrawal (67% (100/150)) and 45% (68/150) reported experiencing withdrawal from buprenorphine. Overall, participants more strongly agreed that methadone relieved opioid withdrawal and cravings than buprenorphine, 4.0 +/- 1.09 and 3.15 +/- 1.24 ($p<.001$), respectively. Participants also more strongly agreed that they liked how methadone made them feel versus buprenorphine, 3.68 +/-1.17 and 2.73 +/- 1.19 ($p<.001$), respectively. Results from post hoc comparisons using Mann-Whitney tests for unrelated groups that were deemed significantly different by Kruskal-Wallis testing are shown in the table.

Conclusion: This qualitative study found that patients with OUD at a single urban academic ED tend to prefer treatment for OUD with methadone. Most participants had heard that buprenorphine causes withdrawal and almost half reported experiencing withdrawal after taking buprenorphine. As such, it is possible that prior experiences or misconceptions are leading patients to be averse to treatment of OUD with buprenorphine. These qualitative results suggest that further research is needed to elucidate how we can continue improving treatment of OUD in patients from underserved communities.

	Comparison by self-reported current MOUD		
Likert-scale question	**No MOUD vs currently using buprenorphine**	**Currently using methadone vs currently using buprenorphine**	**No MOUD vs currently using methadone**
Methadone blocks my cravings and reduces my symptoms of withdrawal	4.033 +/- .99 vs 3.32 +/- 1.13 ($p = .005$)	4.19 +/- 1.09 vs 3.32 +/- 1.13 ($p = <.001$)	4.033 +/- .99 vs 4.19 +/- 1.09 ($p = .162$)
Buprenorphine blocks my cravings and reduces my symptoms of withdrawal	3.05 +/- 1.37 vs 4.05 +/- 1.00 ($p = .003$)	2.97 +/- 1.10 vs 4.05 +/- 1.00 ($p = <.001$)	3.05 +/- 1.37 vs 2.97 +/- 1.10 ($p = .706$)
I like how methadone makes me feel	3.79 +/- 1.16 vs 2.68 +/- 1.17 ($p = <.001$)	3.91 +/- 1.03 vs 2.68 +/- 1.17 ($p = <.001$)	3.79 +/- 1.16 vs 3.91 +/- 1.03 ($p = .684$)
I like how buprenorphine makes me feel	2.52 +/- 1.19 vs 3.73 +/- 1.08 ($p = <.001$)	2.60 +/- 1.08 vs 3.73 +/- 1.08 ($p = <.001$)	2.52 +/- 1.19 vs 2.60 +/- 1.08 ($p = .681$)
Buprenorphine does not work	2.81 +/- 1.21 vs 1.73 +/- .700 ($p = <.001$)	2.82 +/- 1.15 vs 1.73 +/- .700 ($p = <.001$)	2.81 +/- 1.21 vs 2.82 +/- 1.15 ($p = .957$)
I have enjoyed my experience with my methadone clinic	3.57 +/- 1.10 vs 2.86 +/- 1.11 ($p = .010$)	3.78 +/- 1.16 vs 2.86 +/- 1.11 ($p = <.001$)	3.57 +/- 1.10 vs 3.78 +/- 1.16 ($p = .153$)
I would like to have a 30-day supply of methadone rather than visiting a clinic daily	3.78 +/- 1.30 vs 3.24 +/- 1.14 ($p = .052$)	4.28 +/- 1.03 vs 3.24 +/- 1.14 ($p = <.001$)	3.78 +/- 1.30 vs 4.28 +/- 1.03 ($p = .023$)

No, authors do not have interests to disclose

126 Reasons for Declining Buprenorphine Induction Among Persons With Opioid Use Disorder Presenting to the Emergency Department

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Study Objectives: Buprenorphine induction in the emergency department (ED) has been shown to double retention in treatment at 30 days (Donofrio et al, 2015). However, little is known about acceptance rates of ED-initiated buprenorphine (EDIB) and reasons why patients decline this life-saving intervention. The aim of this study was to quantify the number of patients who decide to initiate and decline buprenorphine in the ED and determine rational for declination.

Methods: Seven EDs implemented EDIB programs in South Carolina between 2017 and 2023. Each EDIB program included ED-based peer recovery specialists (PRSs) to perform screening for opioid use disorder (OUD), provide a brief intervention, and assist with referral to outpatient treatment. The PRSs recorded patient interactions in a database including medical eligibility for medication for opioid use disorder (MOUD), if EDIB was provided, and the reason(s) why eligible patients declined EDIB. Medical eligibility was determined by an emergency physician (EP). Medical eligibility included EP determination of the patient meeting OUD diagnostic criteria any patient-specific medical contraindications to buprenorphine. All eligible EDIB patients from January 1, 2020 to September 30, 2023 were entered in the PRS database and included in the study. Reasons for declining buprenorphine in eligible patients were analyzed. PRSs had the option of selecting reason for declination from a prepopulated list of fixed responses and/or entering a free-text response. Possible fixed responses were: not ready for treatment, prefers non-MOUD program, and in a MOUD program already. Free-text responses were reviewed by three attending physicians (1 EP and 2 addiction psychiatrists) and a code book was iteratively developed. First, all free-text responses were reviewed independently by 2 reviewers. Any discrepancies between the first 2 reviewers were analyzed by the senior reviewer who made the final determination. More than one reason for buprenorphine declination per patient encounter was permitted. Descriptive statistics were used to describe results.

Results: A total of 2,161 patients were eligible for EDIB. Of those, 963 (44.6%) patients accepted buprenorphine and 1,198 (55.4%) declined. For encounters where the patient declined, 613 had discrete field responses (51.2%), 252 had free text responses (21.0%), 332 had both free text and fixed responses (27.7%), and 1 had no reason for declination entered (0.1%). The most common reason for declination was the "patient preferring non-MOUD treatment" (56.0%) followed by "not ready/would like to think about it and/or discuss with other treatment providers" (16.8%).

Conclusions: In our cohort, there was limited uptake of EDIB amongst eligible patients with OUD. Further investigation into reasons patients decline EDIB or prefer non-MOUD treatment is warranted.

Reason for Declining EDIB	**N**	**Percentage**
Prefers non-MOUD treatment	671	56.0%
Not ready/pre-contemplative	201	16.8%
Patient denies being dependent, does not feel they have an OUD	105	8.8%
Prefers other form of MOUD (methadone, XR naltrexone)	61	5.1%
After care logistics	57	4.8%
Has tired buprenorphine in the past and doesn't want to again	34	2.8%
Reports issues around acute or chronic pain	33	2.8%
Psychiatric hospitalization	18	1.5%
Fear of needing to go through withdrawal to start buprenorphine	16	1.3%
Other	15	1.3%
Left AMA	14	1.2%
Reports one-time relapse or infrequent use	7	0.6%
Primary concern is lack of housing	5	0.4%
Medical hospitalization	4	0.3%

No, authors do not have interests to disclose

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127 Medications for Alcohol Use Disorder and Withdrawal: A National Sample of Patients Discharged From the Emergency Department

Hawk K, Weiner S, Rothenberg C, Sharma P, Shahid S, Sambell M, Goyal P, Venkatsh A/Yale University, New Haven, Connecticut, US

Background: Emergency physicians are well positioned to treat ambulatory alcohol withdrawal and initiate medications for alcohol use disorder (AUD). Medications such as naltrexone and acamprosate are FDA approved medications that assist with cravings and reduce drinking but are underutilized. Additionally, there has been growing interest in the use of gabapentin for the treatment of ambulatory alcohol withdrawal and cravings. To enhance dissemination of best practices in the care of emergency department (ED) patients with AUD and assess practices related to AUD care in U.S. EDs, we expanded the ACEP Emergency Medicine Quality Network (E-QUAL) Opioid Initiative to include AUD quality improvement (QI) through a curated toolkit with webinars and resources and a QI chart review to assess and benchmark ED care for patients with AUD.

Methods: In March of 2023, participating EDs were requested to complete a structured chart review of 30 randomly selected ED visits who were discharged from the ED between September 2022 - February 2023 (baseline) with ICD-10 codes for alcohol intoxication or withdrawal, and to report on the following measures: AUD treatment referral in the ED, benzodiazepine, phenobarbital, or MAUD (gabapentin, naltrexone, acamprosate, disulfiram, carbamazepine, or valproic acid) administration in the ED or prescription at discharge. In November 2023, EDs were requested to review and submit metrics from an additional 30 charts for visits between July 2023 - October 2023 (follow-up). Descriptive statistics were used to evaluate combined data.

Results: Among the 153 EDs who provided data for at least 10 charts during both time periods, 73 (48%) reported <20K annual visits, 75 (49%) reported 20K-60K annual visits and 3 (2%) reported >60K annual visits. 71 EDs (47%) were rural and 17 (11%) were critical access EDs. Among 5,822 ED visits reported in both periods, 4,941 (84.9%) included a referral to AUD treatment. MAUD was administered in 1,348 of 5,994 (22.5%) of ED visits, with benzodiazepines being most commonly administered (1,294/1,348; 96%) followed by phenobarbital (43/1,348; 3.2%). Upon discharge, MAUD was prescribed in 599 of 5,965 (10%) visits. Of those visits that resulted in a prescribed medication, benzodiazepines were the most commonly prescribed medication (568/599; 94.8%) followed by gabapentin (18/599; 3.0%) and naltrexone (13/599; 2.2%)

Conclusion: EDs participating in a national practice-based learning network report a high level of AUD treatment referrals and most often utilize benzodiazepines in the treatment of ED patients with alcohol-related presentations. Opportunities to increase the provision of evidence-based MAUD medications, including naltrexone and gabapentin, are significant.

	Total Numerator	% Among Those Receiving Medication	Total # ED Visits	% of Total ED visits
Medication Administered				
Any medication	1348		5994	22.5%
Benzodiazepines	1294	96.0%	5994	21.6%
Phenobarbital	43	3.2%	5994	0.7%
Gabapentin	11	0.8%	5994	0.2%
Naltrexone	7	0.5%	5994	0.1%
Acamprosate	0	0.0%	5994	0%
Disulfiram	1	0.1%	5994	0%
Carbamazepine	0	0.00%	5994	0%
Valproic acid	4	0.3%	5994	0.1%
Medications Prescribed at Discharge				
Any medication	599		5965	10.0%
Benzodiazepines	568	94.8%	5965	9.5%
Phenobarbital	1	0.2%	5965	0%
Gabapentin	18	3.0%	5965	0.3%
Naltrexone	13	2.2%	5965	0.2%
Acamprosate	0	0.0%	5965	0%
Disulfiram	2	0.3%	5965	0%
carbamazepine	0	0.0%	5965	0%
Valproic acid	3	0.5%	5965	0.1%

No, authors do not have interests to disclose

128 Emergency Department Initiation of Buprenorphine/Naloxone to Reduce Opioid Overdose and Death

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Study Objectives: The opioid epidemic continues to escalate, emphasizing the need for effective treatment strategies for opioid use disorder (OUD). The emergency department (ED) presents a valuable opportunity to initiate addiction treatment services. The purpose of this study is to investigate the efficacy of ED-prescribed buprenorphine in the reduction of subsequent overdose and mortality across various patient groups.

Methods: We used a large, national electronic health record database (Cosmos, Epic Systems, Verona WI) to identify patients presenting to the ED with OUD or overdose between May 2019 and May 2023. Patients were identified as having received buprenorphine/naloxone, naloxone, both, or neither, and were subdivided by age, race, legal sex, ethnicity, socioeconomic status (determined by the social vulnerability index), region, and prior high-risk characteristics. The efficacy of buprenorphine was evaluated in the different population subgroups, with the primary outcome being subsequent overdose within 90 days from the ED encounter. The secondary outcomes were subsequent overdose within 180 days and mortality within 90 and 180 days.

Results: Of the 293,474 patients presenting to the ED with OUD or overdose in the study period, 19,728 (6.7%) received a prescription for buprenorphine with prescribing rate variation between racial and ethnic groups, legal sex, and SVI. For recipients of buprenorphine, the risk of subsequent overdose at 90 days was reduced by 40% at 90 days ($p<.05$). The risk of death was reduced by 69% at 90 days ($p<.05$). There was a significantly larger reduction in subsequent overdose rate in younger patients compared to older patients, and among White patients compared to other races. No significant differences in 90-day mortality risk reduction were observed between patient groups. Patients who received naloxone during the ED visit and those who did not both benefited from the administration of buprenorphine.

Conclusions: In this large, nationally representative study, ED-prescribed buprenorphine was associated with significant reductions in subsequent overdose and death rates across patient demographics. Disparities in buprenorphine efficacy and prescribing practices were identified, highlighting the need for future research to improve addiction management strategies for patients with OUD.

No, authors do not have interests to disclose

129 Methamphetamine Use and Engagement With Medications for Opioid Use Disorder

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Study Objectives: The number of opioid overdose deaths involving stimulants have more than quadrupled since 2015. In primary care, patients with opioid use disorder (OUD) who also use methamphetamine (meth) are less likely to be retained in treatment with OUD compared to people with OUD who do not also use meth. Less is understood about how meth impacts MOUD initiation and retention in the ED setting. The current analysis was conducted to assess the association between methamphetamine use and medications for opioid use disorder (MOUD) among emergency department patients with moderate to severe OUD. We hypothesized that individuals who use meth would be less likely to be on MOUD at the time of ED visit compared to non-users of meth.

Methods: Patients in the Harborview Medical Center ED were approached to participate in the ED-LINC trial from 4/2022 to 3/2024 trial by trained RAs. Eligible participants were receiving care in the ED or inpatient area, had a diagnosis of OUD and were currently using opioids. Patients were excluded if they did not speak English, were having a psychiatric emergency, were in police custody or did not have a method of contact such as a cell phone. After providing informed consent, participants completed a baseline survey assessing demographics including housing status, substance use behaviors, physical health, mental health, and other items. A secondary analysis was performed on baseline data of the trial and an unadjusted logistic regression was performed to determine an odds ratio between meth use and MOUD status at the time of ED visit.

Results: 226 participants were included in this analysis. The average age was 42.1 years (SD 11.68 years), 73.01% were male, 13.27% were Black or African American, and 63.72% were White. Additionally, 26.11% reported being homeless and 17.26% reported living in a shelter or other temporary residence. The majority (85.8%) reported using fentanyl in the 30 days prior to their ED visit, and 81% of those who

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used fentanyl reported 5 or more uses per day. With regards to meth, those that used meth 15-30 days out of the past 30 had 52% lower odds of being engaged on MOUD treatment at the time of their ED visit than those who did not use methamphetamine (OR=0.48, 95% CI: 0.23, 0.98).

Conclusion: Overall, individuals in the ED with moderate or severe OUD who also use methamphetamine 15 or more days per month have significantly lower odds of being on MOUDs at the time of their ED visit compared to those who did not use methamphetamine at all. The widespread concurrent use of methamphetamine and opioids may affect treatment and engagement with MOUDs, and further research is needed to elucidate the nuances of this relationship. While more research is required to uncover the causal inputs of this association, our research suggests that Emergency clinicians should pay special attention to methamphetamine use as an indicator of opportunity to discuss and initiate MOUDs for patients with OUD, as well as provide overdose prevention and other harm reduction resources.

Table 1. Frequency of Meth Use and MOUD Status at ED Visit (N=226)

	Positive MOUD Status	Negative MOUD Status	Total	Odds Ratio (95% CI)
No Meth Use	21	25	46	Reference
1-14 Days/Month	31	41	72	0.90 (0.42, 1.89)
15-30 Days/Month	31	77	108	0.48 (0.23, 0.98)

Yes, authors have interests to disclose
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Grant Support
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130 Incentivizing Substance Use Disorder Treatment in Emergency Departments: A Competition-Based Approach Harnessing Electronic Health Record Data

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Study Objectives: The objective of this study was to address the vital need for increased provision of substance use disorder (SUD) treatments in the emergency department, recognizing their significant impact on long-term patient outcomes. Specifically, we aimed to determine whether a competitive approach using electronic health record (EHR) data further increased the delivery of these crucial services within an already effective system offering substance use resources.

Methods: Our intervention was implemented across two major county emergency medicine residency programs operating within the same health system, each during distinct, non-overlapping time periods to ensure independence. Weekly EHR (Cerner) queries were conducted to identify pre-determined SUD-related actions by resident providers. These interventions included administration or prescriptions written for buprenorphine or naloxone and consultations to the addiction medicine team. Residents received one point for each treated SUD case in which they were involved. The point totals were regularly disseminated through resident conferences and email communications, incorporating a competitive element known as the "X-Waiver Games" at site one. Rewards, such as gift cards, were provided to weekly high scorers, while residency classes competed collectively for a prize at the intervention's culmination. At site two, out of concern that emphasis on gamification could trivialize substance use care, the intervention was referred to as "Substance Use Care Incentivization" and emphasized themes of recognition and excellence rather than competition. Importantly, all providers involved in patient encounters received recognition, promoting inclusivity and collaboration. The primary outcome measure was the number of patients for which SUD treatments were ordered each day at site one over a three-month period compared to the preceding three months, with a two-week washout period at the intervention's onset. Results were analyzed using a difference-in-differences Poisson model, utilizing site two as a contemporaneous control to account for unrelated health system changes. Additionally, a secondary analysis examined the intervention's combined impact on both sites. Furthermore, the sustainability of the effect was evaluated through a three-month follow-up sample starting three months after the intervention concluded.

Results: A total of 107 residents were included in the competition across the two sites. In the baseline period at site one, an average of 3.4 patients per day received SUD treatments, which notably increased to 4.5 during the intervention phase. Statistical analysis using a Poisson model with site two as a contemporaneous control for which the intervention had not yet been implemented revealed a highly significant effect ($P < 0.01$). Moreover, a secondary analysis demonstrated a comparable magnitude of effect at site two, with daily cases rising from 9.8 to 12.0. Notably, the observed increase in SUD treatments persisted in a sample taken three months post-intervention, indicating the sustained impact of our approach.

Conclusion: Our intervention demonstrated a sustainable and impactful approach to increasing SUD treatment provision in the emergency department. We achieved a significant rise in daily SUD treatment cases, showcasing the intervention's effectiveness and durability. Moreover, the enjoyable and competitive nature of the intervention ensured sustained engagement, making it a viable and lasting strategy for improving patient care. Discussion surrounding our intervention highlighted the concern that incentive programs could trivialize patient care or lead to non-indicated care. Importantly, our intervention was effective in a network already providing quality SUD care. Its ease of implementation, coupled with its compounding effect on current systems, makes it a replicable model for addressing complex healthcare challenges. Future research should focus on further refining and applying this approach to other behavioral-modification efforts.

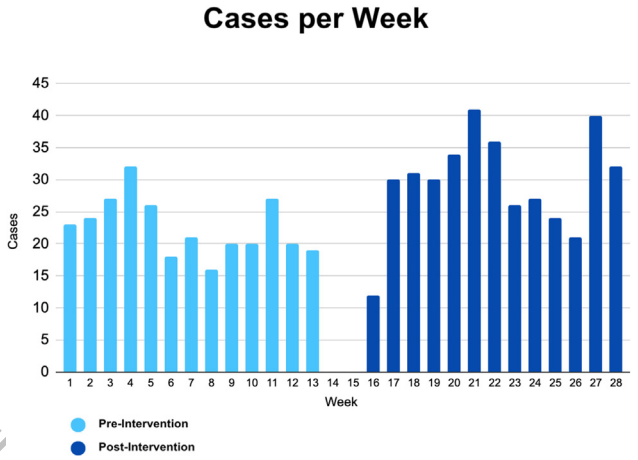

Figure 1. Frequency of Substance Use Disorder Provision Cases per Given Week at Site 1, Prior to and During Intervention. Washout period observed over weeks 14 and 15.

No, authors do not have interests to disclose

131 Pulmonary Embolism Severity Index vs Point-of-Care Ultrasound in Predicting Adverse Outcomes

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Study Objectives: Emergency physicians risk stratify patients with pulmonary embolism (PE) to determine disposition. The pulmonary embolism severity index (PESI) is a validated prediction tool for mortality based on clinical parameters. Point-of-care ultrasound (POCUS) can assess for signs of right ventricular dysfunction (RVD). Our primary objective was to evaluate the accuracy of POCUS in predicting short-term clinical outcomes in patients with acute PE compared to PESI.

Methods: We conducted a prospective, multi-center, observational study of adult emergency department (ED) patients with acute PE diagnosed by computed tomography. Each subject had a PESI score calculated and underwent POCUS to assess for RVD. Subjects received standard treatment and were followed via chart review and telephone calls at 7 and 30 days. The primary outcome was a composite of death, major bleeding, subsequent hospitalization, and need for cardiovascular or respiratory interventions within 5 days. Secondary outcomes included the composite outcome at 30 days and mortality at 5 and 30 days. Sensitivity, specificity, and likelihood ratios (LR) were calculated for PESI and POCUS, both separately and in combination.

Results: We enrolled 142 patients across three sites. Patients were 47.9% female with a mean age of 63.8 years (SD 16.1, range 20-99). Mortality in the first 5 days was 2.8% with a composite outcome incidence of 16.9%. In predicting the primary composite outcome at 5 days, PESI score >2 demonstrated a sensitivity of 0.71 [95%

CI, 0.49-0.87], specificity of 0.36 [0.28-0.46], +LR 1.1 [0.8-1.5] and -LR 0.8 [0.4-1.6]. POCUS with gross RVD demonstrated a sensitivity of 0.75 [0.53-0.90], specificity of 0.58 [0.48-0.67], +LR 1.8 [1.3-2.4] and -LR 0.4 [0.2-0.9]. PESI >2 and POCUS in combination yielded a sensitivity of 0.92 [0.73-0.99], specificity of 0.28 [0.20-0.37], +LR of 1.3 [1.1-1.5] and -LR of 0.3 [0.1-1.2]. For the prediction of mortality at 5 days, PESI score >2 yielded a sensitivity of 0.75 [0.19-0.99], specificity of 0.36 [0.28-0.44], +LR 1.2 [0.7-2.1] and -LR 0.87[0.1-3.9]. POCUS with gross RVD predicted 5 day mortality with a sensitivity of 1.00 [0.40-1.0], specificity of 0.54 [0.45-0.62], +LR 2.2 [1.8-2.6] and -LR 0.0. PESI >2 and POCUS in combination yielded a sensitivity of 1.0 [0.40-1.0], specificity of 0.25 [0.18-0.33], +LR of 1.3 [1.2-1.5] and -LR of 0.0.

Conclusion: POCUS outperformed PESI in predicting adverse outcomes for ED patients with PE at 5 days. The combination of POCUS and PESI yielded improved sensitivity, but with reduced specificity.

No, authors do not have interests to disclose

132 Erector Spinae Block Used for Patients With Renal Colic in the Emergency Department: A Randomized Clinical Trial

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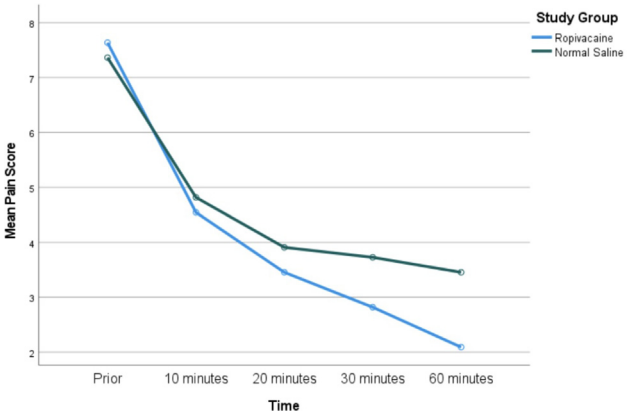
Background and Study Objectives: Kidney stones affect approximately 1 in 11 people in the United States. With the persistent opiate epidemic in the United States, with high morbidity and mortality, there is a growing push to achieve analgesia for renal colic, as well as other complaints, using a multi-modal approach. There have been several studies already discussing the potential for regional anesthesia, specifically the Erector Spinae Plane Block (ESPB) for treatment of renal colic. The main objective was to determine if an Erector Spinae plane block for patients with renal colic in addition to standard of care improves pain scores. Our secondary objectives were comparing difference between both Anesthetic and Normal Saline injections in regard to pain scores, time to disposition, total number of rescue medications needed, particularly opiate medications compared to matched controls who did not receive the block. Lastly, we evaluated the 30-day outcomes for necessity for surgical intervention.

Methods: We performed a prospective, randomized, single-center, convenience sample of adult patients ≥18 years old presenting to a large suburban, academic ED with renal colic with confirmatory imaging study of a stone. ESPB were performed at the T7-T8 region with injection of either 20mL of 0.5% Ropivacaine or Normal Saline. Patients were monitored on telemetry for potential side effects. Questionnaires were obtained that assessed patient's pain pre- and at intervals of time including 0, 10-, 20-, 30-, and 60-minutes post block. Satisfaction scores on a Likert Scale were obtained as well, with commentary allowed. Thirty-day follow-up performed by chart review, or by phone if necessary.

Results: Forty-four patients were used in the analysis. Of the 22 ESPB subjects, 11 were randomized into each arm with comparison to 22 matched controls. Subjects mean age was 47 with 39% females, 9% Hispanic, and 50% having prior history of stones. The mean (SD) pain score prior to ESPB was 7.50 (2.3) and at 60 minutes was 2.8 (2.7). Using a paired sample t-test the difference was a 4.7 (95% CI 3.4-6.0) decrease in pain from prior to 60 minutes with a p value of <.001. Mean time to ESPB was 283 (218) minutes. Length of stay was shorter in the ESPB groups with 408 (142) minutes for Ropivacaine, 415 (138) minutes for saline arms respectively, compared to controls with 608 min (692). In addition, opiate requirement was less in Ropivacaine arm 1.0 (1.3) compared to opiates given in saline 1.72 (1.3) or controls 1.3 (1.3). No adverse outcomes were reported in any of ESPB. When looking at 30-day outcomes, 23% (5/22) subjects vs. 45% (10/22) control subjects required urologic intervention.

Conclusions: This pilot study demonstrates that ESP blocks performed in patients for renal colic are safe and did not have any adverse outcomes. There is a trend that pain scores are lower in the Ropivacaine group over time, and patients have shorter length of stay and are less likely to require intervention when compared to controls. The ESP block provides an effective alternative option to patients who have risk factors for opiate medications and works synergistically as a part of the multi-modal pain approach.



Yes, authors have interests to disclose
Disclosure: Bristol-Myers Squibb Co.
Lecturer/Speaker
Bristol-Myers Squibb Co.

133 Rising VExUS Score After Small Volume Fluid Resuscitation Is Associated With Worse Outcomes in Septic Emergency Department Patients

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Background: Intravenous fluid resuscitation is among the strongest recommendations for emergency department (ED) patients presenting with sepsis. The Venous Excess Ultrasound Grading System (VExUS) was created as an assessment tool for venous congestion using point-of-care ultrasound (POCUS). Although a VExUS score of zero suggests the absence of vascular congestion, changes in VExUS scores following fluid administration have not been previously investigated in this cohort. The objective of this study was to investigate whether increasing VExUS scores after a 500cc fluid challenge predicts worse outcomes for ED patients with sepsis. The association between adverse outcomes and cardiac contractility, fluid responsiveness, and right ventricular (RV) dysfunction were also investigated.

Methods: This prospective, cohort study enrolled a convenience sample of patients presenting with suspected sepsis to a single quaternary care ED. Patients were eligible if they screened positive for Sepsis on arrival. Patients were excluded if they were intubated, on vasopressors, or received more than 500cc of intravenous fluids prior to enrollment. The inferior venous cava (IVC) was measured by ED providers, and a VExUS of zero was defined by an IVC <2 cm. Ultrasounds were repeated following a 500cc fluid challenge to identify increasing VExUS scores. POCUS was performed to evaluate both left and right ventricular function and fluid responsiveness, which was defined as a greater than 10% rise in velocity time integral after fluid challenge. Chart reviews were performed to identify a primary composite outcome including ICU admission, rapid responsive team activation, or mortality within 24 hours of ED arrival. Logistic regression models adjusting for lactate levels, were used to assess the odds of the compositive outcome associated with changes in VExUS score.

Results: 538 patients were enrolled, of which 292 (54%) were found to have a VExUS score of zero in their initial evaluation. After adjusting for lactate and age, a VExUS score of zero which increased to greater than zero after a 500cc fluid challenge was associated with higher odds of the composite outcome (OR:3.36; 95% CI: 1.72, 6.48). 31 patients (10.9%) had systolic dysfunction on initial assessment. 45.2% (14/31) of patients with systolic dysfunction had increased VExUS scores after a fluid challenge, compared to 17.0% (43/253) in patients with preserved systolic function (p=0.0003). 92 patients (31.5%) had RV dysfunction, 33.7% of patients (31/92) with RV dysfunction had increased VExUS scores after a fluid challenge, compared to 15.0% in those with preserved RV function (p=<0.0001). Fluid responsiveness was not associated with a change in VExUS score (p=0.1275). In a multivariable logistic regression model adjusting for lactate, age, initial EF and RV function, patients with an increase in VExUS had 3.43 times the odds of having the composite outcome, which was statistically significant.

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Conclusion: This study is one of the first to evaluate increasing VExUS scores before and after a fluid challenge in septic ED patients. These results suggest an increased odds of adverse outcomes when VExUS scores increase after a 500cc fluid challenge. Additionally, the absence of fluid responsiveness was not associated with a change in VExUS score. However, patients who had reduced left ventricular systolic function and/or RV dysfunction with increasing VExUS scores after a fluid challenge experienced a higher rate of 24-hour adverse outcomes. Clinicians should be mindful of patients with an increasing initial VExUS score after a fluid challenge during ED resuscitations.

No, authors do not have interests to disclose

134 Emergency Department Admitting Service Triage Using Retrieval-Augmented Language Models

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Study Objectives: Navigating the admissions process for a patient requiring hospitalization represents a significant clerical burden on emergency physicians (EPs) and an operational bottleneck in the efficient flow of an emergency department (ED). For example, our institution has 8 adult cardiology services and 6 oncology services *across two hospital groups*, with a 32% admission rate and an annual ED census of ~100,000 patients. Delays arising from choosing the incorrect service and redundant phone calls account for thousands of lost bed-hours per year. Our current admissions process requires EPs to sift through diagnosis-specific policies via a mobile application, a task further complicated by numerous edge cases and exceptions. The increasing usage of large language models (LLMs) in supporting physician task brings forward the potential of retrieval-augmented generation (RAG) to streamline this process. RAG enhances the accuracy of responses and decreases hallucinations by retrieving and incorporating "ground truth" information from external sources, such as a hospital's admission guidelines. Our objective is to use a RAG-enabled method to reduce clerical burden in this low-risk, yet highly frustrating aspect of the ED admissions process.

Methods: We evaluated two publicly available LLMs, Anthropic's Claude 2 and OpenAI's GPT-4 (gpt-4-1106-preview), using RAG methodology. Two types of admissions policy documents were used for retrieval: a multi-departmental admissions agreement spreadsheet (CSV), and individual diagnosis-specific policies with flowcharts (PDF). We created 20 sample patient vignettes reflecting our ED's admissions scenarios. We computed embeddings for both the vignettes and each policy document, creating separate vector databases for retrieval. The models retrieved the top five matching documents based on these embeddings and were prompted to return the correct admitting service for each vignette. Outputs were independently graded by two EPs familiar with the admissions process, with discrepancies adjudicated by a third EP. Answers were scored on a scale of 1 point (accurate), 0.5 points (incorrect subspeciality but correct specialty), and 0 (inaccurate).

Results: The final scores for the four methods were Claude-PDF 12.5, GPT-PDF 12, Claude-CSV 16.5, and GPT-CSV 17. GPT-CSV was the most accurate, scoring 17 out of a maximum of 20 points. There was no appreciable difference between the model performance of Claude and GPT-4, but we achieved better performance using the multi-department admit agreement spreadsheet compared to condition-specific flowcharts.

Conclusions: In using RAG to increase accuracy, we were able to combine the in-context learning capabilities of modern LLMs with hospital admissions policies to generate respectable triage accuracy. Notably, we used pre-existing admissions resources without any modification, and other than using RAG methodology the models did not require additional costly fine-tuning. This pilot study highlights how a health system might adapt pre-existing physician resources to leverage generative artificial intelligence to assist in a low-risk, high-frustration task. Increasing "first-pass" admission service accuracy has important implications for both improving ED throughput as well as decreasing provider clerical burden. More work needs to be done to integrate such a tool into the admissions workflow and increase accuracy; we are currently experimenting with a multi-modal approach using an OpenAI vision model, as well as additional model fine-tuning to better fit the needs of our specific institution and patient population.

No, authors do not have interests to disclose

135 Improving Crowding and Patient Satisfaction in the Emergency Department Through Early Discharge Lounge Operation

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Study Objectives: Crowding in the emergency department (ED) affects patient safety by delaying treatment of critically ill patients, delaying resuscitation, and increasing mortality. It is important to facilitate the patient flow of emergency care in all three areas of the flow: input, throughput, and output. Output is the most important rate limiting factor, where the bottleneck phenomenon occurs. Once a decision has been made for the patient to be admitted or to be discharged, the process should focus on emptying that bed as earlier as possible. But for various reasons, unnecessary delays contribute to developing the bottleneck for the output process. Therefore, we developed an early discharge lounge in the ED and assessed the effectiveness of the system.

Methods: This study is a single-center research conducted at the emergency department of a university hospital(tertiary hospital) designated as a regional emergency medical center, and it is a retrospective cohort study. The patient group enrolled in this study consisted of those admitted and discharged in August 2022, serving as the control group, and those admitted between September 2022 and August 2023 via the discharge lounge, serving as the experimental group, reflecting the application period of the discharge lounge system. Patients discharged from zones where the discharge lounge was not operational were excluded.

Results: From September 2022 to August 2023, a total of 7,486 patients who visited the emergency department of a university hospital designated as a regional emergency medical center utilized the discharge lounge. Compared to August 2022, when the discharge lounge was not operational and 31.6% of patients experienced a delay of over 30 minutes until discharge, the proportion significantly decreased to an average of 4.6% over the year following the introduction of the discharge lounge in September. From September 2021 to August 2023, among patients who visited the emergency department, the proportion of patients experiencing a delay of more than 30 minutes from the time of discharge prescription to actual discharge decreased, with a statistically significant difference (p-value = 0.0056). Before the introduction of the discharge lounge in August 2022, the median length of stay was approximately 56 minutes, which dramatically decreased to a maximum of 46 minutes over the year following the introduction, with an average of 14.75 minutes. The time taken for bed cleaning in August 2022 was 38 minutes, but after the introduction of the discharge lounge, it decreased by a maximum of 29 minutes over the year, with an average remaining in the 12-minute range. Patient satisfaction (out of 100 points) increased from 71.6 to 81.9 points, compared to the previous month without discharge lounge implementation. Faculty and staff satisfaction showed 78.6% and 90% for the emergency physicians and emergency nurses, respectively.

Conclusions: This study has demonstrated that the introduction of a dedicated discharge lounge in the emergency department can improve patient flow in overcrowded situations. Considering the result that 95% of patients using the discharge lounge expressed a desire to use it again, expanding the operation of the discharge lounge from the current daytime (11:00 am to 7:00 pm) to nighttime should be considered. Additionally, dedicated staff managing the discharge lounge should monitor unnecessary delays in patient treatment and ensure smooth flow. If leadership can visualize the discharge lounge as a system for the entire hospital, building a command system, it will further enhance the operational efficiency of the discharge lounge.

No, authors do not have interests to disclose

136 Creating a Virtual Extension of the Academic Medical Center Through TelEmergency and Layered, Acute Service Consultations

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Background: Patients in rural areas have limited access to care and face worse outcomes for a variety of medical conditions when compared to urban counterparts. TelEmergency (TE) was developed to improve access to quality emergency care in rural areas by utilizing an innovative advanced practice providers and emergency physician spoke and hub model. While emergency physicians are trained to stabilize emergency conditions, other specialists are sometimes required to provide recommendations for definitive care. Layering consultation services onto the backbone of our established TE

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system could provide additional resources not available in rural communities and prevent unnecessary transfers.

Study Objectives: To create a virtual extension of a large, academic ED through layering acute service tele-consultations, tele-stroke, tele-psychiatry, and tele-toxicology, onto the backbone of our TE consultations.

Methods: Using our existing TE consultation process, the emergency physician in the hub ED evaluates the patient in the rural, spoke ED via audiovisual connection in typical fashion. For this proof of concept study, the emergency physician determines if an acute service consultation is required. If so, the tele-consultation occurs and the physician from the acute service offers recommendations. All TE patients are eligible. Primary outcome: transfer avoided as determined by emergency physician. Secondary outcomes: 30-day ED visits or hospital readmission and clinical outcomes measures as pre-determined by each specialty. Descriptive statistics, chi-squared, and Mann Whitney U tests used, as appropriate.

Results: A total of 88 acute service tele-consultations have occurred to date with 48 tele-stroke (56%), 21 tele-toxicology (24%), and 19 tele-psychiatry consultations (22%). In these cases, transfers were avoided in 8/48 (17%), 12/21 (57%), and 8/19 (42%) for tele-stroke, tele-toxicology, and tele-psychiatry, respectively, with a median transfer distance of 85 miles (IQR 55, 119). 30-day ED visits and hospital readmissions rates were 3/88 (3%) and 2/88 (2%), respectively.

Conclusion: Our initial results suggest layering acute service consultations onto the backbone of an existing tele-emergency systems has the potential to expand the services available to patients in rural area and limit unnecessary transfers. This could impact the sustainability of rural hospitals and potentially increase resource utilization from physicians in specialties which are limited in healthcare.

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137 Pediatric Telemedicine Care Is Associated With Minimal Increases in Subsequent Emergency Department Visits

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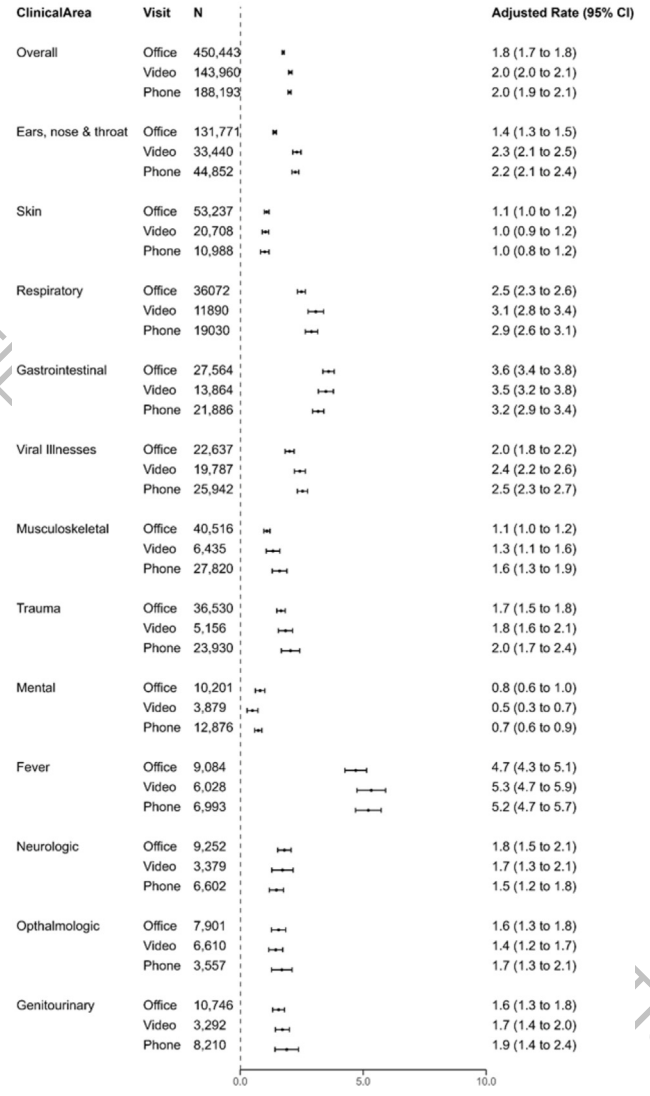
Study Objectives: Telemedicine is an increasingly used yet understudied vehicle to deliver pediatric primary care. Evidence comparing differences in downstream emergency department (ED) visits and hospitalizations following telemedicine visits compared with after in-person visits is needed. It is also important to understand if telemedicine has differential efficacy based on patients' areas of clinical concern as well as its effect on resource utilization. We compared in-person pediatric primary care visits with those that used telemedicine (video or telephone) with regards to downstream emergency department visits, hospitalizations and return in- person visits. We also compared resource utilization at the index visit for the three visit types.

Methods: This was an observational cohort study of pediatric primary care visits in a large integrated health care delivery system offering patient-selected in-person office visits, video visits, or telephone visits for pediatric primary care. We included all patients <18 years of age who had scheduled primary care appointments from January 1, 2022 – December 31, 2022. We determined rates of downstream healthcare utilization (emergency department visits, hospitalizations, in-person visits) within 7 days (including same day in-person visits) after the index telemedicine or office visit, adjusted for patient and clinical characteristics and also stratified our results by area of clinical concern. We also determined resource utilization (medication, laboratory, and imaging ordering) at the index visit for in-person visits compared with video or telephone visits.

Results: Of 782,596 total appointments among 438,638 patients (25% <2 years old, 49% female), telemedicine was used for 332,153 (42.4%) visits. After adjustment, more ED visits occurred 7 days after video visits (2.04%, adjusted difference 0.29%, 95% CI: 0.21% – 0.38%) or telephone visits (2.00%, adjusted difference 0.25%, 95% CI: 0.18% – 0.33%) compared with index in-person visits (1.75%) with negligible differences between 7-day hospitalizations. When stratified by area of clinical concern, otolaryngological concerns prompted the most subsequent ED visits after either a video or telephone visit. More in-person follow up visits occurred after an index video visits (14.4%, adjusted difference 10.1%, 95% CI: 9.9% – 10.3%) or telephone visits (15.1%, adjusted difference 10.8%, 95% CI: 10.7% – 11.0%) compared with index visits that were in-person (4.3%). After adjustment, there was more medication prescribing for in-person visits (39.8%) compared with video visits (29.5%, adjusted difference -10.3%, 95% CI: -10.56% – -10.0%) or telephone visits (27.3%, adjusted difference -12.5%, 95% CI: -12.5% – -12.7%). There was also more laboratory ordering for in-person visits (24.6%) compared with video visits (7.8%, adjusted difference -16.8%, 95% CI: -17.0% – -16.6%) or telephone visits (8.5%, adjusted difference -16.2%, 95% CI: -16.3% – -16.0%). Imaging ordering was higher for in-person visits (8.5%) compared with video visits (4.0%, adjusted difference -4.5%, 95% CI: -4.6% – -4.4%) and telephone visits (3.5%, adjusted difference -5.0%, 95% CI: -5.1% – -4.9%).

Conclusions: Telemedicine visits were followed by slightly higher rates of ED visits and moderately higher rates of in-person visits with no appreciable difference in hospitalizations. Otolaryngological concerns were associated with more subsequent ED visits after video or telephone visits compared with in-person visits. In-person visits were associated with more medication, laboratory, and imaging ordering compared with video or telephone visits. Telemedicine appears to be an effective vehicle for healthcare delivery in the pediatric population with minimal impact on downstream ED or hospital utilization but was associated with moderately higher subsequent in-person visits.

Figure 1: Adjusted percentage of 7-day return ED visits by index visit type.



No, authors do not have interests to disclose

138 The Efficacy of TeleTriage: Does It Matter Who Performs It?

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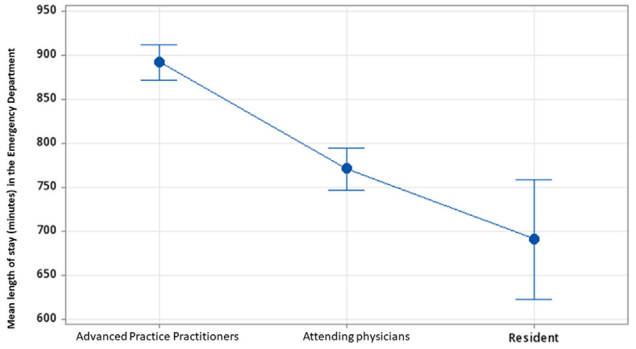
Study Objectives: Staffing shortages and increased demand in emergency departments (ED), among many other factors, often lead to longer wait times and lower patient satisfaction. This experience is especially true in the State of Maryland in 2023. In response to this phenomenon, many EDs have adopted the novel model of a telemedicine clinician triage system (TeleTriage) of remote clinicians performing screening exams on patients physically present in the ED in an attempt to decrease ED wait times and overall length of stay. The TeleTriage system has yet to be evaluated thoroughly. Our study aims to assess the efficacy of TeleTriage when performed by different types of clinicians.

Methods: This is a retrospective, observational analysis of data obtained from the emergency departments (ED) at two tertiary care centers of the University of Maryland Medical System. Patients who were treated during the calendar year of 2023 were eligible. The TeleTriage team is staffed via a moonlighting model with either Advanced Practice Practitioners (APP), Emergency Attending Physicians or Emergency Resident Physicians who work from home or in a central telemedicine hub in 3 shifts similar to ED shifts, with a maximum coverage of 14 out of 24 hours per day. Using telemedicine equipment in each triage room, TeleTriage clinicians remotely screen as many patients as possible across multiple EDs with the assistance of the in-person triage nurse at the time of initial patient triage assessment after ED arrival. Patients are semi-randomly selected to be evaluated by TeleTriage clinicians, with selection dependent on multiple factors including patient volume, number of simultaneous triages occurring at any given time, triage nurse evaluation of need for escalation, and TeleTriage clinician availability. TeleTriage clinicians stratify the risk and acuity of each patient, document findings, order tests, and either refer to continue in-person care or discharge patients directly from the waiting room. Primary outcome was ED length of stay (ED LOS). A one-way ANOVA and Tukey's Honestly Significant Difference (HSD) for multiple comparisons were used to compare ED LOS between patients being TeleTriage evaluated by attending physicians, resident physicians and advanced practice practitioners (APP).

Results: We identified 11,083 patients, of whom 4,380 (39.5%) were TeleTriage evaluated by attending physicians, 546 (4.9%) were TeleTriage evaluated by resident physicians, and 6,157 (55.6%) were TeleTriage evaluated by APPs. Mean (+/- SD) age of the population was 45 (19) years, and 6,128 (55%) were male. Emergency Severity Index (ESI) level 3 was most common (8,402, 76%). Most cases occurred during Monday-Friday (9,587, 86%) and between 7am-3pm (5,979, 54%). The mean ED LOS for all patients undergoing TeleTriage was 834 (+/- 810) minutes. Tukey's HSD Test for multiple comparisons found that the mean value of ED LOS for patients TeleTriaged by APP (891 +/- 845 minutes) was significantly different compared to patients triaged by attending physicians (770 +/- 767 minutes, $p<0.001$, difference -121 minutes, 95% C.I. = [-158.7, -84.0]), and patients triaged by resident physicians (690 +/- 665, $p<0.001$, difference -165 minutes, 95% C.I. = [-285.8, -117.0]). There was no statistically significant difference in mean ED LOS between patients triaged by attending and resident physicians ($p=0.074$).

Conclusion: Patients who were TeleTriaged by APPs in the ED were associated with higher ED LOS when compared to those being TeleTriaged by Emergency attending or resident physicians. Further studies are needed to confirm our observation and to investigate any underlying causes and patient outcome.



No, authors do not have interests to disclose

EMF 139 Assessing Efficacy and Value of Tele-Emergency Care Within the Veterans Health Administration

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Study Objectives: Tele-emergency care (TEC), a novel care model piloted in the Veterans Health Administration (VA), seeks to address Veterans' acute unscheduled care concerns more efficiently through virtual visits. With TEC, callers to the nurse advice line who have an acute concern identified are offered a visit by phone or video with an emergency physician or advanced practice provider (APP) with the goal of improving Veterans' access care while reducing low-value emergency department (ED) visits. Prior evaluation of a TEC pilot site demonstrated that TEC resolved 57% of Veteran concerns virtually while decreasing downstream ED utilization within 7 days of the nurse advice call from 35% to 18%, including decreased community care spending. However, as the program expands to more sites, a broader, more nuanced evaluation of TEC is needed. The objectives of this study were to evaluate the effectiveness of TEC use, modality (video vs phone), and provider type (physician vs advanced practice provider (APP)) on patient health-related outcomes across multiple VA sites.

Methods: This was a retrospective analysis of calls to the VA nurse advice line before and after TEC implementation. Patient demographic, comorbidity, care utilization, and mortality data were obtained from the VA Corporate Data Warehouse (CDW). Veterans Integrated Services Networks (VISNs) were surveyed about their TEC start date and staffing models. The study population included Veteran calls to the nurse advice line between January 2018 and October 2023 who were given a recommended follow-up interval (RFI) of 0-2 (ED now) or 2-8 hours (same-day). TEC encounters, call modality, and provider type were identified using structured data fields from the CDW. Augmented inverse-probability weighting was used to predict TEC receipt and compare outcomes by modality and provider type. A heterogeneous difference-in-differences model was used to compare outcomes at VA facilities that did and did not implement TEC during the study period. Primary outcomes included overall ED (VA and non-VA) utilization with 7 days, hospitalization within 7 days, and 30-day mortality.

Results: By October 2023, 58 VA sites across 8 VISNs had implemented TEC. Of 6,589,855 total nurse triage calls, 30% led to a recommendation to seek ED care and 14% to get same-day care. Prior to TEC implementation, 50% of RFI 0-2 and 24% of RFI 2-8 calls resulted in an ED visit within 7 days. In sites that implemented TEC, 15% of eligible callers received TEC. Of 63,033 TEC visits matched to a nurse triage call, 36% were video-based and 65% were seen by a physician. Compared to similar callers advised to go to the ED now, callers who received TEC were predicted to be 19.0% less likely to visit the ED within 7 days (31.7% vs 50.7%). The average treatment effect (ATE) of TEC among callers with RFI 2-8 hours was -2.8% (see Table 1). Video visits, compared to phone visits, were associated with a small increase in ED utilization (ATE: 2.3%) among callers with RFI 0-2 and no effect among callers with RFI 2-8. When examining differences by TEC provider type, physicians saw 71% RFI 0-2 and 59% RFI 2-8 compared to 29% and 41% for APPs. In multivariable analysis, TEC provision by a physician was associated with 6.3% higher ED utilization, 0.1% higher mortality, and null effect on hospitalization. In facility-level DiD analysis, TEC implementation decreased ED utilization by 2.1% among RFI 0-2 callers and had no effect among RFI 2-8 callers.

Conclusion: For patients recommended to follow up within 2 hours and who receive TEC, there is a dramatic decrease in ED visits. However, a much smaller effect was seen at the facility level, likely due to the relatively low rate of TEC receipt among eligible patients. Increasing TEC referrals among eligible callers may increase the overall effect size observed. Surprisingly, video and phone TEC modalities were associated with similar rates of downstream ED utilization. The higher rates of ED utilization following a physician-led (vs APP-led) TEC encounter may reflect a sorting effect, wherein physicians may manage more acute cases than APPs.

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Table 1: Average treatment effect (ATE) of tele-emergency care receipt, modality, and provider type on downstream care utilization and mortality

Treatment group	7-day ED utilization % (95%CI)	7-day Hospitalization % (95%CI)	30-day mortality % (95%CI)
TEC vs no TEC overall	-13.5 (-16.2 to -10.8)	-1.8 (-2.2 to -1.3)	-0.1 (-0.2 to -0.1)
RFI 0-2	-19.0 (-21.8 to -16.2)	-2.6 (-3.2 to -2.0)	-0.2 (-0.2 to -0.1)
RFI 2-8	-2.8 (-5.5 to -0.2)	-0.1 (-0.4 to 0.2)	-0.0 (-0.1 to 0.0)
Video vs phone TEC overall	1.1 (-0.0 to 2.3)	0.2 (-0.2 to 0.6)	0.1 (0.0 to 0.2)
RFI 0-2	2.3 (0.4 to 4.3)	0.4 (-0.3 to 1.1)	0.1 (-0.0 to 0.3)
RFI 2-8	-0.2 (-1.3 to 0.8)	0.0 (-0.3 to 0.3)	0.1 (-0.0 to 0.1)
APP vs physician overall	-6.3 (-9.5 to -3.1)	-0.4 (-0.9 to 0.2)	-0.1 (-0.2 to -0.0)
RFI 0-2	-5.9 (-9.4 to -2.4)	-0.4 (-1.2 to 0.4)	-
RFI 2-8	-7.0 (-10.7 to -3.2)	-0.4 (-0.9 to 0.1)	-0.0 (-0.2 to 0.1)

No, authors do not have interests to disclose

140 Enhancing Emergency Department Psychiatric Patient Care Through Telehealth: A Two-Site Pilot Study

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Study Objectives: This pilot project explores a novel telehealth intervention designed to reduce length of stay (LOS) and address the lack of treatment of patients presenting to the emergency department (ED) with psychiatric complaints by leveraging a partnership between emergency medicine and tele-behavioral health with a focus on early active treatment to de-escalate and discharge patients with psychiatric emergencies. By integrating tele-psychiatry into the ED workflow, this intervention aimed to improve patient outcomes and operational efficiency in emergency psychiatric care.

Methods: This pilot study evaluated a telehealth intervention implemented in two EDs in North Carolina from May 2, 2023, to January 1, 2024. Baseline data was unavailable. The intervention shifted hospital-based in-person psychiatric evaluations to a model combining US Acute Care Solutions emergency physicians with a 24/7 remote tele-behavioral health psychiatrist service. Descriptive statistics were calculated for LOS, discharge rates, and the number of unique visits. This retrospective quality improvement study was exempt from institutional review board approval.

Results: At Site A and B, a median of 71 and 14 visits per month were seen during the intervention. At Site A, the percentage of patients admitted was between 33% and 59%. The percent admitted decreased from 51% and 49% in May and June to 41%, 33%, and 42% in July through September before returning to baseline at 49%, 46%, and 59% in October through December (Table 1). At Site B, the percent admitted ranged from 25% to 86% without an obvious trend (Table 1). Median discharge LOS at Site A was 1,411, 1,559, 1,200, 1,191 minutes in May through August and then lower in September through December at 866, 1,015, 779, and 895 minutes. For Site B, discharge LOS was 938, 715, 1,585, and 600 minutes in the first 4 months of the intervention and then 581, 670, 1,006, and 525 minutes in the second half. Median admitted LOS at Site A ranged from 1,605 to 3,499, but was generally lower in the last 3 months (2,502, 2,066, and 2,262 minutes) than in the initial months (2,789, 2,762, and 3,499 minutes). At Site B, median admitted LOS showed an inconsistent pattern ranging from 1,393 to 6,303 minutes. Median time from initial call to tele-psychiatric consultation completion showed slight improvement over the 8 months of the intervention at both sites (121, 104, 106, 114, 108, 103, 91, and 101 minutes in May through December).

Conclusion: The integration of tele-psychiatry services into ED operations demonstrates potential in expediting psychiatric evaluations, reducing LOS for certain patient groups, and increasing the rate of discharges. This pilot study suggests that telehealth can be an effective component of psychiatric emergency care, offering a promising avenue for future research and operational enhancements in EDs.

Site A

Month	Discharge (n)	Admit (n)	All (n)	Admit (%)	Median LOS - discharge (minutes)	Median LOS - admit (minutes)	Median LOS - all (minutes)
May	41	43	84	51%	1411	2789	2120
June	42	40	82	49%	1559	2762	2338
July	38	26	64	41%	1200	3499	2270
August	58	28	86	33%	1191	1605	1276
September	41	30	71	42%	866	3447	1567
October	36	35	71	49%	1015	2502	1450
November	38	33	71	46%	779	2066	1276
December	29	41	70	59%	895	2262	1541
Total	323	276	599	46%			
Median	39.5	34	71				

Site B

Month	Discharge (n)	Admit (n)	All (n)	Admit (%)	Median LOS - discharge (minutes)	Median LOS - admit (minutes)	Median LOS - all (minutes)
May	7	4	11	36%	938	6303	944
June	1	6	7	86%	715	2583	2348
July	10	8	18	44%	1585	2105	1690
August	9	6	15	40%	600	3095	662
September	10	9	19	47%	581	1854	889
October	9	3	12	25%	670	5841	843
November	11	8	19	42%	1006	1393	1280
December	5	3	8	38%	525	2124	849
Total	62	47	109	43%			
Median	9	6	13.5				

Yes, authors have interests to disclose

Disclosure: JMP has received payments from CSL Behring, Medtronic, Abbott Point of Care, and Astra-Zeneca for unrelated work.

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141 Patient Portal Usage Characteristics in a Pediatric Emergency Department

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Study Objectives: Health information is increasingly available to patients through patient health portal systems. Recent healthcare initiatives such as the 21st Century Cares Act Final Rule have promoted patient open access to health data. Despite increasing data availability, studies on portals in adult patient populations have demonstrated disparities in usage amongst different groups. Users differ from non-users with respect to sociodemographics and characteristics of emergency department utilization. These findings may not be completely applicable to patients of pediatric emergency departments (PED), where notable differences in this population include information-seeking by proxies, access to a minor's information and special considerations related to confidential health information access for minors. Patient portal usage by PED patients and their proxies has not yet been described. The study objective was to describe patient characteristics and PED encounter characteristics of portal users and non-users. We also aimed to evaluate how portals are being used with respect to timing and prevalence of specific portal functions.

Methods: This was a single-center retrospective analysis of patients who presented to a urban, tertiary care pediatric emergency department. Inclusion criteria were patients from birth to 21 years of age with an emergency department encounter in the electronic health record from September 1, 2020 to May 22, 2022. Those with registered portals were defined as Users, while those not registered for portals were defined as Non-users. Patient and encounter characteristics were compared amongst Users and Non-users using logistic regression. Specific portal functions were analyzed for prevalence and timing of usage with respect to the PED encounter.

Results: In total, 29,881 patients were included. Users made up 48.4% of patients. Patient variables associated with higher likelihood of being a User included Hispanic ethnicity (OR 1.24 $p<0.001$), Other race (OR 1.77, $p<0.001$) and Unknown race (OR 2.4, $p<0.001$). All other patient age groups in comparison to age birth to 1 year old were associated with lower likelihood of being Users. Patient male sex (OR 0.90, $p<0.001$), non-English primary language (OR 0.64, $p<0.001$) and Unknown ethnicity (OR 0.72, $p<0.001$) were also associated with lower likelihood of being a User. The single encounter variable associated with higher likelihood of being a User was PED length of stay greater than 6 hours (OR 1.26, $p<0.001$). With respect to timing, overall usage of portals during the PED visit was not common. Viewing and updating contact information and allergies were least commonly used during the PED visit (1% of users). The most commonly used portal functions during visits were logging in and viewing of laboratory and imaging results (17% of users). Over half of portal users viewed laboratory and imaging within 72 hours of the ED encounter.

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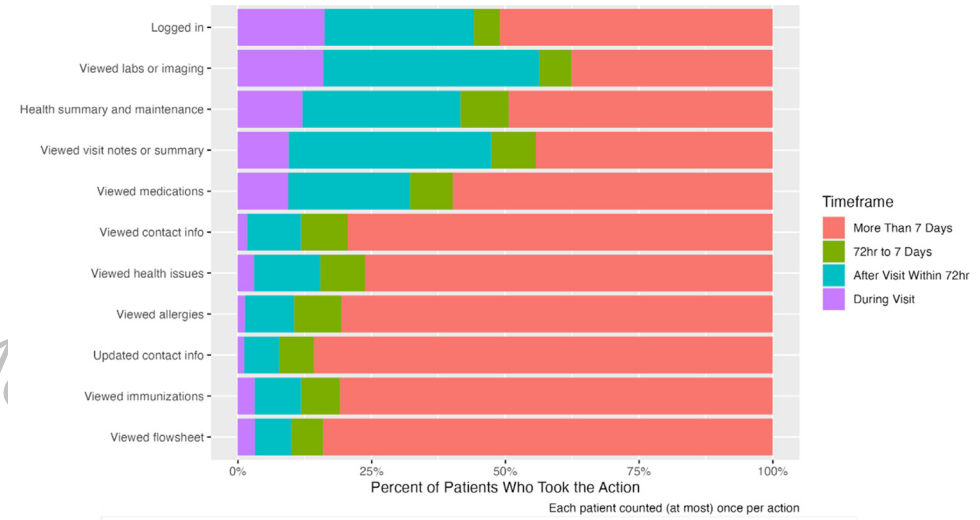
Figure. Prevalence and timing of portal actions relative to PED visit



Conclusions: We identified potential patient and encounter-related differences between portal users and non-users in the pediatric emergency department. To our knowledge, this study was the first to identify PED length of stay and Hispanic ethnicity as contributing factors to usage of portals. Real-time usage of portals remains uncommon. Portals appear to be most utilized to view laboratory and imaging data after the emergency visit. Future efforts can be targeted to understand and increase engagement of under-active groups.

No, authors do not have interests to disclose

142 Derivation and Validation of a Clinical Risk Score to Predict Need for Intensive Care Unit Utilization After Initial Emergency Department Evaluation of Patients With Acute Traumatic Injuries

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Study Objectives: Patients suffering from acute traumatic injuries often require significant health care resources that must be rapidly mobilized, including intensive care unit (ICU) placement. Lack of timely ICU care for trauma patients is an independent risk factor for increased complications and patient mortality. With hospital ICU capacity facing challenges due to high occupancy rates and staffing shortages, early prediction of the needs of patients with traumatic injuries could facilitate efficient utilization of beds. The objective of this study was to derive and validate a clinical risk score capable of identifying patients requiring ICU care utilizing only data available during the initial assessment of trauma patients.

Methods: Data from trauma encounters spanning 2010-2021 were extracted from the US National Trauma Data Bank (NTDB), which contains data from all trauma encounters at ACS-verified Level 1 and 2 trauma centers for those years. Study participants included patients over the age of 17 who were evaluated at a Level 1 or 2 verified trauma center and subsequently admitted for inpatient care. Participants were excluded if data for their emergency department length of stay was missing or if patients were transferred to or from other hospitals. To create the clinical risk score, a training set was created using valid encounters from 2010-2020 that were randomly split into training (60%), testing (10%), and validation (30%) sets. Stepwise logistic regression (sLR) algorithms were trained to predict need for an ICU during the subsequent hospitalization using the following features available at the time of initial trauma assessment: initial vitals, age, sex, diagnosis codes, and procedure codes. The model feature log-odds were used to design a clinical risk score, which was tested on a validation dataset, as well as all encounters from 2021.

Results: Among 1,294,156 included encounters, 538,365 (41.6%) comprised the validation dataset. Encounter demographics were 61.6% male, 70.5% white, 15.6% black, 57.9% Level 1, 28.7% under 35 years old, and 26.4% over 70 years old. The sLR models predicting eventual and immediate need for ICU care had ROC AUC scores of 0.82 and 0.88 respectively on the test data, with derivative clinical scores demonstrating ROC AUC performance of 0.83 and 0.85 on the validation data. The score predicting need for immediate ICU care had sensitivity of 91% and specificity of 54%. Meanwhile, the score predicting the need for eventual ICU care had sensitivity of 89% and specificity of 54%. There were no significant differences in performance across racial subgroups, though slightly higher inaccuracy rates were observed for males (adjusted odds ratio of a mistake = 1.04 and 1.33; $p < 0.001$ for immediate and eventual ICU care need, respectively).

Conclusions: Early in the trauma evaluation process at Level 1 and 2 trauma centers, the need for ICU care can be predicted with high sensitivity and moderate specificity. The clinical risk scores presented demonstrated consistent performance across external data and sustained their efficacy over time. Implementation of these rules may enhance the ICU bed reservation and assignment process for trauma patients in the context of enhancing admitting clinician sensitivity when considering ICU care or through ruling out patients who likely do not require ICU services. Further research is warranted to evaluate the impact of these clinical risk scores on placement metrics and patient outcomes, however.

No, authors do not have interests to disclose

143 Predictors of Cardiac Injury in Blunt Trauma: A Contemporary Analysis

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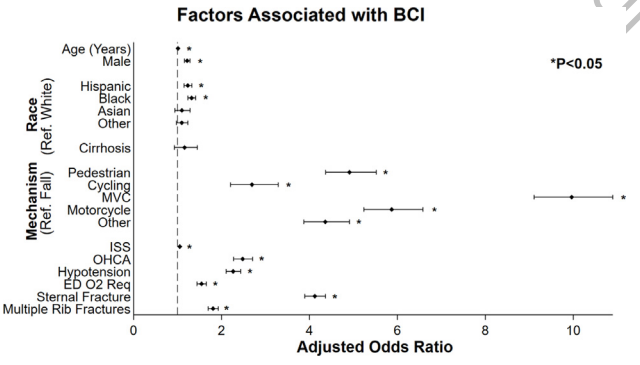
Study Objectives: Unlike penetrating traumas to the chest, diagnosing cardiac injuries from blunt trauma is challenging and requires a high degree of suspicion. Although cardiac injuries occur in less than 10% of all trauma admissions, approximately a fourth of trauma-related mortality are cardiac related. Thus early diagnosis and management of blunt cardiac injury (BCI) is paramount to minimize morbidity and mortality. The primary objective of this study was to elucidate patient and clinical factors which were associated with cardiac injury in patients who sustained blunt trauma. Furthermore, we identified predictors of clinical outcomes in those with BCI.

Methods: This was a retrospective study utilizing the National Trauma Data Bank (NTDB) 2017-2019 participant user files. All adults (>15 years) who sustained blunt trauma were incorporated in the study. Patients who sustained cardiac injury were ascertained utilizing the *International Classification of Diseases, 10th Revision* (ICD-10) diagnosis codes. Patient, clinical, and hospital characteristics including age, sex, race,

mechanism of blunt trauma, vital signs, trauma designation, and hospital size were defined in accordance to the NTDB data dictionary. Multivariable regression models were used to examine factors associated with cardiac injury as well as in-hospital mortality in adults who sustained blunt cardiac injury.

Results: Among the 2,493,474 patients sustaining blunt trauma, 8,964 had cardiac injuries (0.4%). Cardiac injury was most common in subjects involved in motor vehicle accidents (62.2% of cases). Those diagnosed with cardiac injury had greater rates of concomitant sternal (29.3 vs 2.6%, $p<0.05$) and multiple rib fractures (22.6 vs 2.3%, $p<0.05$) as well as intrathoracic vascular injury (5.2 vs 0.5%, $p<0.05$) compared to those without cardiac injuries. Adults who had traumatic cardiac injury more frequently had outside of hospital cardiac arrest (OHCA) compared to those without (20.5 vs 0.9%, $p<0.05$). In addition, they had greater median ISS (9 vs 22, $p<0.05$), higher rates of ICU admission (20 vs 32.7%, $p<0.05$), operative intervention (8.4 vs 17.9%, $p<0.05$), and mortality (36.2 vs 3.2%, $p<0.05$). On adjusted analysis, hypotension (AOR 2.26, 95% CI 2.10-2.44), sternal (AOR 4.12, 95% CI 3.89-4.37) and multiple rib fractures (AOR 1.81, 95% CI 1.70-1.93), motor vehicle accidents (AOR 9.96, 95% CI 5.24-6.58), and oxygen supplementation in the emergency department (AOR 1.54, 95% CI 1.44-1.66) were associated with increased risk of BCI. 4.3% of all adults with BCI underwent pericardiocentesis or pericardiotomy. Of these patients, 2.1% underwent some form of pericardial drainage within 24 hours of hospital presentation. After adjustment of covariates, age (AOR 1.03, 95% CI 1.02-1.03), Hispanic (AOR 1.35, 95% CI 1.07-1.71) and Black race (AOR 1.39, 95% CI 1.12-1.72), blunt pedestrian trauma (AOR 1.86, 95% CI 1.31-2.62), OHCA (AOR 17.0, 95% CI 13.08-22.09), hypotension (AOR 3.72, 95% CI 3.12-4.43), and oxygen requirement in the emergency department (AOR 2.63, 95% CI 2.23-3.10) were among factors associated with mortality in those diagnosed with BCI.

Conclusion: Blunt cardiac injury portends a poorer prognosis compared to those without. Thus early diagnosis in the emergency department helps facilitate timely communication with surgical consultants in the event that operative intervention becomes warranted. In adjunct with current diagnostic modalities such as the utilization of point-of-care ultrasound, incorporation of these predictors of BCI elucidated in this study should prompt early investigation and surgical consultation.



No, authors do not have interests to disclose

144 Outcomes From an Emergency Department Observation Program for Mild Traumatic Brain Injuries

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Background: The management of mild traumatic brain injury (mTBI) patients in an emergency department observation program (EDOP) has been found to be safe. Previous studies were performed in facilities with neurosurgical services who were available for consultation if there was a clinical deterioration. There has yet to be a study evaluating the safety of managing mTBI patients at non neurosurgical facilities.

Study Objectives: As part of an integrated health system with limited neurosurgical coverage, we devised an evidence based protocol to safely manage patients with mTBI in EDOP to decrease unnecessary transfers from 5 emergency departments (EDs).

Methods: From Oct 2021 through Dec 2023, patients with mTBI from 7 EDs were evaluated for our protocol. Five of the EDs were in the community and 2 of the EDs had neurosurgical coverage. We defined low risk-mTBI as: GCS 15, age>18, small volume of subarachnoid hemorrhage, contusion or traumatic intraparenchymal hemorrhage (IPH), subdural hematoma (SDH) <4mm, and non-depressed skull fractures. We excluded anticoagulation (AC) except patients on aspirin. Once patients met inclusion criteria, there was telephonic discussion with neurosurgery and remote CT review. Patients were observed and had a repeat CT scan at 8h and if unchanged radiographically and clinically then the patients were discharged with neurosurgical follow up.

Results: 114 patients were included in our mTBI EDOP. The average age was 69.9yo (range 5-100) while the median age was 75yo. Mean length of ED stay was 10.2 hours. CT findings: 63% SDH, 40% SAH, 8% IPH, 1% skull fracture. 98 patients met our inclusion criteria from the 7 EDs and 96 (97%) were safely discharged after their repeat CT imaging. The two patients that had progression on CT were admitted without clinically significant deterioration during their hospitalization. 97% of the patients that were in the community EDOP did not require transfer. There were 16 patients that should have been excluded due to use of AC. From this population, 25% had a clinically significant event defined as ICU admission or death during admission.

Conclusions: Patients with mTBI can be safely managed in a community EDOP while reducing unnecessary transfers between hospitals. Ninety seven percent of mTBI patients were safely discharged without direct neurosurgical consultation. Protocol deviation (use of AC) is associated with increased risk of clinical deterioration.

No, authors do not have interests to disclose

145 In Plain Sight: Evaluating the Pubic Symphysis on Standard FAST Views

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Background: Major pelvic ring disruptions in the setting of blunt trauma are associated with significant morbidity and mortality. Focused assessment with sonography in trauma (FAST) is utilized during the initial trauma survey to identify patients with hemoperitoneum who may require laparotomy; however, pelvic injuries are not evaluated using the FAST. Patients with pubic symphysis (PS) diastasis, indicating a major pelvic ring disruption, are typically placed in a pelvic binder to stabilize the pelvis and limit ongoing blood loss. However, patients with a normal PS and no major pelvic ring disruption may be harmed by unnecessary pelvic binder placement. Therefore, prior studies have proposed adding a dedicated view of the pubic symphysis (PS) using a linear transducer to evaluate for PS widening >25 mm. While this method was shown to have high accuracy compared to CT, it requires additional time and dedicated views.

Study Objectives: Our objective was to retrospectively evaluate (1) how frequently the PS was visualized on the standard FAST examination using the normal curvilinear transducer, and whether (2) a visually normal PS on POCUS excluded PS diastasis on radiology imaging.

Methods: We reviewed electronic medical records (EMR) and a point-of-care ultrasound (POCUS) database at academic Level 1 trauma center with >50,000 patient visits annually. Adult (^{3}18 years old) patients who had a FAST performed in the emergency department (ED) between November 1, 2021 and November 1, 2023 using either handheld POCUS (Butterfly iQ+, Butterfly Network Inc., Burlington MA) or cart-based POCUS (Sonosite PX, Fujifilm, Bothell WA) for the indication of blunt trauma were included. Two emergency physicians with ultrasound fellowship training reviewed the saved FAST images to retrospectively determine if a congruent PS was visualized, versus a widened (>25 mm) or non-visualized PS. The PS was considered visualized if either reviewer recorded it as visualized. If a patient received multiple FAST examinations in the ED, only the first was included. Standardized data abstraction was performed using REDCap for demographics and radiology- performed imaging results. SPSS was used for descriptive analyses and to assess rater agreement. This study was approved by the Institutional Review Board.

Results: There were 241 FAST examinations performed in the ED for adult blunt trauma patients. The average age was 51 ± 21 years, 66% were male, and the most common mechanisms of injury were motor vehicle collisions (42%) and falls (31%). The prevalence of a pelvic fracture of any type on reference imaging was 15/241 (6.2%), with two cases of PS diastasis. A congruent pubic symphysis was retrospectively visualized on 118 (49.0%) of the saved adult FAST examinations, with all pelvis views obtained using the standard curvilinear transducer as part of a standard FAST exam without intentional focused views of the pubic symphysis. Non-visualization of a congruent PS was 100% sensitive (95% CI 0.2-100.0) for detection of PS diastasis, but not specific (0.49, 95% CI .43-.55). The resulting negative predictive value for

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visualization of a congruent PS was 1.0 (95% CI .96-1.0). Agreement between raters for visualization of the PS was moderate (ICC = .74, 95%CI .65-.80).

Conclusion: A congruent pubic symphysis was visible in nearly half of adult blunt trauma patients undergoing FAST exam in the emergency department, despite the absence of a dedicated PS evaluation. Notably, none of the patients with a normal PS on POCUS had PS diastasis. This pilot data suggests the feasibility of including a PS interpretation as part of the FAST exam.

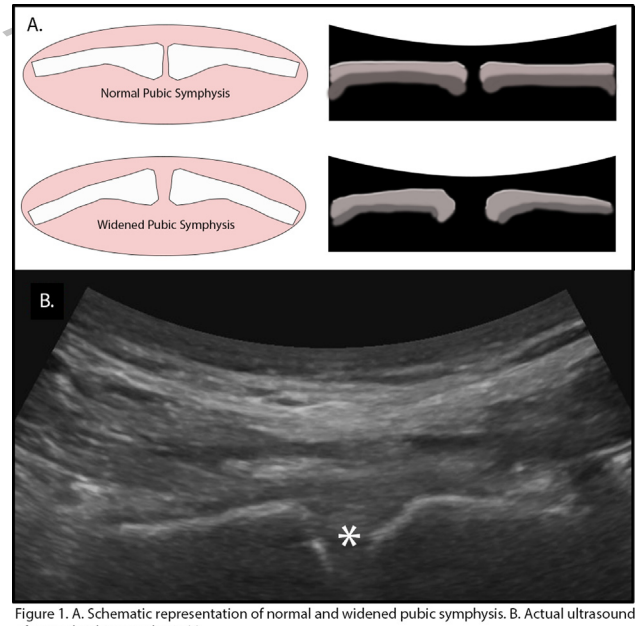

Figure 1. A. Schematic representation of normal and widened pubic symphysis. B. Actual ultrasound of normal pubic symphysis (*).

No, authors do not have interests to disclose

146 Safety and Effectiveness of a Kaolin-Impregnated Hemostatic Device in Anticoagulated Patients: Real-World and Controlled Trial Outcomes

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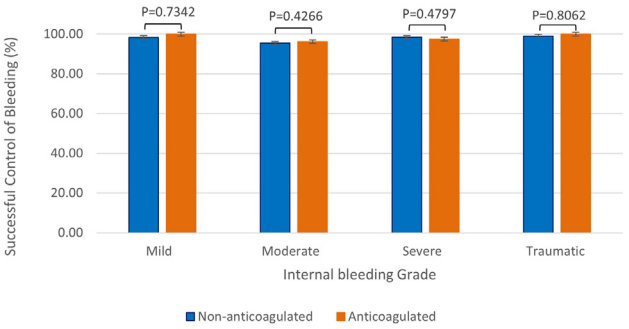
Background: Increased bleeding risk with the use of anticoagulants is a challenge, particularly after traumatic tissue injuries or surgical interventions. Few studies have examined hemostatic device use in patients at high risk for internal bleeding, such as those on anticoagulant and/or antiplatelet therapy. We sought to determine whether the QuikClot Control+ (QCC+) Hemostatic Device, a kaolin-impregnated, non-resorbable hemostatic dressing, is effective and safe in this patient population.

Methods: Analysis of real-world data (RWD) of 404 patient uses of QCC+ from a retrospective medical record review, including 64 emergency physician and trauma surgeon responses, was conducted. Successful control of bleeding and adverse events (AEs) were assessed in cases of mild, moderate, severe and traumatic internal bleeding. Successful control of bleeding was also assessed at each anatomical site of use. A separate secondary analysis of Randomized Controlled Trial (RCT) data of QCC+ use in 152 cardiac surgery patients assessed hemostasis at 5 and 10 minutes and AEs. Both analyses evaluated the impact of anticoagulant medication on the effectiveness of QCC+ to control bleeding.

Results: In the 404 RWD cases, bleeding was successfully controlled in 98.2% (110/112) of anticoagulated cases compared to 97.9% (286/292) non-anticoagulated (P=1.000). Bleeding was successfully controlled for all bleeding grades and at all anatomical sites with no significant difference in the effectiveness of QCC+ to control internal bleeding between anticoagulated and non-anticoagulated patients. There was no significant difference in safety outcomes between the two populations (P=1.000). Of the 152 RCT patients receiving QCC+, there was no significant difference in the proportion of anticoagulated patients (111/152) achieving hemostasis at 5 minutes (79.3% vs. 80.5%; P=0.87) or at 10 minutes (89.2% vs. 92.7%; P=0.52) compared to non-anticoagulated patients (41/152) and no statistically significant difference in safety outcomes (P=0.47).

Conclusion: There was no statistically significant difference in the effectiveness of QCC+ to control internal bleeding or in the safety of QCC+ use in anticoagulated patients compared to non-anticoagulated patients. This study is the first report to demonstrate that internal use of the QCC+ hemostatic device is as effective and safe for control of internal bleeding in anticoagulated patients, regardless of clinical setting, internal bleeding grade or internal anatomical site of use.



Yes, authors have interests to disclose
Disclosure: Teleflex Medical
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147 Development of an Ultrasound Algorithm Enabled Handheld Automated Needle Decompression Device (ANeeD) for Pneumothorax Decompression in a Live Swine Model

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Study Objectives: Pneumothorax (PTX) is the most common thoracic injury in combat casualties (51.8%). Decompression is the standard treatment, but proximity to vital organs makes it a risky invasive procedure. Needle decompression (ND) is often performed ineffectively. Studies demonstrate inappropriate ND placement location and inadequate depth risking vital organ injury or decompression failure. Fast and effective decompression of PTX has been identified by the Defense Health Agency as a priority. A simple to use ultrasound (US) enabled device allowing for push button ND could improve safety and success.

Methods: The ANeeD device has two major components: 1) electromechanical device combining ultrasound transducer, a touch screen graphical user interface (GUI), and a needle actuator with 2) embedded imaging analysis software algorithms. Using a spiral development process these components were integrated into a single electromechanical device. Three 45 kg Yucatan Minipigs each underwent two rounds of device ND testing after anesthetization and chest tube placement. 1000cc of air was instilled into the pleural space and PTX was confirmed with chest x-ray, positive pleural pressures, and absence of lung sliding on ultrasound. The ANeeD device was then used to deploy up to 10 ND per hemithorax. An ultrasound fellowship trained attending emergency physician identified the intercostal midline and pleura using the ANeeD's real-time ultrasound display. Using the GUI he selected a target needle depth approximately 5-7 mm beyond the pleura and activated ND. Intent was to drive the needle through the pig skin however thick callused skin caused 14 and 12 gauge needles to bend. For this reason, an approximately 3 mm epidermal nick below the

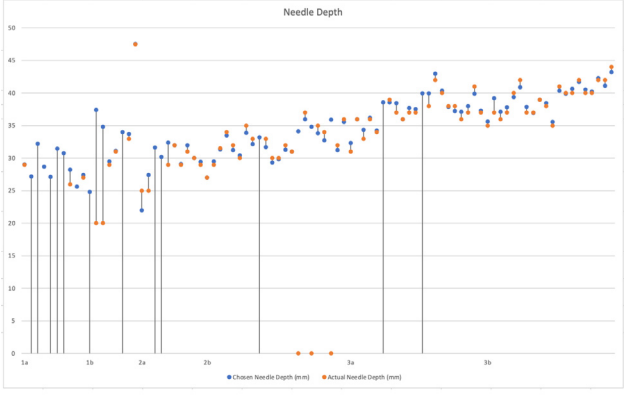
needle was carefully made, as to minimally interrupt the dermis, prior to activation in some attempts during the first 5 sessions and in all 20 ND of the last session. Once penetration had ended ND was confirmed by easy air aspiration via 60 cc syringe. Needle travel distance was manually measured to validate selected needle depth. Animals were survived with chest tube in place and 10-18 days later, the protocol was repeated bilaterally. Data was collected over 6 sessions. On sessions where mechanical issues were noted, further ND attempts were halted to allow design modifications between sessions and minimize swine discomfort. Simple statistics were used to calculate success rate.

Results: Successful ND is described in table 1 with an overall successful rate of 77% and 100% in the final session. Of the successful ND 85% utilized a skin nick. The majority of ND failures were related to the dense mechanical properties of pig skin causing both 12 and 14 gauge needles to bend when driven into the skin. This resulted in observable non puncture (1), motor/needle cradle malfunction (8) or change of trajectory into ribs (5). The remaining 7 failures were postulated to have occurred due to tenting of the pleura creating insufficient depth and non-pleural puncture (4), catheter strangulation by skin (2), catheter sticking to needle (1). The one complication without clinical consequence occurred session 2 when a needle holder broke while advancing the catheter off the needle causing brief cardiac perforation. Graph 1 demonstrates excellent final device depth accuracy with 80% of animal #3 punctures with under 1 mm difference from programmed to measured depth and only 1 measurement over 2 (2.19) mm. Differences may be attributable to manual technique utilizing a ruler and eyeball estimation to measure needle length.

Conclusion: The ANeeD device is highly capable to ND PTX in a live swine model though nicked epidermis and accurately deploys needle to desired depth. ANeeD is capable, but inconsistent, in penetrating intact swine skin to ND PTX.

Animal Session	# Attempts	Total # Successful	# Successful Without Skin Nick
1a	10	5	1
1b	8	5	3
2a	10	7	3
2b	21	15	0
3a	21	17	3
3b	20	20	0

Table 1



Graph 1

Yes, authors have interests to disclose
Disclosure: Fujifilm/Sonosite and Creare LLC
Consultant/Advisor Fujifilm/Sonosite and Creare LLC
Disclosure: Creare LLC
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148 Abnormal Lung Ultrasound Features Are Highly Prevalent in Smoke Inhalation Patients

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Study Objectives: Smoke inhalation (SI) can cause smoke inhalation lung injury (SILI) leading to significant morbidity and mortality. SILI is the leading cause of death at the scene of fires. There is a critical need for portable, accurate point-of-care technology for the rapid evaluation of patients with SI and possible SILI by emergency medical response providers, and for guiding appropriate triage and treatment of patients with SI and possible SILI by emergency department and burn center physicians. While healthcare providers routinely use lung ultrasound (LUS) to evaluate lung trauma and disease, LUS findings in SI patients have not been described. We initiated a multi-center clinical study to discover if SI results in LUS abnormalities.

Methods: In 6 military and civilian burn centers (Medstar Washington Hospital, US Army Institute for Surgical Research, Wake Forest Baptist Medical Center, Legacy Emanuel Oregon Burn Center, Loyola University Medical Center, University Medical Center New Orleans) patients were screened on admission and approached for consent and enrollment based on a history of SI or suspected SILI. LUS scanning was performed on subjects using a Lumify ultrasound device with a curvilinear (C5-2) transducer (Philips, Cambridge NA). The protocol consisted of 14 scanning zones, but when a zone could not be scanned (eg, a patient could not be rolled), the number of scanned zones was limited (eg, to only the anterior zones). Deidentified images were annotated by at least 2 physician LUS experts, each assigning severity scores (SS) for the presence and severity of pathologic features. Severity scores ranged from 0 (normal) to 4 (severely abnormal) and were assessed for pleural line, pleural effusion, consolidation, B-lines, and overall impression as previously described (Baloescu et al, WFUMB, 2023). Disagreements on SS were adjudicated by a third physician LUS expert and by consensus when needed.

Results: Ultrasound videos were acquired for 99 subjects admitted to burn centers with a history of SI. Of the 99 subjects enrolled, 79 had a LUS scan performed < 48 hours post-SI (median time: 21 h; range: 1.5 – 48 h) and the scanned zones were from at least 3 chest regions (anterior, lateral, and posterior) representing both hemithoraces (ie, there was bilateral representation in the zones scanned). Figure 1 shows for each LUS feature the percentage of those 79 subjects with SS of 0 to 4. A standard "negative LUS" is defined by the presence a regular PL, the absence of both CON and PE, and few discrete BL. Therefore, the videos were assessed for findings outside of a standard "negative LUS". Of the 79 SI subjects, 78 subjects (99%) had at least one video with at least one abnormal LUS feature (PL >1, PE >1, CON >1, or BL >2). Forty-one subjects (52%) had at least one video with LUS feature scores of PL >2, PE >2, CON >2, or BL >3. Sixty-one subjects (77%) had 2 or more lung zones with at least one abnormal LUS feature (PL >1, PE >1, CON >1, or BL >2).

Conclusion: This observational study demonstrates a high prevalence of abnormal features in SI subject's LUS images. Our ongoing study is to determine whether there is an association of these LUS abnormalities with degrees of smoke inhalation lung injury. LUS may represent a new, safe, easy to train, rapid, point-of- injury/care technology for evaluating patients with SI and possible SILI.

Disclosures: Funding and technical support for this work is provided by the Biomedical Advanced Research and Development Authority (BARDA), under the Administration for Strategic Preparedness and Response (ASPR), within the U.S. Department of Health and Human Services (HHS), under ongoing USG Contract No. 75A50120C00097. For more information about BARDA, refer to https://www.medicalcountermeasures.gov/.

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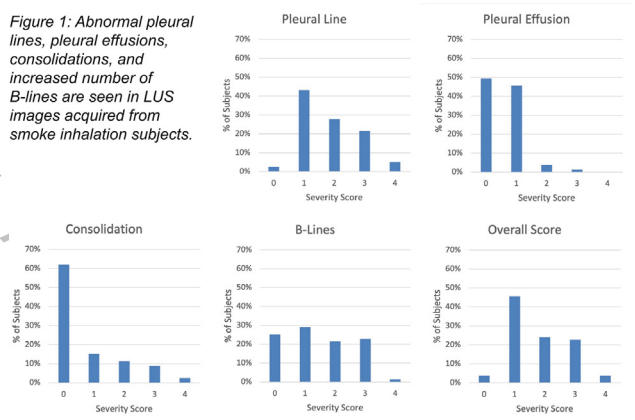

Figure 1: Abnormal pleural lines, pleural effusions, consolidations, and increased number of B-lines are seen in LUS images acquired from smoke inhalation subjects.

Yes, authors have interests to disclose
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Biomedical Advanced Research and Development Authority

149 Artificial Intelligence Model to Identify the Common Femoral Artery for Guiding Advanced Endovascular Procedures

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Study Objectives: Hemorrhage remains a leading cause of death in both military and civilian populations and is the leading cause of death for U.S service members who sustain potentially survivable injuries. Bringing life-saving interventional capabilities such as Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) or Extracorporeal Membrane Oxygenation (ECMO) have the potential to improve survival rates. However, the most challenging aspect of applying endovascular resuscitative techniques for hemorrhage control is early common femoral artery (CFA) access. Without a method to guarantee femoral access in austere and resource- limited locations, the translation of endovascular interventions to prehospital settings cannot be fully realized. To address this, we demonstrate the feasibility of an artificial intelligence (AI) model to detect the CFA during an ultrasound sweep of the femoral region.

Methods: Study Design: Two-center, prospective, observational study approved by Institutional Review Boards.

Data: Attending emergency physicians acquired cine loops of bilateral femoral anatomy that included the CFA, common femoral vein, femoral bifurcation, and femoral head by scanning the transducer from the knee toward the groin. Bi-plane and monoplane B-mode ultrasound cine loops were collected from 21 patients (N=11 at Yale University and N=10 at the University of Utah) using a matrix transducer (Philips XL14-3). Subjects ranged from 32-82 years of age with a BMI range of 15-50. Additionally, femoral ultrasound data collected under a prior study comprising 13 healthy volunteer scans (30,839 frames from 22 video sequences) were also used for model development.

Image annotation: An attending emergency physician first annotated bounding boxes for CFA, superficial femoral artery (SFA), profundal femoral artery (PFA) and common femoral vein (CFV) in a key frames per cine loop. Key frames were defined as the first and last frame in which CFA, SFA, PFA and CFV were seen. Based on the key frame annotations, the remaining frames of each cine-loop were annotated for the CFA, SFA, PFA and CFV by two researchers.

Algorithm: An object detection AI model (YoloV5-small) with low inference time and memory requirements was chosen with the goal of mobile device deployment. The model was trained and tested to classify and localize the CFA on individual frames. The patient dataset is comprised of 24 videos and 3,006 annotated frames. Five-fold cross validation was performed to train and evaluate the model. The model was first pretrained to detect superficial and tibial artery by leveraging the healthy volunteer scans and then fine-tuned on the 5-fold training sets. The specificity and sensitivity of AI-predicted localizations were calculated. True detection occurred if the model correctly predicted the presence of the CFA in an image with sufficient overlap relative to human annotated bounding boxes (defined as Intersection Over Union (IOU) of >0.5 between predicted and human annotated bounding boxes).

Results: The AI model showed a sensitivity of 0.78 ± 0.17 (mean ± SD among 5 folds) and a specificity of 0.94 ± 0.041 in detecting the CFA. The high specificity is particularly desired to aid procedures such as REBOA to avoid needle insertion into the wrong vessel.

Conclusions: This work demonstrates that a lightweight AI-based CFA detection is feasible in a free-hand femoral ultrasound sweep. Future work will further optimize model performance to improve sensitivity. The model may facilitate user guidance for advanced endovascular procedures by automating CFA detection, making the procedure accessible to less trained users including first responders.

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150 ULTRA-EYE: Automated Ultrasound Technology for Retinal Detachment Assessment

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Study Objectives: Early diagnosis of Retinal Detachment (RD) can improve the rate of successful reattachment and quality of vision, especially before macular involvement. Point-of-care (POC) ocular ultrasound has been shown to be a reliable diagnostic tool for rapidly evaluating patients with suspected RD. Multiple studies have demonstrated excellent sensitivity and specificity for accurately identifying RD with POCUS, but additional innovations are needed to enhance its adoption into routine clinical practice. Accurately interpreting ocular ultrasound images and differentiating between RD and other ocular pathologies (eg, posterior vitreous detachment [PVD]) require expert recognition of normal sonographic anatomy, normal variants, and pathology, which makes the skill level of the healthcare provider a principal limitation in the current use of POC ultrasound to detect RD. We hypothesize that Deep Learning (DL) algorithms will have accurate diagnostic capability to detect ultrasound findings specific to RD and macular involvement on ultrasound images. Our objective was to develop and validate a DL algorithm for the detection of RD and discerning macular status (macula-on or macula-off) in the ocular ultrasound images.

Methods: We created a robust ocular ultrasound image dataset along with reference standard labels at the image level. All images were initially classified into two categories: RD and Non-RD. The RD images were further classified into RD with intact macula and RD without intact macula. Non-RD included images with normal retina or PVD. Curated data were randomly assigned into training, validation, and test datasets. For the DL model development, we adopted a novel approach for the stage-wise classification of ocular ultrasound images. Our methodology employed an ensemble model comprising two consecutive ResNet classifiers: ResNet-34 and ResNet-18. Initially, the ultrasound images underwent a binary classification process distinguishing between normal vs. abnormal. Subsequently, a separate pipeline categorized the images into macula-off or macula-on conditions. In addition to the frame based retinal detachment approach we implemented a novel end-to-end video-based detection and classification approach.

Results: In our preliminary DL model development, we utilized a total of 750 cases out of which 60 percent is for the retinal detachment classifier training and the rest for the macula on/off classifier. To test our classifier, we used test data of unseen cases. Our testing yielded an accuracy of 82.5%. Specifically, per class accuracy for normal, PVD and RD was 80, 80 and 85 percent, respectively. In the end-to-end video-based detection and classification approach, across 168 patients, our method achieved an F1 score of 79.04%, with precision and recall metrics at 79.518% and 78.57%, respectively. Additionally, by extending the analysis to identify the attachment status of the patient's macula, we demonstrated an overall accuracy of 92% with precision and recall metrics at 92% and 90%, respectively.

Conclusions: Our preliminary results suggest our frameworks hold a significant potential to augment clinical decision-making processes by developing a DL model to detect that can detect RD and determine whether the macula is intact.

No, authors do not have interests to disclose

151 Point-of-Care Ultrasound Outcomes and Integration for Sepsis in the Emergency Department

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Study Objectives: Sepsis is a leading global cause of morbidity and mortality, and results in approximately 970,000 hospital admissions annually in the United States according to the Society of Critical Care Medicine. Patients presenting to the emergency department (ED) with sepsis benefit from early fluid resuscitation, antibiotics, and vasopressors if hemodynamically unstable. Bedside point-of-care ultrasound (POCUS) can be used in the ED to rapidly assess fluid tolerance, identify potential sources of infection, and assist with procedures. No studies have investigated associations of POCUS with improving time-related outcomes in septic patients, such as reducing time for vasopressors. This study primarily assessed the association between receiving POCUS and time-related patient outcomes in the ED. Our secondary objective identified types of POCUS examinations being performed, and characteristics associated with receiving POCUS among patients with sepsis in the ED.

Methods: This IRB-approved retrospective review examined hospital encounters from January 1, 2018 to June 30, 2023 for a Level-1 academic trauma center in Upstate South Carolina. Eligible adults (18+) were diagnosed in the ED with an ICD-10 code for sepsis, and had either a lactic acid > 4, one recorded mean arterial pressure (MAP) < 65, or one systolic blood pressure < 90mmHg. Chi-square and T-tests were used to assess differences in the distribution of sociodemographic and clinical variables by POCUS status. Adjusted linear regression was used to assess the relationship between POCUS and time to vasopressors, ED length of stay (LOS), hospital LOS, and intensive care unit (ICU) LOS.

Results: Of 3,968 eligible patients, the mean age was 65.2 (SD 16.6). Half were female, 76.6% were Caucasian, and 68.8% were enrolled in Medicare. Five hundred and two (12.7%) patients received POCUS. The patients receiving POCUS were significantly more likely to be triaged with an ESI level of immediate/emergent (86.9% vs 81.7%, p = 0.0049) compared to those without POCUS. Patients with increased respiratory rate (aOR 1.02, 95% CI 1.00 – 1.03, p = 0.0107) and lower systolic blood pressures (aOR 0.99, 95% CI 0.99 – 1.00, p = 0.0327) were also more likely to receive POCUS. Patients receiving POCUS were significantly more likely to be admitted to ICU (64.9% vs 52.1%, p = <0.0001), and were more likely to receive vasopressors (51.6% vs 30.7%, p = <0.0001). The most common POCUS exam performed among the septic population was limited echocardiography (54.4%), followed by thoracic ultrasound (15.5%), and peripheral IV placement (9.4%). On average patients that received POCUS had vasopressor therapy initiated 21.3 minutes earlier than compared to the non-POCUS group, however the difference between the two groups was not statistically significant (p = 0.0906). Receiving POCUS in the ED was not significantly associated with average ED, hospital and ICU LOS.

Conclusion: POCUS was used in the minority of patients diagnosed with sepsis in the ED, and these patients receiving POCUS were more likely to have higher level of triage acuity and to be admitted to the ICU. The majority of POCUS exams performed were echocardiography, lung, and procedural guidance suggesting that POCUS was primarily utilized to assess fluid tolerance as opposed to identifying sources of sepsis. POCUS has the potential to guide management for patients with sepsis and to have clinically relevant impact to initiation of treatment and ED disposition, such as vasopressors and ICU admission. Future studies should further examine the role of POCUS in managing sepsis in the ED.

No, authors do not have interests to disclose

152 Accuracy of Point-of-Care Ultrasound in Detecting Retained Products of Conception

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Study Objectives: Retained products of conception (RPOC) refers to residual intrauterine tissue that can occur after a recent birth, pregnancy termination, or miscarriage. Ultrasound is the primary diagnostic modality for RPOC, but the accuracy of point-of-care ultrasound (POCUS) has not been evaluated for this diagnosis. Our aim was to determine the accuracy of POCUS in detecting RPOC, and to evaluate the management of RPOC in the emergency department (ED).

Methods: This was a cross-sectional study of all patients presenting to an urban academic ED with over 100,000 annual visits between January 1, 2017, and December 31, 2023, that included ED patients ≥ 18 years old who had a pelvic POCUS performed during the study period, with no identifiable intrauterine pregnancy. Patients were excluded if their age was greater than 55, if there was inadequate chart data, or if there were inadequate POCUS images. Chart review was conducted by three nonblinded investigators who looked at patient demographics, history concerning for RPOC, radiology performed ultrasound results, and patient outcomes such as need for transfusion, operating room, medical management, admission, and ED return visits within 72 hours. Two ultrasound fellows reviewed POCUS exam images, blinded to the chart review, labeling whether RPOC was present, absent, or indeterminant. RPOC on POCUS was defined as heterogenous or hyperechoic products > 1 cm within the endometrium, and did not include the presence or absence of color Doppler flow. Kappa was 0.73 (substantial agreement) for POCUS studies, with 27 discrepancies adjudicated by an ultrasound trained faculty member with over 20 years experience. The diagnosis of RPOC on chart review was radiology ultrasound and obstetrics and gynecology diagnosis for patients who did not receive a radiology ultrasound.

Results: A total of 703 patients were included in the study, with 58 exclusions, leaving 645 patients for analysis. Radiology ultrasound was performed in 512 patients (79.4%) and identified 42 cases of RPOC. In the 133 patients who did not receive a radiology ultrasound, 11 were confirmed to have RPOC based on obstetrics and gynecology diagnosis, for a total of 62 patients with RPOC (a 9.6% prevalence). There were 70 total POCUS exams identified as RPOC, with 17 indeterminant exams. POCUS had a 96.2% specificity (95% CI; 94.3% - 97.6%) and a 77.4% sensitivity (95% CI; 65.0%-87.1%) for the diagnosis of RPOC, with a LR+ of 20.5 (95% CI; 13.3-31.6), and LR- of 0.23 (95% CI; 0.15-0.37). If all indeterminant POCUS exams were considered positive for RPOC, the specificity decreased to 93.5% (95% CI; 91.2%-95.4%), and the sensitivity was 80.3% (95% CI; 68.2%-89.4%). For the 265 patients (41.1%) in the study with history concerning for RPOC, the POCUS specificity and sensitivity was 93.8% (95% CI; 89.6%-96.6%) and 79.0% (95% CI; 66.1%-88.6%) respectively. Of the 62 patients with RPOC, 21 (33.9%) were admitted, 26 (41.9%) had a surgical procedure, 26 (41.9%) were managed medically, and 13 (21.0%) were expectantly managed. False positive POCUS studies for RPOC included early pregnancy, ectopic pregnancy, endometritis, cervical stenosis, cervical laceration, and pregnancy of unknown location.

Conclusion: POCUS was 96.2% specific and 77.4% sensitive for diagnosing RPOC, and patients with RPOC more commonly were managed surgically or medically as opposed to expectantly managed. The authors exercise caution making the diagnosis of RPOC in patients in early pregnancy given the variable appearance of the endometrium on transabdominal POCUS during early pregnancy.

No, authors do not have interests to disclose

153 POCUS Mastery: A Holistic Approach to Ultrasound Proficiency Assessment

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Study Objectives: Point-of-care ultrasound (POCUS) is essential to the emergency physician. Longitudinal POCUS curricula are commonplace, however the current volume based residency requirement for POCUS fails to provide a comprehensive evaluation of proficiency. While EM milestones for patient care (#3 and #8) indirectly include assessment of POCUS proficiency, they lack specificity in terms of objective evaluation. This leaves standardization of POCUS proficiency across EM programs challenging and susceptible to inadequate assessment. We developed a comprehensive POCUS proficiency evaluation strategy based on the I-AIM (Indication, Acquisition, Interpretation, and Medical Management) framework, which describes the necessary skill domains required for an adequate exam. The purpose of this novel evaluation strategy was two-fold: (1) Provide an objective assessment of all aspects of POCUS proficiency and (2) Identify gaps in POCUS performance earlier in training to facilitate focused learning plans for individual residents.

Methods: Using the I-AIM framework, a 4-pronged evaluation strategy was developed: (1) Residents had to perform ≥ 150 POCUS exams (2) Exams were rated on the 0-5 scale according to the ACEP ultrasound imaging quality guidelines. An average rating ≥ 3 was required to graduate. (3) Monthly image interpretation quizzes

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(4) Yearly in-person technical skill and clinical integration testing. A middleware solution, online quiz platform, and cloud-based database were utilized to manage resident proficiency progress.

Results: With our novel evaluation system, 50% of residents met US proficiency by mid PGY-2 year and 80% by mid PGY-3 year. This strategy identified residents earlier in their program who may be at risk of not meeting POCUS proficiency by the end of PGY-3 year allowing for tailored education strategies based on specific areas of deficiency.

Conclusion: With a more granular evaluation strategy, we observed not only earlier detection of residents struggling with ultrasound proficiency but also a better understanding of the specific area of deficiency. This ranged from a specific POCUS application, to a domain such as technical ability or image interpretation. This allows for more effective and tailored educational strategies that are objective and actionable. We believe our novel approach to POCUS evaluation can serve as a model for other residency programs seeking to improve POCUS training and assessment.

No, authors do not have interests to disclose

154 Effects of a "Casino Night Schedule" on Emergency Physician Wellness

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Study Objectives: This study aims to evaluate the impact of a "Casino Night Schedule" on the satisfaction and wellness of emergency physicians (EPs). Inspired by casino practices, we implemented a 4am shift turnover to facilitate anchor sleep, a strategy which prioritizes sleep during the same 4-hour window each day to improve recovery and sleep quality for shift workers. Parameters evaluated include minutes of deep sleep, degree of sleepiness, physician satisfaction and changes in stress biomarkers. Prior studies have focused on qualitative assessments of efficacy. This study evaluated the change in objective data and improvements through implementation of a casino schedule.

Methods: This blinded, controlled trial was performed over a 6-month period on emergency physicians at a Level 1 Trauma Center with an annual patient volume of approximately 95,000 visits. Study subjects participated in a block of traditional overnight shifts and a block of casino shifts that were at least two consecutive days long during the study period. The traditional night shift studied was a 10pm-6am shift. The casino shift schedule studied included either a 4am-12pm or 8pm-4am. Baseline Biomarkers, that included white blood cell count, hemoglobin, platelets, and erythrocyte sedimentation rate (ESR) were collected at a minimum of 96 hours after any recent night shift work. These same biomarkers were again obtained at 4am on the last day of their series of night or casino shifts. Fitbit tracking of minutes of deep sleep were collected 1 day prior to first night shift until 48 hours after the final consecutive night shift. Additionally, the Stanford Sleepiness scale survey was completed within 1-hour post-shift for both traditional and casino nights. At the conclusion of the study, a 5-point satisfaction survey was completed, assessing participant preference between casino and traditional nights. Each subject served as their own comparator, facilitating individual and group data comparison.

Results: 12 EPs participated and were included in the analysis. Significantly lower mean white blood cell levels were observed during casino nights compared to traditional nights (6.77 vs 7.64, p=0.03) as well as between the baseline group compared to traditional nights (6.45 vs 7.64, p=0.004). Mean ESR levels were also significantly lower in the casino nights group compared to traditional nights (5.89 vs 8.7, p=0.03). Although not meeting the threshold for statistical significance, mean platelet count was also lower in both baseline and casino nights when compared to traditional nights (253 vs 250 vs 273, p=0.065). There was, however, no difference found in hemoglobin and hematocrit levels between groups. EPs were found to have an increase in minutes of deep sleep on casino nights in comparison to traditional, with participants averaging a 38% increase in deep sleep duration after their first night shift, increasing to a 62% mean increase after the second night shift. Although a lower Stanford Sleepiness Scale score was noted in the casino nights group versus traditional, statistical significance was not achieved (3.0 vs 3.7, p=0.08). Additionally, survey responses indicated increased satisfaction levels with casino nights scheduling.

Conclusion: In this investigation into the impact of casino nights versus traditional shifts, we observed a reduction in inflammatory marker levels during casino nights compared to traditional night shifts. Although increased satisfaction, increased deep sleep time and decreased sleepiness were not statistically significant, these findings may be clinically significant. A larger study is needed to better evaluate results of implementation of a casino schedule.

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155 A Case Study of How Alleviating "Pebbles in the Shoe" Can Improve Workflow Operations in the Emergency Department

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Background: Fixing "pebbles in the shoe" has been described by the American Medical Association to reduce physician burnout, by listening to team members and sorting the issues in terms of feasibility and priority to promote organizational change. A "pebble" problem is defined as a small, yet significant and frustrating issue in the workflow, but relatively easy to fix. By solving these frustrating "pebbles", leaders can make a large and positive impact in the workday. This process follows the principle of human-centered design, as a means to allow emergency physicians to play an active role in providing feedback about their work environment.

Study Objectives: To improve clinician well-being through a quality improvement project rooted in human-centered design, engaging clinicians by asking them what frustrates them in a workday, to improve workflow operations in a community emergency department (ED) affiliated with an academic institution. Outcome measures include characteristics of pebbles submitted (rate, feasibility, category of issue), number of pebbles that were fixed, and clinician's self-reported impact in personal well-being after participating in the project.

Methods: A "pebbles task force team" consisted of three emergency physicians and ED leadership (department chair, department administrator, nursing administrator, director of pediatric ED, director of supply). After education was provided to ED providers regarding the definition of a "pebble" problem, a baseline survey was sent to recall frustrations. Additionally, a QR code was created to collect real-time pebbles. The "pebbles task force team" meets bi-monthly to discuss the pebbles, categorize them, assign ownership of specific pebbles to be solved by members of the task force. Progress on the project was provided to the ED staff by a monthly "stop light" report. An anonymous survey of the impact on self-reported well-being was sent to the 68 ED providers in the department.

Results: Over a seven-month time frame, 284 pebbles have been submitted (~40 pebbles/month). Feasibility level of pebble: Green (completed) 149 (53%); Yellow (in process) 111 (39%); Red (not feasible, aka "boulder") 24 (8%). Category of pebbles: Equipment/Supply 115 (40%); IT/Technology 19 (7%); Nursing/Clinical 86 (30%); Process 64 (23%). Progress of pebbles: Complete 214 (75%); Incomplete 70 (25%). ED provider self-reported impact on personal well-being (n= 51, response rate 75%): Extremely Effective 16 (31%); Very Effective: 25 (49%); Moderately Effective 8 (16%); Slightly Effective 2 (4%). Lessons learned include the importance of departmental leadership buy-in, having QR codes easily accessible and plentiful at the clinical workstations, and closing the loop of communication regarding progress of project to stakeholders.

Conclusion: Working on well-being in the ED can be viewed on many levels, including working on personal resilience and improving the culture, but sometimes making your workday better is the key ingredient to combatting burnout. This project demonstrates a team of motivated physicians and leaders incorporating the clinician's voice to create a better clinical work environment and improved sense of well-being with minimal cost. The majority of pebbles submitted by our group were "green" and thus feasible in terms of fixing, with most relating to equipment. Unsurprising, the pebbles relating to other human-interactions (clinical/nursing and with consults in the ED) have been more difficult to work on. Having bi-monthly meetings with members held accountable to report back on their progress has made the ability to work on these issues much easier. This project can be easily replicated in different specialties of medicine and practice settings.

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ED Providers Winter 2024 Quarterly Progress on Pebbles in Shoe Project:

For any questions email diana.savitzky@nyulangone.org

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156 Recognition Matters: Increasing Community and Wellbeing Through a Faculty Development Committee

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Background: Emergency medicine groups often have faculty spread across multiple clinical sites, making it difficult to create a sense of community. Connectedness is a driver that increases motivation, collaboration, and engagement in the workplace which are essential for faculty retention. Recognizing accomplishments is one method to create community. This demonstrates appreciation of individual and group contributions and enables colleagues to learn more about each other.

Study Objective: A preexisting biannual survey revealed that individuals were feeling under-recognized, under-valued, and isolated. The faculty development committee strived to increase morale through a tripartite plan: connectedness, communication, and recognition. The purpose of this innovation was to increase the sense of community and wellbeing within our faculty.

Method: A biannual anonymous survey of the 56 faculty of a four-year EM training program with three clinical sites identified the need to improve a sense of community, appreciation, and belonging. The faculty development committee addressed three domains: *Connectedness:* Projects that help faculty get to know one another and align the group under a common purpose. *Communication:* A series of personal assessments and educational sessions to enhance interpersonal interactions and work satisfaction. *Recognition:* Initiatives that increase visibility of successes, both professional and personal, and facilitation of academic promotion.

Results: 1) Newsletters announce new team members, accomplishments, and upcoming events; 2) "Hall of Fame" posters include faculty spotlights, awards, and current publications; 3) Renewed departmental Mission and Vision Statement; 4) Faculty DiSC profiles and MBA Inventory assessments; 5) Book clubs on communication and leadership; 6) Kudos shared at monthly faculty meetings; 7) Congratulatory emails from the Chair; 8) Proactively identified those ready for academic promotion and awards.

Conclusion: The faculty development committee spearheaded initiatives within three domains: Connectedness, Communication and Recognition. Initiatives to increase intradepartmental recognition included a quarterly newsletter with faculty spotlights and presentations at the semi-annual faculty retreat. The departmental offices are in a high traffic area of the academic medical center. Updated faculty banners with photos, educational credentials, and job titles are prominently displayed. A biannual "Hall of Fame" poster highlights recent departmental publications, awards, promotions, biographies, and professional and personal accomplishments. Utilizing spaces in highly visible areas of the College of Medicine and hospital to increase recognition of our faculty and departmental achievements was well received by faculty, staff, students, and residents in all disciplines. A renewed departmental Mission and Vision statement unified faculty in purpose. Faculty retreats and meetings included discussion of faculty DiSC profiles, ways individuals feel appreciated at work, and book clubs on effective communication and leadership to enhance the work environment. Proactive identification of those ready for promotion by the RPT committee resulted in 33% of the faculty being promoted to associate or full professor over three years. Creation of a new awards committee resulted in over 200 nominations and 98 awards won by faculty, residents, APPs, and the department over 4 years. Biannual faculty survey demonstrated increased sense of gratitude, teamwork, and professional satisfaction across all three clinical sites. These initiatives resulted in the Department receiving the 2023 ACEP Wellness Center of Excellence Award.

No, authors do not have interests to disclose

157 Transitions: A Financial Wellness Education Pilot Curriculum for Emergency Medicine Residents

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Study Objectives: We designed a pilot curriculum to assess EM residents in their baseline financial-associated knowledge. We aimed to introduce basic financial terms and provide entry-level education for participants to provide them with a better grasp on protecting assets, life insurance, disability insurance, wills/trusts, college savings, student loan repayment, independent contracting, locum tenens, negotiation, budgeting, and investment strategies. A secondary objective was to encourage participants to take action to address their individual financial-related plans.

Methods: A one-day lecture-based pilot curriculum was developed after needs assessments were completed. Participants were surveyed using an anonymous mixed-method evaluation tool. The tool captured self-assessment of incoming knowledge on financial-related topics as well as knowledge increases. It also captured the participants' intent to take action, and specific actions planned. Simple descriptive statistics were used to analyze quantitative data. Free text answers were thematically analyzed by two independent coders, with discrepancies addressed via consensus.

Results: There were 32 respondents; highest incoming knowledge areas were loan repayment and budgeting (>60% with some or a lot of knowledge). Conversely, 75% or more participants had little or no knowledge in protecting assets, wills and trusts, independent contracting, locum tenens, and negotiation. Over 90% of participants learned something on each topic. 81% planned action as a result; themes include planning discussions with family, negotiation intent, and pursuing the procurement of disability insurance earlier.

Conclusion: This novel curriculum has provided an opportunity to support financial well-being amongst our trainees. The resulting evaluation survey suggests that EM residents have baseline knowledge in some financial areas, such as loan repayment and budgeting. However, other financial topics are not as well understood, such as college savings, wills and trusts, life insurance and investment strategies. Additionally, we found a need within our cohort for knowledge on topics pertinent to post-graduate careers in emergency medicine, such as independent contracting and locum tenens. More and more practicing emergency physicians participate in these types of employment structure; there is potential to further develop curricula on these topics that are becoming common in our field. Furthermore, our limited data suggests that the pilot curriculum was effective in addressing financial knowledge gaps, with over 90% of participants gaining knowledge in all topics. Perhaps more importantly, it also shows that the majority of participants (81%) will take some specific action based on their didactic experience. As residents attain a better understanding of their finances and make changes to their financial plan, it is possible that their financial well-being will improve. Previous studies have shown that an improvement in financial wellness can increase overall wellness. Additionally, a better understanding of one's financial situation has been shown to decrease life stressors in areas not related to finance. Residents with better financial literacy have been shown to have lower rates of burnout. Introducing a focused financial based education curriculum is a potential way for emergency medicine residency programs to promote wellbeing and combat burnout among resident physicians.

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158 Burnout Among Physician Assistants Practicing in Emergency Medicine: A National Cross-Sectional Analysis

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Background: The National Commission on Certification of Physician Assistants (NCCPA) reports that emergency medicine (EM) is the third most popular specialty for PAs. However, PAs in this field also report the highest percentage of experiencing at least one symptom of burnout. The COVID-19 pandemic has significantly increased the workload of healthcare professionals, particularly those on the front lines. This increase, especially in understaffed conditions, could potentially contribute to a rise in burnout. Despite these concerns, few studies have focused specifically on burnout and its correlates among PAs practicing in EM.

Methods: We performed a cross-sectional analysis using 2022 data from 13,214 board certified PAs practicing in EM, provided by the NCCPA. We assessed burnout using a validated single-item measure with a five-point response scale. A total of 12,683 PAs responded to the burnout question, yielding a response rate of 96%. For ease of interpretation, the response scale was dichotomized into 'no symptoms of burnout' and 'one or more symptoms.' We examined the following factors for their potential association with burnout: demographic characteristics (including age, gender, race/ethnicity, US region, rural-urban setting, armed forces service, and highest degree earned), practice characteristics (such as working in a secondary position, practice setting, number of patients seen per week, proportion of time spent in direct patient care, and whether the primary place of employment was recruiting/hiring PAs [proxy for being understaffed]), and job satisfaction. We plan to update these analyses using 2023 NCCPA data.

Results: Our findings show that nearly 40% of PAs in EM reported experiencing at least one symptom of burnout. The highest rates of burnout were observed among PAs who spent less than a quarter of their time on direct patient care (46.2%), those whose primary workplace was actively recruiting or hiring PAs (45.7%), and those working in a secondary role that did not involve patient care (45%). Among the lowest burnout rate was observed for PAs age 65 and over (24.7%), African American PAs (27.0%), and PAs satisfied with their positions (31.9%). In bivariate analyses, we detected significant differences on burnout by all variables except rural-urban setting and the proportion of time spent in direct patient care. When including all covariates in a multivariate logistic regression, we found the strongest independent factor associated with increased odds of burnout was the number of patients seen per week. PAs seeing 81-100 patients had 63% higher odds of burnout than those seeing 40 or fewer. Other factors associated with increased odds of burnout included the primary workplace recruiting or hiring PAs (47% higher odds), spending less than 25% of the time on direct patient care versus 75% or more (47% higher odds), and having a secondary non-clinical position (42% higher odds). Protective factors included being satisfied with their position, African American Race, older age, male sex, and Hispanic/Latino(a) ethnicity.

Conclusion: Our findings demonstrate that nearly 40% of PAs in the fast-paced and high-pressure EM work environment experienced at least one burnout symptom. High workload and potentially understaffed working conditions were two major factors associated with increased burnout among PAs in EM. Further longitudinal studies are needed to closely monitor the occurrence of burnout symptoms among PAs in EM.

No, authors do not have interests to disclose

159 A Multidisciplinary Discharge Huddle Improves Emergency Department and Hospital Throughput Measures Without Increased Readmissions in a Rural Emergency Department

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Study Objectives: Emergency department (ED) boarding is common and leads to increased rates of left without being seen (LWBS). It is endemic in the United States and is directly linked to hospital throughput. We developed a multidisciplinary discharge huddle the afternoon before discharge (T-1) to provide team awareness of future discharges, remove any barriers, and prepare for potential referrals and operative cases. We hypothesized this huddle would decrease hospital excess days and improve measures of ED boarding without an increase in 30-day readmissions.

Methods: Review of administrative data between November 1, 2023 and April 20, 2024 at a rural, tertiary care hospital. We routinely track hospital excess days (defined as actual LOS-geometric mean LOS), 30-day readmissions, ED LWBS (patients per day), ED left without treatment complete (LWTC- patients per day), boarder hours (defined as time from admission order to depart ED), boarder volume, total ED visits, door to floor time, door to admit decision, decision to admit to depart for floor, and total ED LOS. On January 31, 2024, we instituted a multidisciplinary team including providers, nursing, hospital administration, imaging, laboratory, nutrition, pharmacy, social work, care management, and utilization management to identify next day discharges. This T-1 huddle was conducted during mid-afternoon families to prepare, imaging or consult needs to be escalated and transportation to be scheduled. We analyzed data using Stata 14.0 (College Station, TX). T-test was used to compare the pre (November 1, 2023 to January 31, 2024) and post (February 1, 2024-April 20, 2024) periods. Excess days are reported monthly in aggregate and were analyzed using Chi-Square analysis. Excess days data are only reported between February 1, 2024 and March 31, 2024.

Results: Excess days decreased from 1,162 (95% CI 905, 1,419) to 703 (95% CI 313, 1,093) between the pre and post periods ($p=0.047$) without an increase in readmission rate (pre: 12.1%, post 11.8%; $p=0.08$). ED daily volume did not change (pre: 94; 95% CI 92, 97 vs. post: 97; 95% CI 94, 99; $p=0.22$). ED boarding hours decreased (pre: 246; 95% CI 219, 273 vs. post: 154; 95% CI 133, 175; $p<0.001$) without a change in boarder volume (pre: 26; 95% CI 25, 27 vs. post: 27; 95% CI 26, 29; $p<0.16$). Door to floor (in minutes) decreased (pre: 704; 95% CI 639, 769 vs. post: 486; 95% CI 444, 527; $p<0.001$) as did ED LOS for all patients (pre: 259; 95% CI 248, 270 vs. post: 24; 95% CI 232, 250; $p=0.01$). Door to admit decision did not change (pre: 242; 95% CI 232, 251 vs. post: 230; 95% CI 222, 240; $p=0.1$). LWBS decreased (pre: 1.4; 95% CI 1.05, 1.8; post: 0.76; 95% CI 0.47, 1.05; $p=0.007$) while LWTC remained the same (pre: 3.1; 95% CI 2.51, 3.67; post: 2.48; 95% CI 1.99, 2.98; $p=0.12$).

Conclusion: A T-1 multidisciplinary huddle was associated with decreased hospital excess days and improved ED throughput measures without an increase in 30-day readmissions.

No, authors do not have interests to disclose

160 Breath Actuated Nebulizers for Asthma and COPD: A Monte Carlo Simulation Illustrating Cost Savings and Length of Stay Reduction in the Emergency Department

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Study Objectives: Nebulized medications are a mainstay of treatment for many patients with respiratory diseases in the emergency department (ED). Breath-actuated nebulizers (BAN) deliver medication only during inspiration and prior studies have demonstrated increased efficacy for asthma and COPD patients compared to use of continuous nebulizers (CN). Previous literature also demonstrated decreased ED length of stay (LOS), fewer inpatient admissions, and clinical improvement in symptoms with BAN versus CN use. However, widespread adoption of BAN has been limited by its higher per-unit cost relative to CN. Our primary objective was to estimate the annual national net cost and ED bed-hour savings of switching to BAN for patients presenting to the ED with asthma or COPD exacerbation. Our secondary outcome was the estimated cost savings at the individual ED level.

Methods: We estimated the number of patients presenting to the ED with asthma and COPD exacerbation, the incidence of nebulizer therapy use, and the typical disposition proportions from publicly available datasets. We created a Monte Carlo model and ran 1,000 trials to determine the marginal cost of a BAN-first approach. We also modeled the total reduction in LOS and cost savings from decreased ED bed hours and averted inpatient admissions among eligible patients nationally and categorized by common annual ED visit volumes.

Results: Based on data from the National Hospital Ambulatory Medicare Care Survey, asthma exacerbations accounted for 4.6% of all pediatric ED visits, while asthma and COPD exacerbation accounted for 2.3% and 2.3% of adult ED visits annually. Across pediatric asthma, adult asthma, and COPD exacerbation, nebulizer therapy was used in 58%, 50%, and 32% of cases, respectively. A BAN-first strategy was estimated to cost an additional \$10.8M (±\$1.7M) in supply cost but could yield an ED LOS reduction of 453,000 (±893,000) bed-hours nationally. For EDs with annual visit volumes of 30,000, 80,000, and 120,000 patients, converting to BAN translated to net annual cost savings of \$303,131 (±\$114,641) with added \$2,400 (±\$360) supply cost, \$864,485 (±\$305,708) with \$6,500 (±\$960) supply cost, and \$1,404,788 (±\$496,766) with added \$10,508 (±1,600) supply cost, respectively.

Conclusion: Despite its higher per-unit cost, widespread adoption of BAN may yield significant cost savings due to reduced ED LOS and likelihood of admission.

Yes, authors have interests to disclose

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Lecturer/Speaker Roche Diagnostics
Disclosure: Lucia Health Guidelines
Consultant/Advisor Lucia Health Guidelines

161 Use of Wearable Data to Predict Emergency Department Revisits

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Study Objective: Return visits to the emergency department (ED) following a hospitalization are common and costly. Despite significant interest in strategies to decrease ED return visits and readmissions, few strategies have demonstrated sustained improvements in this domain. Wearable devices ("wearables") represent a potential mechanism to identify early deterioration across a wide group of patient populations, however, robust data demonstrating utility are lacking. We seek to test the hypothesis that the use of wearable data can accurately predict ED revisits and re-hospitalization following a hospital discharge within 90-days.

Methods: We conducted a multi-center retrospective observational trial using the All of Us data repository (v7). This large National Institutes of Health initiative contains over 400,000 patients who have agreed to provide access to hospital, genomic and wearable data. We included adult patients (at least 18 years old) who were admitted to the hospital from 2015-2021, survived their hospitalization, and had wearable data available. We excluded patients who wore their wearable device less than 80% of the time and those who did not survive their initial hospitalization. We developed a long short-term memory deep-learning model to predict ED revisits and readmission on a day-by-day basis for the first 90 days following hospital discharge. We included 21 clinical and demographic variables as well as data available from wearable devices (eg, steps per day, activity level, heart rate, etc). We trained the deep-learning model on various datasets, including missing data analyses in which we dropped values from the wearable devices. Data was split 80%/20% for training/testing cohorts for the model. Missing data analyses were completed by replacing variables in question with the global mean. Permutation feature importance was used to determine the most important predictive features with all input features. Results of the model are presented as sensitivity, specificity, positive predictive value (PPV) and area under the curve of the receiver operating characteristic curve (AUC). Descriptive statistics are provided as indicated. A p value < 0.05 was considered significant in all comparisons.

Results: We identified 612 patients who met inclusion criteria, of which 33 (5.4%) had an unplanned ED revisit and readmission within 90-days. Patients with an ED revisit and readmission were more likely to be older, male and had a greater comorbidity burden. The AUC of the predictive model for a daily prediction of ED revisit and readmission was 0.83 [IQR 0.745-0.873], a sensitivity of 0.801 [IQR 0.8 – 0.804], specificity of 0.86 [IQR 0.769 – 0.9], and PPV of 0.226 [IQR 0.16 - 0.319] in the testing dataset. When we dropped wearable data global, the AUC dropped to 0.533 [IQR 0.511-0.572] and the PPV decreased to 0.077 [0.037 - 0.098] The most important predictive features in our PFI analysis were (in descending order): steps per day, alkaline phosphatase, creatinine, length of stay, and number of fairly active minutes per day.

Conclusions: The addition of wearable data may improve prediction of ED revisit following a hospitalization. Prospective studies are needed to demonstrate how this may improve patient care and decrease ED revisits.

Yes, authors have interests to disclose
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162 Is There an Association Between Emergency Department Crowding and Emergency Medical Services Redirection?

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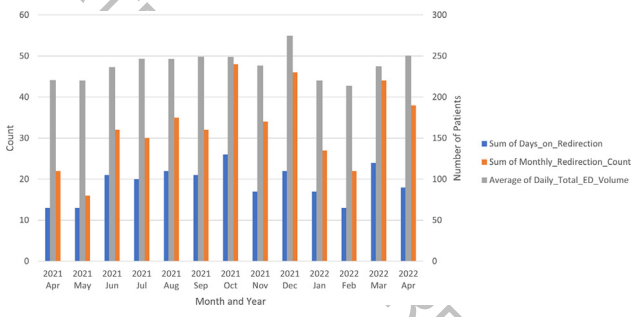
Background: Emergency Medical Systems (EMS) have developed policies to manage patient flow including diversion and redirection. Diversion is initiated in response to an inability to meet patient needs, often due to internal equipment issues or emergencies. Redirection is a more automated response triggered by the emergency command systems. Currently, gaps in the literature exist regarding the correlation between emergency department (ED) operational metrics and EMS redirection triggers.

Study Objective: This study analyzes the relationship between ED operational metrics and EMS redirection in an urban setting.

Methods: This single-center retrospective cohort analysis analyzed all EMS patient transports from April 2021 to May 2022 to an academic tertiary care center. Data on EMS redirection was obtained from Fire Department of New York (FIDNY) notifications, and ED operational metrics were collected from the hospital's data repository. Metrics included ED length of stay, admission rates, and times from door-to-triage and door-to-room, patients who left against medical advice and the boarding time. We used bivariate and multivariable logistic regression using parametric and none parametric tests to analyze the data. The multivariable logistic regression analysis was employed for all significant or near significant variables to adjust for their potential confounding effects.

Results: During the study period, there were 93,783 patient visits, of which 22,734 (24%) were transported by EMS. The mean [SD] number of daily visits was 239 [31]. There was no difference in ED volume in different months of this cohort (p=0.44). Of these, a mean [SD] of 57 [9] visits per day (24%) resulted in hospital admission. The ED's mean [SD] boarding time was 520 [208] minutes. The mean [SD] door-to-triage time was eight [4] minutes, and the mean [SD] door-to-room time was 18 minutes. The EMS command center activated redirection on 250 days within the study period. Monday (17%) was the most common day of the week for redirection occurrence ($p < 0.01$). There was no significant difference redirection occurrence per day or monthly in different months of the cohort (p= 0.46, and p=0.44 respectively) (Figure 1fig1). In the bivariate analysis, all indicators of ED crowdedness, except for the number of patients who left against medical advice and the boarding time, showed a significant correlation with the incidence of redirection. After adjusting for confounding in the multivariate logistic regression analysis, the only predictor of redirection was ED volume with an odds ratio of 1.02 ($p = 0.01$).

Conclusions: Our findings indicate no substantial correlation between these redirection practices and ED operational metrics. These results suggest a need for a paradigm shift toward more objective, data-driven measures to inform EMS redirection, ensuring decisions are grounded in the ED's actual operational capacity. This extensive use of redirection contrasted with our findings and raises questions about its application and whether it effectively serves its intended purpose of alleviating ED congestion. Despite achieving reasonable door-to-triage (eight minutes) and door-to-room times (18 minutes), our ED faced challenges with prolonged boarding times, averaging 520 minutes with downstream bottlenecks that would not have been resolved with redirection.



No, authors do not have interests to disclose

163 Track That Emergency Department Consult! Implementation and Validation of an Emergency Department Consult Tracking Tool to Monitor Consult Turnaround Times

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Background: Emergency department (ED) subspeciality consultations are an essential component to ED care and often greatly affect a patient's total ED length of stay. While there is anecdotal evidence that consultants take a prolonged time to provide recommendations, data corroborating these findings are rarely captured in a

manner reliable enough to provide an accurate measurement of this phenomenon. Surrogate markers for ED consultation turnaround times like first note signature do not accurately reflect when actionable recommendations were provided.

Study Objective: To evaluate consult turnaround times, we implemented a comprehensive consult tracking tool at our academic, tertiary care medical center in central Virginia utilizing our electronic health record (EHR, Epic Systems Vernona, WI). Time was recorded from when a consultation was ordered in the EHR to when it was documented that final consultant recommendations were communicated to the ED. Data was compiled to report mean, median, minimum, and maximum times for each consulting service.

Methods: Monthly data from an ED consults from December 2023 to February 2024 for 22 of our most frequently consulted services were retrieved and analyzed. Duplicate, cancelled, and erroneous consultations were removed, resulting in 5,401 discrete consult orders. A team of ED scribes manually verified each consult to determine the most accurate and earliest possible time that a consulting service's complete plan was communicated to the ED. If the implemented consult tracking tool was utilized, manual validation was completed to ensure that time stamp recorded was accurate. If the consult tracking tool was not utilized, then the scribes identified a surrogate time via a structured process in an effort to record the earliest time a plan could have been communicated, starting with ED documentation (ED Course), then turning to the disposition (Dispo) time, then the first instant the consultant signed their note (Note Signature). After completion of validation of each individual consult, turnaround times for each service were calculated and compiled into a scorecard.

Results: Of the 5,401 consults verified, 1,926 (35.7%) were tracked via the consult tracking tool, more than any other method utilized for validation. The remaining consults included 1,583 (29.3%) consultations that had a completion time noted by ED Course, 1,041 (19.3%) by Dispo, and 860 (15.9%) by Note Signature. The median turnaround time for consultations tracked with the tool was 139 minutes, by Dispo 179 minutes, - by ED Course 238 minutes, and 273 minutes when Note Signature was used as a surrogate marker for completion of the consult.

Conclusion: Utilization of a discrete consult tracking tool within the EHR resulted in data that were most representative of total consultation turnaround times when compared to other surrogate measures. These data indicate that manual tracking of ED consultation turnaround times via discrete documentation in the EHR is the most appropriate means to capture and reliably report out this information.

No, authors do not have interests to disclose

164 An Analysis of Different Specialists Performing Intubation in the Emergency Department

Maia IWA, e Silva LOJ, von Hellmann R, Hajjar LA, Scarpelli G, Ferraz T, de Alencar JCG, Guimarães HP, Mullan A, Bellolio F/University of São Paulo - Brazil; Mayo Clinic, Rochester, MN, Rochester, Minnesota, US

Study Objectives: Emergency medicine is a relatively new specialty in Brazil, with less than 10 years of establishment. Utilizing data from the Brazilian Airway Registry Cooperation Study (BARCO), this study provides a unique opportunity to evaluate the performance differences among specialists in a real-world setting. It aims to compare the success rates and incidence of complications following intubations performed by Emergency Medicine (EM) trained physicians versus physicians of other specialties.

Methods: This observational, prospective registry-based cohort study was conducted at 18 emergency departments across several regions of Brazil, including both academic and community centers. All emergency intubations performed on patients aged 18 years and older between March 2022 and April 2024 were included, excluding those during cardiac arrest. Data were collected 30 minutes after the conclusion of each procedure using a standardized REDCap survey completed by an observer involved in the procedure. Site investigators assessed outcomes at 28 days. Centers with a compliance rate of $\leq$ 80% for any given month had their data excluded from that month. Patients were grouped based on whether the first attempt was performed by an emergency physician or a physician from another specialty. The primary outcome was first-attempts success, and the secondary outcome was the occurrence of severe hypoxemia post-intubation. Adjustments were made for patient age, sex, Charlson comorbidity index, Sequential Organ Failure Assessment (SOFA) score, and physician years of experience to control for potential confounders.

Results: A total of 2,795 patients were included for analysis; 1,151 (41.2%) were intubated by an emergency physician, and 1,644 (58.8%) by a physician of another specialty (internal medicine represents 49% of the total sample). The odds of a first-attempt success were 60% greater when the intubation was performed by an emergency physician (78.8% vs 71.2%; OR = 1.60, 95% CI: 1.34 - 1.91, $p < 0.001$). After adjusting for patient age, sex, Charlson comorbidity index, SOFA score, and physician years of experience, the odds of a first-attempt success were 57% greater for emergency physicians compared to physicians of other specialties (OR = 1.57, 95% CI: 1.31 - 1.89, $p < 0.001$). Peri-intubation severe hypoxemia was less common when the procedure was performed by an emergency physician in both the unadjusted (OR = 0.67, 95% CI: 0.53 - 0.86, $p = 0.001$) and adjusted analyses (OR = 0.68, 95% CI: 0.53 - 0.88, $p = 0.002$). Emergency physicians used more video devices (23.3% vs 14.7%) and selected different medications for induction, with lower rates of fentanyl (11.3% vs 27.7%) or midazolam (1.7% vs 6.9%, respectively), and more likely to use etomidate (58.0 vs 54.1%), $P<0.001$.

Conclusion: This study highlights the advantages emergency physicians bring to emergency intubations. They achieved higher first-pass success rates and experienced lower incidences of peri-intubation severe hypoxemia. These findings support the role of emergency physicians, particularly in countries where the specialty is still emerging.

No, authors do not have interests to disclose

165 Ketamine vs Etomidate in Emergency Department Intubations: The Search for a Hemodynamically Neutral Agent

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Study Objectives: Although etomidate and ketamine are both considered hemodynamically stable induction agents for emergency intubation, the ongoing debate regarding which agent is more hemodynamically neutral persists. This study aims to evaluate whether the dosages and variables of etomidate and ketamine are independently associated with the incidence of post-intubation hypotension, thereby identifying the safest induction agent and dosage to reduce the risk of major adverse events and improve survival rates.

Methods: This observational, prospective cohort study was conducted across 18 emergency departments (EDs) in various regions of Brazil, including academic and community centers. The study included all emergency intubations performed on patients aged 18 years and older, excluding those during cardiac arrest, from March 2022 to April 2024. Data were collected via a standardized REDCap survey completed by an observer 30 minutes post-procedure. Principal investigators at each site accessed outcomes 28 days post-intubation. Centers with a compliance rate of $\leq$ 80% for any month were excluded for that period. Intubations facilitated with etomidate or ketamine were compared. Multivariable modeling was employed to determine if the drug dose in mg/kg of reported patient weight was independently associated with major adverse events (severe hypoxemia, hemodynamic instability, or cardiac arrest), adjusted for patient age, sex, SOFA score, Charlson comorbidity index, and number of intubation attempts. Adjusted odds ratios (aORs) with 95% confidence intervals (CIs) were calculated.

Results: We analyzed 1,599 intubations facilitated by etomidate and 719 by ketamine. The median drug doses were 0.27 mg/kg (IQR 0.22-0.31) for etomidate and 1.7 mg/kg (IQR 1.3-2.1) for ketamine. The median SOFA scores were similar between groups (4 [IQR 2-7] for ketamine vs. 4 [IQR 3-6] for etomidate, $p = 0.66$). Patients requiring vasopressor infusion prior to intubation were more common in the ketamine group (35.7% vs. 28.3%). The incidence of major adverse events was higher in the ketamine group (37.6%, 95% CI: 34.0-41.2%) compared to the etomidate group (30.6%, 95% CI: 28.4-33.0%, $p = 0.001$). New hemodynamic instability was more prevalent in the ketamine group (25.6% vs. 17.7%, $p < 0.001$). Rates of cardiac arrest were similar (3.1% for ketamine vs. 3.3% for etomidate, $p = 0.53$). In multivariable models, neither the dose of etomidate (aOR = 0.92, 95% CI: 0.82-1.04, $p = 0.32$) nor ketamine (aOR = 0.98, 95% CI: 0.86-1.13, $p = 0.84$) was associated with major adverse events. The 28-day mortality rates were not statistically different between the groups (44.8% for ketamine, 95% CI: 41.1-48.5%; 49.2% for etomidate, 95% CI: 46.7-51.6%, $p = 0.057$).

Conclusion: The incidence of major adverse events was higher in the ketamine group compared to the etomidate group. However, in multivariable models, neither the dose of etomidate nor ketamine was independently associated with major adverse events. This suggests that the choice of induction agent and its dosage may not be the sole determinants of post-intubation hypotension and other major adverse events. Therefore, while the debate on the more hemodynamically neutral agent persists, it is crucial to consider other patient-specific and pre-intubation factors such as age, sex, SOFA score, Charlson comorbidity index, and need for vasopressors prior to intubation when choosing an induction agent for emergency intubation.

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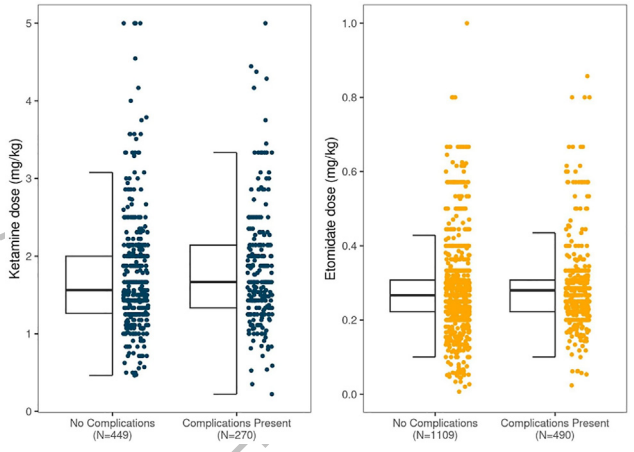

No, authors do not have interests to disclose

167 Patient Monitor Position and Operator Utilization During Endotracheal Intubation

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Study Objectives: Proper equipment setup is essential to ensure its effective utilization. There has been limited research on optimal equipment positioning during endotracheal intubation in any setting. The primary aim was to determine if patient monitor position affected its utilization and the operator experience during endotracheal intubation.

Methods: A randomized controlled trial of Emergency Medicine residents across two ACGME-accredited programs was performed. Subjects were asked to perform direct and video-assisted laryngoscopy a single time on a Deluxe Difficult Airway Trainer (Laerdel, Wappingers Falls, NY) in a simulated environment. Patient monitor position (head (H), left (L), right (R) of patient stretcher) was randomized prior to each attempt. Subjects were asked to complete a 5-question survey with responses graded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree): 1) I utilized the patient monitor effectively during the attempt, 2) I found it easy to visualize the patient monitor during the attempt, 3) I looked at the patient monitor at least once during the attempt, 4) I am confident that a desaturation event did not occur during the attempt, and 5) I am confident that a desaturation event did occur during the attempt. Differences in mean scores between groups were compared using an analysis of variance (ANOVA). Pairwise comparisons using two sample t-tests with Bonferroni correction were performed for statistically significant global comparisons using SAS v9.4 (SAS Institute Inc., Cary, NC).

Results: Sixty-eight intubation attempts were observed and included in analysis. Global ANOVA demonstrated significant differences in responses to questions 1, 2, 3, and 5. Pairwise comparisons demonstrated less effective utilization (H-L: -1.8, 95% CI: -2.6–0.9, $p<0.01$, H-R: -1.2, 95% CI: -2–0.3, $p<0.01$), reduced ease (H-L: -2.8, 95% CI: -3.2–1.7, $p<0.01$, H-R: -2.4, 95% CI: -3.2–1.7, $p<0.01$), decreased overall utilization (H-L: -2.1, 95% CI: -3.1–1.1, $p<0.01$, H-R: -2.0, 95% CI: -3- -1.1, $p<0.01$) and reduced confidence in recognition of a desaturation event (H-L: -1.1, 95% CI: -2–0.2, $p<0.01$, H-R: -1, 95% CI: -1.8–0.1, $p<0.01$) when the monitor was positioned at the head of the patient stretcher.

Conclusion: Traditional equipment setup with the patient monitor fixed at the head of the bed may reduce the ease and effectiveness of its utilization. Positioning the patient monitor within the operator's direct line of sight may optimize its utilization and improve the proceduralist experience during endotracheal intubation.

No, authors do not have interests to disclose

168 Evaluating AI-Powered Point-of-Care-Ultrasound Training for Estimating Gastric Volume for Pre-Intubation Assessment

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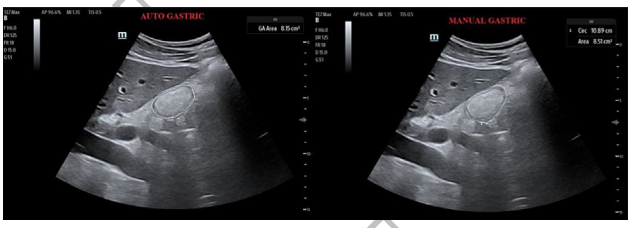
Study Objectives: Pulmonary aspiration remains a severe complication during airway management in patients within the emergency department and those with increased gastric volumes, such as those treated with semaglutide (Ozempic(R)) or with gastroparesis are at higher risk. These volumes can be assessed using ultrasound, and there are auto-measurement gastric tools which can help simplify this measurement. Our objective was to evaluate whether point-of-care ultrasound (POCUS) of the gastric antrum as a proxy for gastric volume can be feasibly taught to Emergency Medicine (EM) residents, and if one of these auto-tools is as accurate as manual measurements.

Methods: This was a pre-post study, conducted at two academic medical centers with two Accreditation Council for Graduate Medical Education-accredited categorical 3-year EM residency programs and a 5-year combined EM and pediatric residency program. All participants underwent a pre-survey consisting of gastric POCUS technique, and qualitative assessments of gastric POCUS images. Subsequently, participants received a short educational lecture on gastric POCUS. After 1 week, the participants had a 10-minute hands on assessment of gastric POCUS using human models. Participants were blinded to the human model who drank either 8 ounces of water ("fluid filled"), ate a snack ("mixed fluid/solid") or had an empty gastric antrum ("empty"). Participants utilized both manual tools and auto-gastric cross sectional area tools to measure gastric antrum which was timed for comparison. This was followed by a post-survey one month later to assess knowledge retention. Notably, the identical pre-test/post-test consisted of questions on gastric ultrasound images with demographic items included in the pre-test.

Results: A total of 62 participants completed the pre survey, with subsequent data collection of 57 participants (91.93%), with 46 completing the post-survey (74.19%). Of the participants in the hands-on gastric measurement, there were 17 PGY1 (29.83%), 17 PGY2 (29.83%), 16 PGY3 (28.07%), 3 PGY4 (5.26%), and 3 PGY5 (5.26%). The majority of participants had performed between 151-200 POCUS examinations during residency (36.84%), with 50 (80.65%) reporting they had never performed gastric POCUS and none (0%) having performed more than 2 previously. The pre-test group scored a mean of 33.9% (STD 25.6%). The post-test group scored a mean of 51.1% (STD 30.4%), with a mean difference of 21.3% that was statistically significant ($p=0.001$), 95% CI[8.90, 33.7]. The mean time to manual measurement of the gastric antrum was 20.14 seconds, with the auto-tool taking an average of 2 seconds. There was no statistically significant difference in mean measurements (8.618cm-2, and 7.542cm-2, respectively) with a $p=0.171$, 95% CI[0.480, 2.633].

Conclusion: Our study suggests that with a focused education resident physicians can learn how to perform gastric POCUS, and with moderate success, interpret the sonographic findings. The auto-tool not only was far quicker to utilize, but had similar measurements, implying that this tool may simplify and facilitate rapid risk stratification for aspiration during airway management. We conclude that rapid evaluation of gastric volume can potentially be utilized in every day practice with the availability of artificial intelligence or via brief educational supplementation in order to prevent any potential airway catastrophes.



No, authors do not have interests to disclose

169 Assessing Shock Index Variants as Predictors of Peri-Intubation Circulatory Collapse

Maia IWA, e Silva LOJ, Amat H, Barros D, Creste D, Teixeira R, Alencar JCG, Hajjar LA, Toledo de Freitas G, von Hellmann R, Bellolio F/University of São Paulo - Brazil; Mayo Clinic, Rochester, MN, Rochester, Minnesota, US

Study Objectives: Identifying patients at higher risk for circulatory collapse is crucial for guiding optimal pre-intubation optimization in the emergency department (ED). This study aims to evaluate the accuracy of the traditional shock index (SI) and its variants (age-adjusted SI and Modified SI) in predicting major hemodynamic events in patients intubated in the ED.

Methods: This observational, prospective cohort study was conducted in 18 emergency departments across several regions of Brazil, including both academic and

community centers. It included all emergency intubations performed on patients aged 18 years and older, excluding those during cardiac arrest. Major hemodynamic events, defined as the occurrence of cardiac arrest or new hemodynamic instability peri-intubation, were closely monitored. New hemodynamic instability was identified by a systolic arterial pressure ≤ 65 mmHg or the initiation of vasopressors post-intubation. Data were collected 30 minutes after each procedure using a standardized REDCap survey completed by an observer. Outcomes were accessed 28 days post-intubation by a principal investigator from each site. Enrollment occurred from March 2022 to April 2024. Centers with a compliance rate of ≤ 80% for any month had their data excluded for that month. The traditional Shock Index was calculated by dividing the heart rate by the systolic blood pressure. The Modified Shock Index and age-adjusted Shock Index were calculated by dividing the heart rate by the mean arterial pressure and by multiplying the traditional Shock Index by age, respectively. The optimal classification threshold for each index was determined using Youden's index and by requiring a minimum sensitivity of 80% to reduce false negatives.

Results: The study included 2758 patients (median age 63 [IQR 49-73], 42.0% female). Post-intubation hemodynamic instability or cardiac arrest occurred in 608 (22.0%) patients. The traditional SI had an AUC of 0.656 (95% CI: 0.632 - 0.680), with an optimal cut-off point of 0.81 (sensitivity 63.5%, specificity 59.1%); a sensitivity- focused cut-off was 0.69 (sensitivity 80.1%, specificity 41.5%). The Modified Shock Index showed an AUC of 0.659 (95% CI: 0.637 - 0.687), with an optimal threshold of 1.22 (sensitivity 51.1%, specificity 71.0%) and a sensitivity-oriented cut-off of 0.93 (sensitivity 80.0%, specificity 39.6%). The age-adjusted SI predicted complications with an AUC of 0.700 (95% CI: 0.677 - 0.722), optimal cut-off at 49 (sensitivity 67.8%, specificity 63.4%), and a minimum sensitivity cut-off at 40 (sensitivity 80.1%, specificity 45.5%). The SI range 0.7 - 1.0 had an adjusted OR of 2.10 (95% CI 1.65-2.66, $p < 0.001$); the MSI range 0.9 - 1.1 and ASI range 40-60 had adjusted ORs of 1.85 (95% CI 1.38-2.47, $p < 0.001$) and 1.98 (95% CI 1.53-2.56, $p < 0.001$), respectively.

Conclusion: Age-adjusted SI better predicted major hemodynamic events after intubation than traditional SI and MSI. Traditional SI had a lower cutoff in our sample compared to other studies. Age-adjusted SI can help clinicians more accurately recognize patients at higher risk of circulatory collapse after intubation.

Table 2: Association between shock indices and complications (hemodynamic instability or cardiac arrest) following intubation

		Unadjusted		Adjusted	
	Frequency of Complications	Odds Ratio (95% CI)	P-Value	Odds Ratio (95% CI)	P-Value
Shock index					
< 0.7	133/1054 (12.6%)	Reference		Reference	
0.7 - 1.0	234/1026 (22.8%)	2.05 (1.62, 2.58)	< 0.001	2.10 (1.65, 2.66)	< 0.001
1.0 - 1.3	143/443 (32.3%)	3.30 (2.52, 4.32)	< 0.001	3.21 (2.42, 4.25)	< 0.001
≥ 1.3	98/235 (41.7%)	4.95 (3.60, 6.80)	< 0.001	4.64 (3.32, 6.47)	< 0.001
Modified shock index					
< 0.9	107/889 (12.0%)	Reference		Reference	
0.9 - 1.1	118/580 (20.3%)	1.87 (1.40, 2.48)	< 0.001	1.85 (1.38, 2.47)	< 0.001
1.1 - 1.3	126/538 (23.4%)	2.24 (1.68, 2.97)	< 0.001	2.18 (1.63, 2.92)	< 0.001
≥ 1.3	257/751 (34.2%)	3.80 (2.96, 4.89)	< 0.001	3.51 (2.70, 4.56)	< 0.001
Age-adjusted shock index					
< 40	119/1077 (11.0%)	Reference		Reference	
40 - 60	202/932 (21.7%)	2.23 (1.74, 2.85)	< 0.001	1.98 (1.53, 2.56)	< 0.001
60 - 80	160/456 (35.1%)	4.35 (3.32, 5.70)	< 0.001	3.53 (2.65, 4.70)	< 0.001
≥ 80	127/293 (43.3%)	6.16 (4.57, 8.31)	< 0.001	4.53 (3.28, 6.25)	< 0.001

No, authors do not have interests to disclose

170 Interpretable Machine Learning to Enhance the HEART Score in Predicting Major Adverse Cardiac Events in Patients With Chest Pain in the Emergency Department

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Background: The HEART (History, Electrocardiogram [ECG], Age, Risk factors and Troponin) score is frequently employed in emergency departments (EDs) to risk stratify patients who present with undifferentiated chest pain. However, the risk of major adverse cardiac events (MACE) may be underestimated in patients with low HEART scores. We aimed to identify clinical features of patients who were initially classified as low risk by the HEART score but subsequently experienced MACE within six weeks. We then sought to enhance the HEART score by integrating these patient characteristics into an interpretable machine learning model.

Methods: We examined a multiethnic cohort of patients who presented with chest pain suspicious for acute coronary syndrome to EDs in the Netherlands and Singapore. Patients underwent risk stratification using the HEART score and were monitored for MACE over six weeks. We identified clinical characteristics of patients who developed MACE despite low HEART scores (0–3) using logistic and Cox regression models. Odds ratios (ORs), hazard ratios (HRs) and 95%-confidence intervals (95% CI) were calculated. These risk factors were then incorporated along with the HEART components into an interpretable machine learning-based automatic model using the AutoScore package in R software (version 4.1.2). Different models were constructed and the area under the receiving operator characteristic curve (AUC) was calculated for each model.

Results: Among 3,456 patients included in the study, 527 (15.2%) had MACE within six weeks. Males were more likely to develop MACE than females (OR 2.16, 95% CI 1.66-2.82). Within the low-HEART population (1,376 patients), male sex was independently associated with increased odds (OR 4.12, 95% CI 2.14–8.78) and hazards (HR 3.93, 95% CI 1.98–7.79) of developing MACE. The HEART score demonstrated an AUC of 0.771 (95% CI 0.749-0.792), while incorporating male sex yielded an AUC of 0.782 (95% CI 0.762-0.802) (Table). The AutoScore model utilizing HEART components yielded an AUC of 0.813 (95% CI 0.762-0.864). Incorporating sex into the AutoScore HEART model yielded an AUC of 0.839 (95% CI 0.795-0.883), a significant improvement over the original HEART score ($p=0.006$).

Conclusion: Male sex was disproportionately associated with MACE. Addition of sex to the HEART score and using an interpretable machine learning model can potentially enhance the performance of the HEART score.

		Original HEART Score	HEART Score with sex	AutoScore HEART	AutoScore HEART with sex
Model appearance					
History	Highly suspicious	2	2	21	18
	Moderately suspicious	1	1	11	9
	Slightly suspicious	0	0	0	0
ECG	Significant ST elevation	2	2	16	14
	Nonspecific repolarization	1	1	5	5
	Normal	0	0	0	0
Age	≥65 years	2	2	5	9
	>45 - <65 years	1	1	5	5
	≤45 years	0	0	0	0
Risk factors	≥ 3 risk factors or history of CAD	2	2	5	5
	1 or 2 risk factors	1	1	5	5
	No risk factors	0	0	0	0
Troponin	≥3 x normal limit	2	2	53	45
	>1 - <3 x normal limit	1	1	26	23
	≤ Normal limit	0	0	0	0
Sex	Male	-	2	-	9
	Female	-	0	-	0
AUC (95%CI)		0.771 (0.750-0.792)	0.782 (0.762-0.802)	0.813 (0.762-0.864)	0.839 (0.795-0.883)

No, authors do not have interests to disclose

171 Cardiovascular Risks Associated With Cannabis Use in Emergency Department Patients

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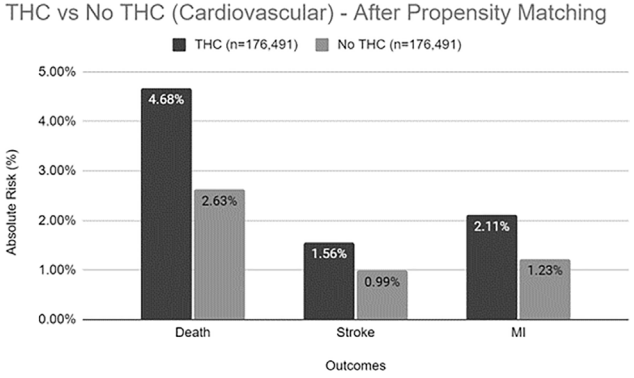
Background: Cannabis is one of the most commonly used psychoactive substances worldwide, with 14.4% of young adults in the US meeting the criteria for cannabis use disorder (CUD). This disorder is characterized by a loss of control over cannabis use despite adverse consequences. While cannabis is associated with various psychiatric syndromes, research on its potential to cause adverse cardiovascular events (CVD) has yielded mixed results. This study aims to investigate the relationship between cardiovascular outcomes and cannabis use in emergency department (ED) patients.

Methods: This was a retrospective, propensity matched study utilizing the TriNetX database to analyze records of patients from 61 healthcare organizations in the United States between the time period of Feb 2004 - Feb 2021. Cohorts consisted of adult patients and grouped based on diagnosis of "Cannabis Use, Uncomplicated" (CUD) within 5 years before or 1 month after an ED visit. A control group which included a history of pharyngitis, but no CUD diagnosis was created for propensity matching (control group with no CUD was too large for propensity matching). A sub-group analysis compared CUD patients with those diagnosed with "Alcohol Related Disorders" (ARD) and no CUD history. The outcomes evaluated were all-cause mortality, stroke, and myocardial infarction (MI) within 3 years after the ED visit. Patients who previously experienced these outcomes were excluded from the study. Propensity matching was performed for demographics and pre-existing medical conditions for the primary analysis and secondary analysis.

Results: There were 1,271,151 patients identified with ED visits with or without CUDs. After propensity matching, there were a total of 352,982 adult patients with CUD (n=176,491) within 5-years prior or 1-month after an ED visit or no history of CUD (n=176,491). Patients with CUD had a higher rate of mortality (4.68% vs 2.63%, RR 1.78, 95% CI 1.72-1.89, p<0.001), stroke (1.56% vs 0.99%, RR 1.58, 95% CI 1.49-1.68, p<0.001), and MI (2.11% vs 1.23%, RR 1.71, 95% CI 1.62-1.80, p<0.001) within 3-years of the ED visit compared to patients with no CU. For the secondary analysis, patients with CUD had lower rates of mortality (3.96% vs 4.62%, RR 0.86, 95% CI 0.83-0.89, p<0.001), but higher rates of stroke (1.42% vs 1.32%, RR 1.07, 95% CI 1.00-1.15, p=0.04), and MI (1.86% vs 1.60%, RR 1.16, 95% CI 1.10-1.24, p<0.001) within 3-years of the ED visit when compared to patients with ARD and no history of CUD after propensity matching.

Conclusion: The findings of this study showed that over the last 20 years, cannabis use was associated with higher risks of mortality, stroke, and MI for emergency department patients. This study further expands on current literature regarding the cardiovascular risks of cannabis use and can help to guide further policymaking and clinical decision-making in treating these patients.



No, authors do not have interests to disclose

172 A Prospective Trial of the Effect of Canadian Syncope Risk Score Recommendations on Emergency Physician Management of Unexplained Syncope

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Study Objective: The validated Canadian Syncope Risk Score (CSRS) has performed well in predicting 30-day adverse events in emergency department (ED) patients with syncope unexplained by a serious cause. The effect of CSRS-based management recommendations on community physician decision-making is unknown. We sought to evaluate physician response to CSRS-based decision support at 2 crossroads: disposition (home vs not) and, for home-going patients, adherence to 30-day event monitoring recommendations.

Methods: This prospective evaluation of clinician behavior was included in a validation study of the CSRS in 5 U.S. community EDs for patients ≥16y old. After determining that syncope was at that time unexplained by a serious cause, physicians accessed a web-based decision support tool, which helped calculate the CSRS and provided risk-based recommendations: Low-risk—at least 2h of continuous cardiac monitoring and, if reassuring, discharge home with primary care follow-up; home monitoring was not indicated. Medium- and high-risk—at least 6h of continuous monitoring, with 30-day event monitoring when suitable for discharge. Cardiology phone consultation was advised for high-risk patients. We identified physicians' intended disposition plan (home vs admission) by requiring they denote it prior to both the CSRS calculation and receipt of risk-based recommendations. We defined admission as admission to a short-term observation or inpatient unit. We measured change in disposition from intended to actual. For patients discharged directly home, we measured adherence to home monitoring recommendations. Outcomes were captured on manual chart review. We correlated reception of home monitoring with adjudicated 30-day serious arrhythmic outcomes (eg, sinus pause >3 seconds, sustained ventricular tachycardia), as used in CSRS research.

Results: In this 9-month interim analysis (03/01/22 to 11/30/22) of a 2+-year trial, 233 emergency physicians (<1% residents) denoted their intended disposition for 1,013 patients, 54.9% of whom were female, median age 68 years (interquartile range 54-82). After receiving decision support, physicians changed disposition for 145 patients (14.3%): the proportion intended for admission but discharged home (20.3%; 65/319) was higher than that intended for home care but admitted (11.5%; 80/694) (P<0.01). Change in disposition varied by risk strata (Table). Overall, 679 (67.0%) patients were discharged home, which decreased significantly with ascending risk strata (Table). Adherence to home monitoring recommendations was common (76.3%) but decreased with increasing risk strata (Table). Few home- going patients (n=7; 1.0%) developed a 30-day serious arrhythmic outcome: 6 (3.2%) among monitored and 1 (0.2%) among non-monitored patients (Table). Arrhythmic outcomes were detected in 3 low-risk patients discharged home with monitoring. No patients discharged home died <30 days.

Conclusion: In this multicenter prospective trial of decision support based on the CSRS, decision support informed changes in disposition in 1 in 7 patients. CSRS with risk-based recommendations more commonly led to reductions than escalations in disposition. Among patients discharged home, physicians often adhered to 30-day event monitoring recommendations. Home monitoring in select low-risk patients was serviceable in detecting rare arrhythmic outcomes. Forthcoming analysis of the full dataset will enhance our understanding of the impact of CSRS-based decision support on physician level-of-care decision-making and outcome detection.

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

Table. Effect of CSRS-based decision support (1) on change in disposition for the entire cohort and (2) on adherence to monitoring recommendations for home-going patients, with 30-day serious arrhythmia outcomes.

	Canadian Syncope Risk Class (Score Range) N=1,013		
Characteristic	**Low** (-3 to 0)	**Medium** (1 to 3)	**High** (4 to 11)
ALL PATIENTS	N=551 (54.4)*	N=343 (33.9)	N=119 (11.7)
Change in Disposition			
Downgraded from admission to discharge home	23 (4.2)	36 (10.5)	6 (5.0)
Upgraded from discharge home to admission	31 (5.6)	36 (10.5)	13 (10.9)
Sum	54 (9.8)	72 (21.0)	19 (15.9)
HOME-GOING PATIENTS	N=485 (71.4)	N=172 (25.3)	N=22 (3.2)
Physician Adherence to Monitoring Recommendations			
Adherent	408 (84.1) discharged without monitoring	101 (58.7) discharged with monitoring	9 (40.9) discharged with monitoring
Overruled	77 (15.9) discharged with monitoring	71 (41.3) discharged without monitoring	13 (59.1) discharged without monitoring
Serious Arrhythmia Outcomes within 30 Days			
With home monitoring, n/N	3/77	3/101	0/9
Without home monitoring, n/N	1/408	0/71	0/13
* n (column %) throughout except Serious Arrhythmia Outcomes (n/N)			

No, authors do not have interests to disclose

173 Radiation-Reducing Strategies in Antenatal Pulmonary Embolism Diagnostics: Differences in Testing Efficiency and Specialty-Specific Use Patterns

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Study Objectives: Pulmonary vascular (PV) imaging (ie, computed tomography pulmonary angiography and lung scintigraphy) during antenatal pulmonary embolism (PE) diagnostics exposes the pregnant patient and fetus to radiation with associated long-term malignancy risks. Two radiation-reducing strategies are available: (1) PE can be ruled in if compression ultrasonography (CUS) diagnoses deep vein thrombosis (DVT) in patients with symptoms suggestive of acute PE, allowing a presumptive PE diagnosis; (2) PE can be safely ruled out using validated D-dimer (DD)-based algorithms, eg, pregnancy-adapted YEARS and revised Geneva algorithms. To investigate contemporary practice, we compared prevalence and efficiencies of radiation-reducing strategies overall and by setting: emergency department (ED) vs obstetrics (OB), which included Labor and Delivery and OB clinics.

Methods: We undertook this retrospective cohort study across 21 U.S. community medical centers from 10/01/2021 through 3/31/2023. We included pregnant outpatient health plan members who underwent PE diagnostics with DD, CUS, or PV imaging. To focus on CUS as a rule-in strategy, CUS was included only if completed before PV imaging was ordered, if applicable. To identify physician intention, we included PV imaging that was pursued, which encompassed completed imaging and imaging that was intended but declined by the patient. We calculated the number needed to test (NNT) to forgo 1 PV imaging study by dividing the number of those tested by the number of those who were spared PV imaging. The safety outcome of DD-based rule-out strategies was the 90-day diagnostic failure rate, ie, the 90-day incidence of adjudicated venous thromboembolism (VTE), identified by automated and manual chart review.

Results: Among 679 outpatients undergoing diagnostic testing, 593 (87.3%) were evaluated in ED and 86 (12.7%) in OB settings. Median age was 30 years (interquartile range 26-34). Among 303 patients who underwent PV imaging, PE was diagnosed in 5 (1.7%). Overall, 214 (31.5%) underwent CUS, the prevalence of which was similar across settings: 31.2% of ED and 33.7% of OB patients. Patients with DVT symptoms underwent CUS in 50 of 58 (86.2%) ED and 15 of 15 (100%) OB patients (P=0.19). Those without DVT symptoms underwent CUS in 135 of 535 (25.2%) ED and 14 of 71 (19.7%) OB patients (P=0.31). Yield was low overall (0.9% [2/214]) and varied by DVT symptoms: 3.1% (2/65) with vs 0% (0/149) without (P=0.09). Both DVT patients with PE symptoms were spared PV imaging. CUS NNT was 107. Overall, 496 (73.0%) underwent DD testing, varying by trimester (84.2% [1st], 78.8% [2nd], 60.0% [3rd], P<0.001) and setting: 80.8% of ED and 19.8% of OB patients (P<0.001). Physicians documented which risk score was used in 20.8% (103/496) of DD-tested patients, with YEARS the most common (80.6% [83/103]). PV imaging was not pursued in 96.6% (143/148) of those with low (<0.5 mg/L) and 46.3% (76/164) with intermediate DD values (≥0.5<1.0 mg/L). DD NNT was 1.4. Index PE (including presumptive and PV imaging-confirmed PE) was more prevalent in patients with higher DD values: 0% (0/148) with low, 0% (0/164) with intermediate, and 3.3% (6/184) with high D-dimer values. No 90-day VTE or deaths occurred following PE rule-outs.

Conclusion: Radiation-reducing strategies were commonly used during antenatal PE diagnostics in this community health setting, with DD algorithms far more efficient than CUS (NNT 1.4 vs 107, respectively). Patterns of D-dimer use were significantly different between ED and OB settings. Opportunities exist in both specialties to improve use of evidence-based radiation-reducing strategies in antenatal PE diagnostics. Efficiencies could be improved by employing symptom-driven CUS and more comprehensive DD use across settings and trimesters.

No, authors do not have interests to disclose

174 Comparison of Large-Bore Mechanical Thrombectomy to Other Therapies for High-Risk Pulmonary Embolism Using Propensity-Score Matched Analysis of the FLAME Study

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Study Objectives: Mortality for high-risk pulmonary embolism (PE) patients remains high with in-hospital rates exceeding 25%. Results from the recent FLAME study of high-risk PE patients showed lower rates of in-hospital mortality and other adverse outcomes in patients treated with mechanical thrombectomy than in patients receiving other contemporary treatments, but disease severity and comorbidity differences make comparisons challenging. The objective of this study was to use propensity score matching (PSM) to obtain more comparable treatment cohorts for outcome comparisons.

Methods: The FLAME study (NCT04795167) evaluated outcomes in acute, high-risk PE patients treated with large-bore mechanical thrombectomy with the FlowTriever (FT) System (Inari Medical, Irvine CA) or other contemporary treatment options. All treatments were physician-selected. Mechanical thrombectomy patients were enrolled in the FT Arm, while those receiving any other therapy were enrolled in the Context Arm. Patients were followed through hospital discharge or 45 days, whichever was sooner. The primary endpoint was a composite of in-hospital adverse events: all-cause mortality (ACM), clinical deterioration, bailout to an alternate therapy, and major bleeding. PSM was performed by matching patients 1:1 from the FT and Context Arms on 2 disease severity variables: presence of advanced cardiogenic shock as assessed by the Society for Cardiovascular Angiography and Intervention (SCAI) shock stage (a supervariable of multiple clinical features of cardiogenic shock) and presence of centrally located thrombus. Logistic regression was then used to adjust for additional baseline differences.

Results: The FLAME study enrolled 115 patients, including 53 in the FT Arm and 61 in the Context Arm. Data for PSM were available in 106 patients, from which 38 matched pairs were identified (n=76, 72%). Context Arm treatments in the matched cohort included systemic thrombolytics (73.3%), anticoagulation alone (21.1%), and catheter-directed thrombolytics (5.3%). In the matched cohorts, the primary endpoint was met in 18.4% of FT Arm vs. 55.3% of Context Arm patients (Table, P=0.0017). ACM was 0% in the FT Arm vs. 18.4% in the Context Arm (P=0.0116). Bailout rates were 5.3% in the FT Arm vs. 28.9% in the Context Arm (P=0.0125). Logistic regression in the matched cohorts revealed that compared to Context Arm patients receiving other therapies, patients who received FT treatment were 86% less likely to meet the primary endpoint (OR=0.14; 95% CI=0.03-0.51; P=0.0050) and were 93% less likely to undergo bailout therapy (OR=0.07, 95% CI=0.00-0.43, P=0.0165).

Conclusion: After matching on shock status and thrombus location and adjusting for other covariates, high-risk PE patients treated with FlowTriever mechanical thrombectomy were 86% less likely (OR=0.14) to experience adverse clinical outcomes compared to patients who received a different treatment. These data suggest that large-bore thrombectomy is both safe and effective in high-risk PE patients, though additional evidence from randomized controlled trials is warranted.

TABLE: Outcomes in Propensity-score Matched Cohorts

OUTCOMES IN MATCHED COHORTS	FT ARM (n=38)	CONTEXT ARM (n=38)	P-VALUE
Primary endpoint	18.4%	55.3%	**0.0017**
All-cause mortality	0%	18.4%	**0.0116**
Clinical deterioration	15.8%	13.2%	1
Bailout	5.3%	28.9%	**0.0125**
Major Bleeding	10.5%	18.4%	0.5161
PRIMARY ENDPOINT LOGISTIC REGRESSION	**OR**	**95% CI**	**P-VALUE**
Treatment Arm (FT vs Context)	0.14	0.03-0.51	**0.0050**
SCAI shock stage D/E vs A/B/C	7.04	1.53-43.0	**0.0188**
Tachypnea (Y/N)	2.61	0.60-14.2	0.2215
Systemic Hypertension (Y/N)	8.73	1.70-70.5	**0.0196**
BAILOUT LOGISTIC REGRESSION	**OR**	**95% CI**	**P-VALUE**
Treatment Arm (FT vs Context)	0.07	0.00-0.43	**0.0165**
Tachypnea (Y/N)	1.13	0.21-8.72	0.8923

Variables were included in regression models if they were significant or confounders with other variables.

Yes, authors have interests to disclose
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Consultant/Advisor Inari Medical
Disclosure: Pfizer
Consultant/Advisor Pfizer
Disclosure: Bristol Myers Squibb
Lecturer/Speaker Bristol Myers Squibb

175 Cost-Effectiveness of Early Non-Invasive Cardiac Testing for Suspected Acute Coronary Syndrome

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Background: Early non-invasive cardiac testing (NIT) is often performed in the initial workup of patients who present to the emergency department (ED) with suspected acute coronary syndrome (ACS). We calculated the cost-effectiveness of adopting early NIT for risk stratification to avoid future nonfatal acute myocardial infarction (MI) or death.

Methods: To obtain the incremental difference in cost and clinical outcomes, we first conducted a multicenter retrospective cohort study within the member population of Kaiser Permanente Southern California integrated health care delivery system. We then adapted existing cost effectiveness models to generate long term costs and QALYs gained by NIT.

Results: The cohort included 89,387 patients (mean age 57 years, female 58%) and 19% received early NIT. Total cost was higher by $2,357 (95% CI $77 to $4,821) for early NIT compared to no early NIT and was mainly due to the increased cost of the index ED visit. Early NIT was associated with lower composite risk of death/non-fatal MI (absolute risk difference -3.7% (-4.4% to -3.01%)) during a 1-year follow-up. From a payor's perspective, early NIT was cost-effective at $5,268/QALY.

Conclusions: In patients suspected for ACS evaluated in the emergency department, incorporation of early NIT was associated with an overall increase in cost of healthcare that was driven by increased cost of the initial ED visit. However, due to the significant clinical benefits, early NIT was cost effective in the low and intermediate risk patients while it is a dominant strategy in high-risk patients saving cost and QALY's.

Yes, authors have interests to disclose

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Disclosure: Maros Ferencik has received research support from AHA and NIH and consulting fees from Siemens Healthineers, HeartFlow, and Elucid, and stock options from Elucid.

176 Effect of In-Person vs Virtual Interviews on Residency Interview Scores

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Study Objectives: Prior to the COVID-19 pandemic, virtual residency interviews were uncommon. Following the COPA recommendation to pursue virtual interviews, they have become ubiquitous. Residency programs continue to explore interview formats that allow applicants and programs to assess one another accurately and equitably. While previous studies are mixed on general satisfaction of virtual interviews, the financial and time commitment of in-person interviews cannot be overstated. During the 2023-2024 residency interview cycle, our program offered both an in-person and virtual interview option to applicants. The purpose of this study was to assess bias in applicant interview scores, to determine whether format impacted the evaluation process.

Methods: Data was collected retrospectively through ERAS and anonymized. Of the 125 applicants interviewed, 54 elected to interview in person, while 71 interviewed virtually. Baseline characteristics were analyzed for similarity between groups (virtual interviews vs. in-person). Step 2 CK scores were normally distributed and a two-sample t-test was used to assess similarity between groups. Percentage of median eSLOE scores > 2 were calculated and an odds ratio was obtained. Female/male, underrepresented in medicine, AOA membership, GHHS membership were compared using a chi-square test of independence. State of residence was categorized as Minnesota, Midwest, and other. These frequencies were compared using the chi-square test of independence. Given that baseline characteristics were similar between groups (aside from median eSLOEs and state of residence) we directly compared interview scores to minimize the potential for type 1 error as compared to matching techniques. A linear regression analysis was performed to assess associations between the above predictors and interview score.

Results: Assessed baseline characteristics were similar between groups other than median eSLOE scores and state of residence. Statistics and p-values are found in table 1. Linear regression accounted for 29.6% of the variance in interview scores (R2=0.296) indicating moderate explanatory power. There was a negative association between virtual interview format and interview scores (B= -0.6, $\rho = 0.045$) indicating that candidates interviewing virtually scored 0.6 points lower (on a 10 point scale) than their in person counterparts when adjusting for all of the other measured predictors. Conversely, eSLOE scores were positively associated with interview scores (B=1.8, $\rho < 0.01$). AOA membership was also positively associated with interview scores (B=0.7, $\rho = 0.035$). None of the other independent variables emerged as significant predictors of the interview score.

Conclusion: Our retrospective review demonstrated that candidates interviewing in-person received higher interview scores than their virtual counterparts. While there are many explanations for potential bias, we suspect superior personal connection and engagement of applicant and interviewers were contributing factors. Since the scoring system ultimately contributes to applicant ranking, it is critical to identify biases to have an equitable residency selection process. Further research is needed to examine whether this trend towards higher scoring for in-person interview candidates exists across multiple application cycles and at other residency programs with multiple interview formats.

Table 1: Baseline Characteristics

	In-person (n=54)	Virtual (n=71)	T/Odds ratio/Chi square statistic	P value
Step 2 CK score	245	249	T=-1.586	0.116
Median SLOE >2 frequency	27	52	OR=0.365	0.0091
F/M frequency	27/17	53/18	Chi square=0.393	0.531
Underrepresented minority/Non frequency	3	7	Chi square=0.366	0.817
AOA frequency	5	8	Chi square=0.005	0.954
GHHS frequency	9	9	Chi square=0.139	0.710
State of residence frequency (MN/ midwest/other)	48/6/0	36/22/13	Chi square=42.56	5.73*10^-10

No, authors do not have interests to disclose

177 Assessing the Effectiveness and Satisfaction of Teaching Huddles Among Emergency Medicine Residents

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Background: In response to the evolving educational demands in the field of emergency medicine (EM), we introduced the concept of teaching huddles in our emergency department (ED). Teaching huddles represent a forward-thinking approach to medical education, fostering collaborative learning environments. During these huddles, all learners in the ED gather with an attending physician for brief yet focused sessions to explore a topic of interest. This study aims to evaluate EM residents' perceptions of teaching huddles, focusing on effectiveness, satisfaction levels, and associated challenges.

Method: A survey employing a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was administered to EM residents (n=22, response rate: 95.6%) at the University of Toledo. Residents were asked to assess various aspects of the teaching huddles, including duration, impact on learning and team dynamics, engagement, relevance of topics, staff interruptions, and overall satisfaction.

Results: We found that the majority of respondents considered the duration of the huddles to be sufficient for effective teaching (mean score 3.6). Additionally, residents generally reported high relevance of the topics discussed to their clinical education, yielding a mean score of 3.8. Moreover, positive impacts on residents' understanding of clinical topics (mean score 3.9), clinical decision-making (mean score 3.6), and teamwork (mean score 3.6) were noted. Despite feeling actively engaged (mean score 3.5) and expressing a high level of comfort in asking questions or contributing during the huddle (mean score 4.3), staff interruptions were noted to disrupt the learning environment (mean score 4.1). Nonetheless, residents perceived relatively low adverse impact on patient care (mean score 2) and delays in routine tasks and urgent department needs (mean score 2.6). Overall, satisfaction with the teaching huddle concept was moderately positive, scoring a mean of 3.6.

Conclusion: Emergency medicine residents generally perceive teaching huddles as effective and relevant for clinical education, fostering engagement and teamwork. However, concerns were raised regarding staff interruptions, indicating areas for improvement in implementation and scheduling. Our findings offer valuable insights into the strengths and potential areas for improvement in the implementation of this concept in other EM residency programs.

No, authors do not have interests to disclose

178 A Pilot Program: Understanding of Social Determinants of Health Following Ride-Along With Mobile Integrated Healthcare Program

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Study Objectives: Mobile Integrated Healthcare (MIH) utilizes community paramedics (CPs) to promote continuity of care and linkage to care for patients lacking access to healthcare resources. CPs often increase access by addressing patient-specific social determinants of health (SDOH). The goal of this study was to determine if early clinical exposure and experience working with the MIH program to assist underserved patients could educate medical students on SDOH within their community, and the role SDOH play in accessing healthcare resources. This experience will also assess the effectiveness of MIH ride-alongs on medical students' clinical skills and clinical knowledge.

Methods: This IRB-approved cross-sectional study asked students to complete a pre-shift survey to assess their baseline knowledge of SDOH. The five overarching categories of SDOH included: 1) education quality and access, 2) healthcare quality and access, 3) economic stability, 4) neighborhood and built environment and 5) social and community context. Students were required to complete at least one eight-hour CP ride-along. Students were asked questions using a 5-point Likert scale, where 1 was "not at all informed" and 5 was "extremely informed". A post-shift survey reassessed knowledge of SDOH and documented students' perceptions on the educational value of the ride-along. Paired T-tests were utilized to assess differences in the mean score pre-test and post-test.

Results: Thirty-three medical students rode with the MIH program. The majority were white (72%), female (64%), with an average age of 26 (±3.84). Students were able to conduct home visits (93%), medication reconciliations (67%), chronic disease education (48%), lab draws (48%), and social and resource referrals (35%) during their ride-along. Nearly all (94%) reported that the MIH program improved their understanding of all five overarching SDOH categories and healthcare challenges within their community. Students were significantly more likely to assign greater impact on how the education access and social and community context could impact patients' health. Around 55% of the students endorsed that involvement with the MIH program improved their overall clinical skills and most (84%) agreed or strongly agreed that the experience improved their clinical knowledge. All but one student recommended permanent integration of MIH ride-alongs into the medical school curriculum.

Conclusion: Overall, working alongside community paramedics to care for underserved patients increased medical student knowledge SDOH and how SDOH impacts patients' healthcare. Most students reported improvement to their clinical knowledge and recommended integrating the MIH program as a permanent addition to the medical school curriculum. Medical educators should consider incorporation of MIH interactions to enhance real-world experience with SDOH.

No, authors do not have interests to disclose

179 Building a Ready Central Valley: Teaching Life-saving Skills and Increasing Awareness Around First Responder and Medical Careers in High School Students From Underserved Communities

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Study Objectives: Project R.I.S.E. (Ready in Situational Emergencies), in collaboration with the UCSF Fresno Emergency Medicine Department, was created to dually empower high school students in California's San Joaquin Valley (SJV) to explore medical and first responder careers and teach life- saving skills they can use at home and in their communities.

Background: Students from the agricultural communities of the SJV experience substantial healthcare and educational disparities. The SJV continues to be a healthcare desert with 47 providers per 100,000 residents and one Level 1 Trauma Center serving the 2.7 million people. As the healthcare needs of the region increase, while more medical providers and first responders leave the workforce, the SJV is predicted to experience a devastating impact on its healthcare system. In response, much of the focus in preventing such an impact is recruiting the next generation of healthcare and first responder professionals.

Methods: Project R.I.S.E. was hosted at Riverdale High School due to its large distance away from the nearest Level 1 Trauma Center and the educational and resource disparities of the community. One hundred and five high school Juniors participated in Project R.I.S.E. The event started with a 30-minute career panel. Participants then rotated in groups of 35 through three 30-minute, hands-on stations that focused on topics including fire safety, active shooter safety, and Narcan and CPR. Lastly, participants engaged in a tabling event to learn about the next steps in pursuing these careers. A post-event survey was distributed to gauge interest in future events.

Results: Of the 105 participants, 90.4% self-identified as Hispanic/Latinx, and 67% indicated their primary language at home was Spanish. In addition, 90.4% had $\geq$1 parent who worked in agricultural/blue-collar careers, and 8.5% had $\geq$1 parent who attended a 4-year university. Overall, after the event, 47.6% and 56.2% of participants indicated interest in becoming officially certified in Stop the Bleed and CPR, respectively. 98.1% of participants indicated interest in future career-exploring events.

Conclusion: Many young students in the under-resourced communities of the SJV lack exposure to healthcare and first responder careers. This reality provides direct obstacles in recruiting and retaining healthcare workers in these communities. Project R.I.S.E was developed with exposure and recruitment prioritized while providing an opportunity for students to learn life-saving skills they can use at home and in their communities. Based on survey results, Project R.I.S.E piqued an interest in students from a local high school to further explore life-saving interventions and careers in health care and first responding.

No, authors do not have interests to disclose

180 AI-Enhanced Spaced Repetition in Emergency Medicine Education

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Background: Spaced repetition is an evidence based memory technique that can help transform working memory into long-term memory. This memory technique can be implemented into a didactic curriculum. ChatGPT is OpenAI's Artificial

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Intelligence (AI)-powered chatbot language model. Since its launch in November 2022, countless applications for ChatGPT and AI have arisen in medical education. One area of interest is AI's ability to analyze and summarize input material such as papers and transcripts. Since the COVID-19 pandemic, the field of Emergency Medicine has seen an increase in virtual platforms offered for meetings and didactics. This virtual format has led to an increase in recorded lectures. This provides an opportunity to utilize AI to transcribe and summarize didactic lectures for future studying. This project evaluates the use of the AI advanced language model, ChatGPT, to supplement resident education through spaced repetition. It investigates the capacity of AI to analyze a didactic lecture, extract the essential concepts, and transform them into high yield questions and relevant teaching points. These AI-generated teaching points are then assessed for quality and distributed to the residents for weekly review.

Hypothesis: 1) Artificial Intelligence has the ability to analyze lectures and identify the critical teaching points and write questions based on these teaching points with a level of quality comparable to that of the original lecturer; 2) A curriculum utilizing spaced repetition of AI-generated teaching points will enhance the education of Emergency Medicine residents by promoting the long term memory of emergency medicine concepts.

Study Objectives: Investigate if AI can analyze a lecture, extract the essential concepts, and transform them into high-yield questions and relevant teaching points. 1) Compare the AI-generated teaching points to questions created by the lecturer; 2) Distribute questions and teaching points weekly for residents to review as part of a longitudinal curriculum based around the concept of spaced repetition; 3) Critically assess the impact of the AI-generated spaced repetition curriculum.

Methods: *Setting:* Emergency Medicine Residency Program Participants: Emergency Medicine Residents PGY 1-3

Design: There are four parts to this protocol. 1) Creation of teaching points: Conference videos were downloaded to mp4 format and input into AI technology (Riverside) to create a transcript which was uploaded into ChatGPT to read. A prompt was entered into ChatGPT asking it to create five teaching points and questions from the transcript; 2) Comparison of questions: A lecturer identified the five most important teaching points from their lecture and created five corresponding questions. The lecturer then reviewed the AI-generated questions corresponding to their lecture and assessed for correctness and relevance. The primary investigator randomly labeled the five questions from AI and five from the lecturer, #1-10. Two blinded adjudicators reviewed the ten questions and chose which five they believed to be AI generated and which five were the best questions. A kappa test was employed to assess for agreement between the two adjudicators; 3) Dissemination: A Google form with 10-20 AI-generated questions is created and emailed to residents weekly. Each form reviews didactic lecture topics from two weeks and three months prior. Responses are anonymously tracked to assess for completion; 4) Evaluation: A pre and post study survey of the residents will be completed to evaluate the impact of the weekly curriculum.

Results/Conclusion: This project is still ongoing and the results and conclusion are pending at this time. We believe this project will provide insight on the effectiveness of integrating AI into the emergency medicine residency curriculum, particularly through its capacity to facilitate spaced repetition of concepts.

No, authors do not have interests to disclose

181 Pre-Hospital Management of Heatstroke During a Heatwave in Phoenix, Arizona

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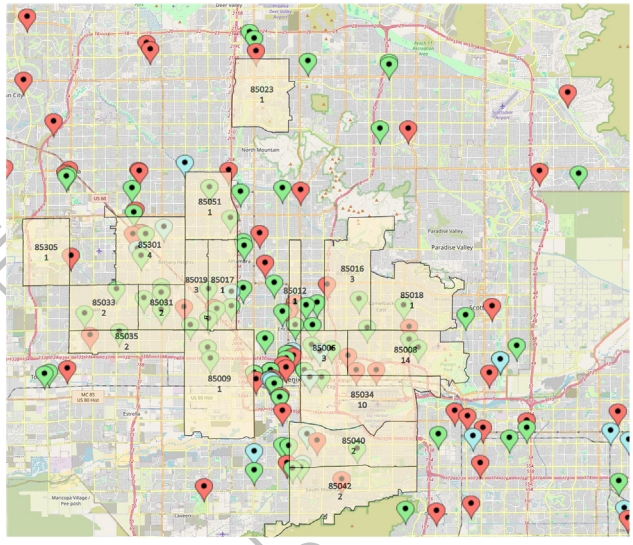
Study Objectives: The prevention and management of heatstroke is time-sensitive and often begins in the pre-hospital setting. Pre-hospital cooling is resource-intensive, challenging to implement, and variable in its application. The 2023 heatwave in Phoenix, Arizona, the longest and hottest in local recorded history, provides a unique opportunity to better describe pre-hospital management of heat associated illness presentations. The objective of this study is to describe the pre-hospital prevention and management of heat associated illness during the 2023 heat wave in Phoenix, Arizona.

Methods: This retrospective observational study of adult emergency department (ED) encounters with temperature (temp) $\geq$ 40.0°C, attributable to heat exposure, with central nervous system dysfunction occurring between June 1, 2023, and August 31, 2023, at single hospital system in the Phoenix, Arizona. Pre-hospital demographics and course were collected through chart extraction. A descriptive analysis was performed with confidence intervals where appropriate.

Results: Of 26,154 total ED encounters, 54 were determined to meet inclusion criteria. Heatstroke patients presented from 18 unique zip codes. Publicly available heatstroke prevention and cooling resources included a combination of cooling (18), hydration (37), and respite (8) centers. The pre-hospital patient location and geographically available cooling resources are described in Figure 1. Heat stroke patients presented by Emergency Medical Services (EMS) transport in 53 (98.2%) encounters. 32 (59.3%, 45.0-72.4% 95% CI) of the patients had documentation of EMS initiated pre-hospital cooling interventions. Cooling techniques included the use of or combination of cold intravenous fluids (18), placement of cold or ice packs (18), placement of wet towels (6), ice-bath immersion (3), cold blankets (2), and the use of fans (1). The average patient pre-hospital maximum temperature (Tmax) was 41.8°C (41.6-42.1°C 95% CI), Tmax at ED presentation was 41.8°C (41.4-42.0°C 95% CI) and post-cooling minimum temperature (Tmin) was 36.1°C (19.5-59.8°C 95% CI). 27 (51.0%, 37.6-64.2% 95% CI) of patients received naloxone prior to ED arrival. 7 (13.2%, 6.0-24.4% 95% CI) were intubated in the pre-hospital setting, and 10 (18.9%, 10.0-31.1% 95% CI) had pre-hospital cardiopulmonary arrest. Of the pre-hospital arrests, none were successfully resuscitated in the ED.

Conclusion: The pre-hospital management of heat stroke is logistically challenging. These encounters represent a high acuity patient population, often found outside in lower resourced areas, with a low rate of successful cardiopulmonary arrest resuscitation. Pre-hospital prevention and cooling therapies instituted prior to ED arrival is variable. There exists an opportunity to expand and standardize pre-hospital cooling approaches. Future assessments of pre-hospital hyperthermia therapeutics are needed.



No, authors do not have interests to disclose

182 Interfacility Transport by Private Vehicle Between Hospitals in a Rural Area Was Not Associated With Adverse Patient Outcomes

Day E, Breighner R, Flamm A/Wellspan York Hospital, Drexel University College of Medicine, York, Pennsylvania, US

Study Objectives: Patients are frequently transferred between hospitals to receive higher levels of care and specialty services. This is especially prevalent in community and rural hospitals where specialty care is not always readily available. Wait times for emergency medical service (EMS) interfacility transfers can often be delayed and can be associated with significant cost. Therefore, some patients are transferred via private vehicle. There is no current literature studying the safety of private vehicle interfacility transport (PVIFT) and published data consists mostly anecdotal evidence and case reports. The goal of this study was to determine the prevalence of adverse patient outcomes during or immediately after PVIFT within a single rural health system.

Methods: A retrospective chart review of a single major health system was performed. All instances of PVIFT are logged as a patient safety event in the health

system reporting database. Charts were obtained via query of this database for the time period of December 2020 through April 2024. Information obtained from the charts included demographics, vital signs, Glascow Coma Scale, health insurance status, private vehicle drivers, conditions at the sending/receiving hospitals, reasons for interfacility transport, reasons for not utilizing EMS transport, and complications during transport. We evaluated this information before and after PVIFT to identify potential decline in patient status. Additionally, hospital course at the receiving hospital was reviewed for any indication of decompensation or harm during interfacility transport. This information was tabulated in Excel (Microsoft, Washington, US). Descriptive statistical analysis was performed.

Results: Twenty-seven PVIFT cases were identified through the patient safety reporting system between hospitals within the health system. Patients were 48% were female, 48% male and 4% non-binary, 96% white, and 4% African American with a median age of 56 years (range 2- 86 years old). Insurance status comprised 15% Medicaid, 37% Medicare, and 44% private insurance with no insurance listed for the remaining 4%. Reasons for requesting private vehicle transport included EMS wait times, financial concerns, patient preference, and convenience. All PVIFT patients were stable at the time of depart from the sending hospital and none of the sending physicians felt inclined to complete AMA forms for this patient population. There were no cases of patient decompensation during transport or adverse outcomes related to PVIFT during the period studied.

Conclusion: Interfacility transport via private vehicles was a safe modality of transporting that was not associated with adverse patient outcomes in a small, clinically stable patient cohort at a rural single health system. Further prospective and multicenter study are required to determine the safety of private vehicle for interfacility transport across a range of practice settings.

No, authors do not have interests to disclose

183 Potential Impact of Direct to Waiting Room Triage on Ambulance Offload Delay

Wong-Rolle A, Vilke G, Franklin N, Childers R/University of California San Diego Health, La Jolla, California, US

Study Objectives: Ambulance offload delay (AOD) is a common problem nationally that reduces EMS availability. In October 2023 California passed Assembly Bill (AB) 40 requiring the state Emergency Medical Services Authority and local EMS agencies (LEMSA) to reduce excessive AOD. One method of minimizing AOD is to encourage transferring care from EMS directly to the waiting room (WR). In our LEMSA there exists an informal process for this direct offload, but a proposed policy using clinical criteria to formally identify low-risk patients for triage to the WR could further reduce AOD. The criteria proposed in our LEMSA are: age $\geq$ 18 or with a caregiver; normal mental status; normal vital signs (HR 60-100 bpm, RR 12-20 bpm, SBP $\geq$ 90 mmHg, SpO2 $\geq$ 94% RA); not suicidal/intoxicated/dangerous; ambulatory or mobile with wheelchair; no chest pain/syncope/acute neurological symptoms; and no ALS medications given or need for further monitoring. We sought to examine the potential for AOD reduction of implementing such a policy in our LEMSA, as well as the characteristics of the patients affected.

Methods: This was a retrospective review of patients transported by a single EMS agency between 1/01/2020 and 7/06/2023. We obtained encounter specific information including patient age, gender, vital signs, EMS primary impression, and destination hospital. We excluded patients who are generally offloaded immediately as the result of pre-alerting such as cardiac arrests, strokes, and STEMIs. We determined what percent of patients would meet direct to WR criteria based on our LEMSA's proposed policy. We then compared the mean AOD of patients meeting criteria for direct offload to the WR to those who did not. Lastly, we tested the effect of removing individual WR exclusion factors (eg, syncope, receiving certain medications, vital signs) from the proposed policy, and measured the number of additional patients that could be sent to the WR under these new conditions. AOD, demographics, and vital signs were compared using the independent samples T-test.

Results: The dataset included 24,172 patient records, of which 5,384 met direct to WR criteria (28.7%) based on our LEMSA's proposed policy. There was a small but statistically significant difference in mean AOD between patients meeting criteria for offload to the WR and those who did not (21.9 minutes versus 22.8 minutes, $p = 0.03$). Patients who met WR criteria were significantly older on average (57.8 years versus 53.0 years, $p < 0.001$). Of the alterations tested, removing Ondansetron administration (an ALS skill) as an exclusion factor increased the number of patients who would have met WR criteria from 5,384 (28.7%) to 5,961 (32.7%), based on the 3,434 patients who received Ondansetron. Broadening just the heart rate criterion to 50-100 bpm increased the number of patients meeting criteria to 5,604 (30.2%), while allowing a heart rate of 60-110 bpm increased the number to 6,044 (33.3%).

Conclusion: In this retrospective review of a single EMS agency dataset, about 29% of patients met the proposed criteria for direct offload to the WR. There are opportunities for a potential reduction in AOD if the formalized policy is successfully implemented, which is desirable given the recent efforts to address AOD by AB 40. Further criteria modifications could potentially increase the number of patients who could go to the WR.

No, authors do not have interests to disclose

184 Impact of Targeted Naloxone Distribution on Bystander Administration Prior to New Orleans EMS Calls

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Study Objectives: Since 2017, Louisiana has had a standing order authorizing naloxone access without a prescription and honored Good Samaritan drug overdose laws for bystander administration. Numerous long-standing community organizations distribute naloxone across the state, however the impact of such distribution on opioid overdoses have yet to be analyzed. In January 2022, the University Medical Center of New Orleans (UMCNO), New Orleans Health Department, New Orleans Fire Department, and New Orleans Emergency Medical Services (NOEMS), launched programs to increase availability of naloxone. These initiatives included NOEMS's Naloxone Leave-Behind Program, distribution of "Overdose Rescue Packs" to UMCNO patients upon discharge, and free pick-up of these packs at local fire stations. Concurrently, Tulane Street Health Clinic, a monthly pop-up clinic, began distributing naloxone to interested patients. This study utilizes NOEMS overdose call data to assess the efficacy of increasing naloxone access to patients who use drugs and impacted community members in New Orleans.

Methods: NOEMS calls involving naloxone administration by EMS, New Orleans Fire Department, New Orleans Police Department, and "Non-Medical Bystanders" were collected from January 2020 to June 2023. EMS calls were analyzed across Orleans Parish (county) and 4 downtown zip codes representing an area with direct coverage by the new naloxone programs (70112, 70113, 70116, 70130). Bystander to First Responder administration ratios were calculated per calendar quarter–the smallest unit of time where no single iteration resulted in zero bystander administrations. Further analyses were conducted for the downtown area to assess bystander administration per location type: Business/Store, Hotel/Motel, Public Building, Public Park, Residence, and Shelter/Temporary Housing. Statistical analyses utilized paired t-tests and odds ratios with a 95% confidence interval.

Results: After implementation of the targeted naloxone distribution programs, there was a significant positive shift in bystander administration both downtown ($p=0.007$) and across Orleans Parish ($p=0.008$) (Figure). The odds of bystander administration increased by a factor of 4.77 (95% CI: 2.91, 7.81) downtown and 1.96 (95% CI: 1.59, 2.41) for Orleans Parish. The downtown zip code with the highest percent bystander administration was 70112 (27), which houses UMCNO, a distributing fire station, and the Tulane Street Health Clinic. The downtown location types that had the greatest percent of bystander administration were Shelter/Temporary Housing (78), Public Building (39), and Business/Store (30).

Conclusion: These data indicate that greater and more targeted distribution of naloxone to patients who use drugs, as well as the community at large, is associated with increased naloxone use by bystanders to reverse opioid overdose prior to first responder arrival. As the pre-intervention mean was relatively stable, bystanders may not have been obtaining or using naloxone previously, despite the statewide standing order. Of note, not everyone who responds to an overdose with naloxone calls EMS, thus the number of calls and impact of bystander administration is likely an underestimate. Thus, healthcare organizations and medical institutions should support interventions that increase naloxone access and training for impacted community members, patients, and bystanders who serve as key mobilizers for improving opioid overdose outcomes.

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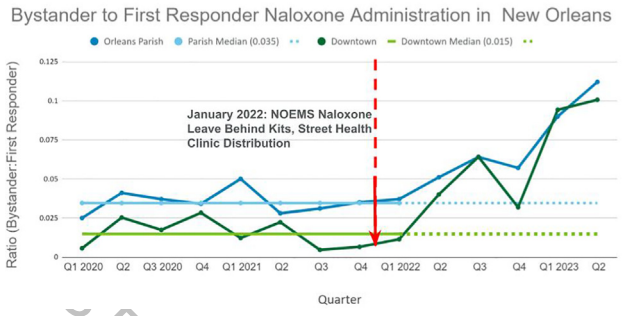

No, authors do not have interests to disclose

185 An Emergency Medical Services to Emergency Department Checklist for Handoff of Cardiac Arrest: A Modified Delphi Approach

McCann-Pineo M, Margius D, Shameem M, Li T, Weingart S, Rolston D, Becker L, Jafari D/Northwell Health, Manhasset, New York, US

Study Objectives: As part of an ongoing cardiac arrest (CA) video review quality improvement initiative, we found that the process of transferring prehospital information and care of CA patients to emergency department (ED) staff, known as a "handoff," is fraught with challenges. Improving communication of information during handoffs could improve patient care and outcomes. Checklists have been shown to improve efficacy of communication in handoff, but none have been developed specifically for CA. We aimed to develop one using a modified Delphi approach by a panel of experts.

Methods: Previously, we have reported the 17 most communicated items during CA handoff between Emergency Medical Services (EMS)-ED staff from audio and video recordings. To generate an expert-informed CA checklist using these items, we utilized a modified Delphi approach conducted among EMS and ED healthcare professionals. Experts were purposively identified as those who were known leaders in the fields of resuscitation, cardiac arrest, and prehospital medicine within and outside our health system and included ED (attendings, residents or Advanced Care Providers (ACP), and nurses) and EMS (Emergency Medical Technicians, Paramedics, Field Training and Operations), and clinician-scientist experts. Individuals were directly recruited via email, and were consented to complete two, iterative electronic surveys followed by participation in a one-time focus group. Participants were asked to rate the importance of each of the 17 items, the timing of when items should be communicated (ie, first, second, or third segment of handoff) and participant's basic demographic information. Aggregate results from the first survey were shared with all participants prior to the second survey. Checklist items and survey results were discussed amongst the expert panel to determine final inclusion of items during the 90-minute focus group session. Disagreements were discussed until a unanimous consensus was reached.

Results: Eleven experts were identified and recruited for participation via email. Ten were consented and completed the two surveys. Seven individuals participated in the focus group. Median years of experience was 10.5 years (Range: 2-35). Representation from the ED were: two senior nurses, one ACP, one Emergency Medicine resident, one attending physician, and one clinician-scientist. From EMS, two paramedics (one field supervisor) and two individuals from EMS leadership (medical and operations) participated. In iterative surveys, participants identified witnessed arrest, estimated downtime, and code status as the most important items to include on the checklist. Patient age, witnessed arrest, bystander Cardiopulmonary Resuscitation (CPR), estimated downtime, initial rhythm, and code status were identified as the items to be communicated within the first segment of EMS-ED handoff. After discussion, 13 items were finalized for checklist inclusion by the expert panel (Figure).

Conclusion: Through an iterative survey process and a focus group of experts, we have developed the first checklist specifically for handoff of CA patients from EMS to ED. We intend to implement this checklist in our clinical practice and to evaluate its feasibility and acceptability for use during CA handoff. Ultimately, we aim to perform a prospective randomized study across our health system to evaluate the impact of using this checklist on critical outcomes of CA patients in the ED, such as clinical team communication, improved time to defibrillation, and Extracorporeal Membrane Oxygenation candidacy.

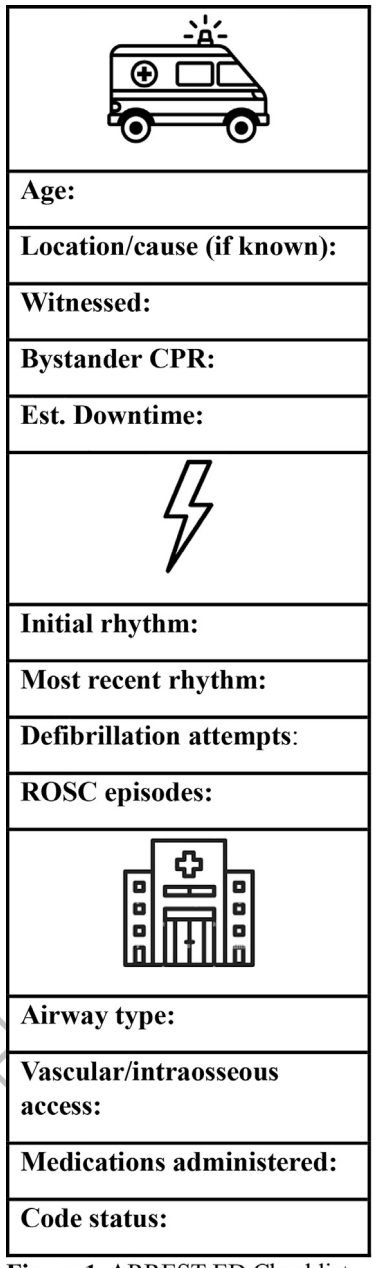

Figure 1. ARREST ED Checklist

No, authors do not have interests to disclose

186 Emergency Medical Service Clinicians' Perceptions and Utilization of Resources for People Experiencing Homelessness

Ly A, Mendoza M, Mansilla M, Mendoza C, Wenzel S, Gausche-Hill M, Arora S, Burner E, Abramson T/Keck School of Medicine of the University of Southern California, Los Angeles, California, US

Background: Rates of homelessness are rising nationwide and in Los Angeles County (LAC). Persons experiencing homelessness (PEH) utilize emergency medical services (EMS) at higher rates than housed individuals. In LA, the most common 911-EMS calls for PEH are for behavioral emergency, traumatic injury, and "no medical complaint." These calls are often of lower acuity and may be secondary to social needs and untreated, chronic medical conditions that may be better addressed by resources other than emergency departments. This qualitative study explores LAC EMS

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clinicians' perceptions and utilization of non-emergency resources to assist PEH with social, chronic health, or mental health needs.

Study Objective: To explore EMS clinicians' awareness and utilization of community resources that may benefit PEH in LAC, and issues that arise with utilizing such resources.

Methods: Semi-structured interviews of a convenience sample of 20 EMS clinicians working in LAC were conducted virtually via Zoom, audio recorded, and professionally transcribed. Interview transcripts were coded in Dedoose using an inductive and iterative approach. Inclusion criteria required that participants were at least 18 years of age; an active, licensed paramedic or EMT in LAC; and have responded to at least one 911-EMS call involved PEH in LAC in the past 18 months. The interview tool included probes about clinicians' perceptions of PEH, EMS resource utilization by PEH, challenges in care delivery, and alternate solutions needed to improve care for PEH. Basic demographics, level of training, and work experience of each participant were recorded.

Results: All participants were male with a mean age of 42.9 years and mean EMS experience of 15.5 years. They represented 11 different fire departments. 18 of 20 (90%) participants expressed frustration, helplessness, and/or burn out among colleagues or within themselves due to high volumes of PEH-related 911 calls and the homelessness crisis. Many clinicians refer patients experiencing homelessness to community resources, including psychiatric urgent care centers (45%), mobile homelessness response units (60%), and shelters or resource distribution centers (60%). Clinicians perceive issues with using community resources, including high demand for limited resources (25%), limited hours of non-EMS mobile response units (25%); lack of awareness of existing resources (20%); and lack of resources in different neighborhoods (10%). Some clinicians also believe that success stories and follow-up after referring PEH patients to community resources would boost EMS clinicians' job motivation and motivation to refer PEH to these resources (20%). On the mobile mental health crisis unit:

"But you're only allowed to have mental health issues, you know, Monday through Thursday from 8 AM to 4 PM... We need that 24 hours." - 43-year-old male, 15 years of EMS experience

On the need for non-hospital resources for lower-acuity complaints:

"[It's] overloading our hospitals ... patient offload times and all of that stuff is all… gonna keep compounding if we can't find other resources for low-level stuff." - 30 year-old male, 8 years of EMS experience

Conclusion: EMS clinicians expressed frustration in availability and accessibility of external resources to which they can refer PEH. Further exploration is necessary to determine what resources are needed in which areas of LAC, and how to optimize referral pathways. Future research will evaluate the impact of increasing reliable referral resources for PEH on EMS career burnout. Limitations include small sample size, self-selection bias, and generalizability.

No, authors do not have interests to disclose

187 The Impact of Geriatric Consultation on Admission Rates of Older ACO Patients From the Emergency Department: Implications for ACO Cost Savings

Meldon S, Hohman J, Saxena S, Block-Beach H, Marzulli J, Ortega C, Crowley C, Stuck A, Agha Z/Cleveland Clinic, Cleveland, Ohio, US

Study Objectives: Emergency departments (EDs) are frequently utilized by older patients, leading to correspondingly high admission rates in this population. Since hospital admissions are the largest driver of Accountable Care Organization (ACO) costs, we examined the impact of a geriatric consult program, in the ED or within an ED observation ('ED obs') unit on admission rates for attributed ACO ED patients.

Methods: Retrospective case control study in a busy academic level 1 geriatric ED, with 61,000 total annual visits and 25% geriatric (age $\geq$ 65 y) ED visits over a two-year period (1/1/2022-12/31/2023). Geriatric consults were available in the ED and in the ED obs unit for older patients (age $\geq$65 y) meeting predetermined high-risk criteria (ie, positive delirium screen, history of falls, dementia, polypharmacy, frequent ED visits, or provider concern). Admission rates for ED ACO patients are reported for the ACO patient cohort who received our intervention-a geriatric (Geri) consult and case management evaluation-versus the cohort of ACO patients who did not (no-Geri). Clinical data was abstracted from the electronic medical record and attributable costs from ACO claims records. Median Hierarchical Condition Categories (HCC) per patient are reported. Encounter level admission rates and median charges are reported, and cost savings estimated.

Results: ACO patients had a total of 5,328 ED encounters, representing 3,242 unique patients. Overall, 54% were female; 30% were Black and 67% White. In the Geri cohort, 62% were female and 50% were Black. Geri consult patients were older (median age 82y v 75y), and median HCC was slightly higher (5.03 v 4.94) compared to no-Geri patients. Hospital admission rates from the ED were 42% for Geri (218/519) and 56% (2667/4809) for no-Geri ($p<0.00001$). 464 ACO patient encounters were placed in ED obs unit. The hospital admission rate following ED obs was 18% (46/250) for the Geri cohort compared to 55% (117/214) for no-Geri ($p<0.00001$). Median charges per ED visit was higher in the Geri v no-Geri cohort ($2,328 v $1,663 in 2022; $2,646 v $1,910 in 2023) but mixed for the median ED obs charges ($5,324 v $6,535 in 2022; $5,699 v $4,468 in 2023; Geri v no-Geri, respectively). Median ED LOS was one-hour longer in the Geri group (6.2h v 5.3h 2022; 6.6h v 5.5h 2023). Median charges for a hospital admission for ACO-attributed patients during the study period was $16,898. Extrapolating the lower admission rates from Geri consults for ED ACO patients could potentially avoid 647 admissions over the two-year period. Averting even half of these could potentially save $5.47 million over a two-year period. Although ED obs ACO patient encounters were less frequent, ED obs utilization to obtain geriatric evaluations and decrease avoidable admissions, alone could potentially save $1.33 million over the same period.

Conclusions: In this single site study, admission rates for ACO patients receiving our intervention in the geriatric ED and ED obs unit were significantly lower than for those patients who did not receive geriatric and case management consultation. These results are similar to previously published results. Median ED and ED-obs charges were marginally higher in the Geri cohort, but much less than the median charges for hospitalization. This ED-based geriatric consult model may allow ACOs to reduce avoidable hospital admission rates in older ED patients, with significant potential ACO cost savings.

Yes, authors have interests to disclose

Disclosure: West Health Institute

Investigator

West Health Institute

188 Temporal Impact of Hospice and Palliative Medicine Consults on End-of-Life Outcomes in Emergency Department and Hospitalized Patients

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Study Objectives: In recent years, there has been growing recognition of the benefits associated with early engagement of hospice and palliative medicine (HPM) resources for patients nearing the end-of-life. Early access to primary and specialized palliative care, notably in the emergency department (ED) and inpatient settings, facilitates essential goals of care conversations, updates patients' code status preferences, and explores comfort care options while continuing disease targeted therapies. Despite the expanding evidence base supporting early HPM interventions, questions persist regarding the optimal timing and clinical setting of such consultations. This retrospective cohort study aims to address this gap by examining the outcomes associated with different timing intervals for HPM consultations, whether initiated in the ED, within the first 48 hours of an inpatient stay, or after 48 hours of hospitalization.

Methods: We conducted a multicenter retrospective cohort study using electronic health records from five hospital based EDs within a large urban and suburban metropolitan health system. The study period ranged from January 1, 2018, to December 31, 2022, and included patients aged >18 years who had HPM consults ordered during ED or inpatient encounters. Patients were categorized into three cohorts: those who had HPM consults ordered in the ED, within the first 48 hours of admission (early), and after 48 hours of hospitalization (late). Patient data collected included demographics, inpatient hospital length of stay (LOS), ICU LOS, inpatient mortality, and final hospital dispositions. In cases where patients received multiple HPM consults per encounter, cohort assignment was determined based on the timing of their earliest HPM consult order. The three cohorts underwent an analysis of variance (ANOVA) to assess baseline and outcome differences among the groups. Descriptive statistics were employed to offer a synopsis of the characteristics and outcomes within each cohort.

Results: The study analyzed 45,710 HPM consultations involving 25,609 unique patients across 31,072 encounters. Consultation distribution varied, with 6,220 initiated in the ED, 12,162 within 48 hours of hospitalization, and 12,690 after 48 hours of hospitalization. The mean age of the ED cohort was 77.7 years old (SD=13.88), statistically older than both the early (74.99, SD=14.86)) and late (74.36, SD=13.93) HPM consult groups ($p < .001$). The mean ED emergency severity index (ESI) was identical for all three groups at 2.12, $p = 0.55$. We observed significant associations between consult timing and various outcomes, including ICU length of stay, total hospital length of stay, and mortality rates in both ED and inpatient settings. For ICU length of stay, ED consults averaged 0.82 days, early inpatient consults 1.39 days, and

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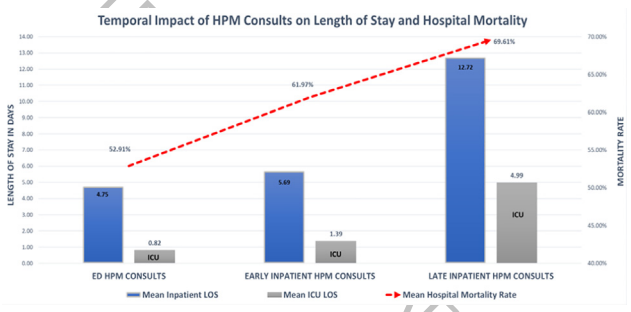
late inpatient consults 4.99 days ($p < .001$). Similarly, for total hospital length of stay, ED consults averaged 4.75 days, early inpatient consults 5.69 days, and late inpatient consults 12.72 days ($p < .001$). Additionally, mortality rates varied across consult timings, with ED consults experiencing a mortality rate of 52.91% (n=3291), early inpatient consults 61.97% (n=7537), and late inpatient consults 69.61% (n=8833) ($p < .001$). Graphical summary of these comparisons is displayed in Figure 1.

Conclusion: Our findings provide valuable preliminary insights into the temporal dynamics of HPM consultations in end-of-life hospital care. Early consultations, especially those initiated in the ED, were linked to shorter ICU and total hospital length of stay, as well as lower mortality rates. To advance these findings into practice, further efforts are needed to enhance primary palliative care skills among clinical teams and prioritize initiatives that enable early HPM consults in both the ED and inpatient setting.



No, authors do not have interests to disclose

189 Initiation of Early Palliative Care and Hospice From the Emergency Department

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Study Objectives: Palliative care in the emergency department (ED) has recurrently demonstrated several benefits including improved quality of life scores, decreased hospital length of stay and increased hospice utilization. The ED is a crucial location for identifying unmet palliative care needs and providing timely palliative care in rapidly declining patients with serious illness. In our current healthcare environment with an increase in patient census and an aging, more critically ill patient population, this intervention can be of utmost importance to delivering high quality, patient-centered care. Earlier initiation of palliative care and hospice from the ED has proven to enhance overall quality of care, hospital resource utilization, and patient/family experience at the end of life. The goal of this project was to increase the early recognition and referral of appropriate patients seeking Emergency care who would potentially benefit from palliative care services, in particular, 1) increase palliative care consultation and 2) enhance the transition to hospice care. The aim was to increase hospice transitions by 50% over a 1-year period (from March 1, 2023 through March 1, 2024) in admitted patients.

Methods: The was a quality improvement initiative using PDSA methodology and run charts. The setting is a large urban academic medical center that treats over 110,000 patients annually within the ED with an overall admission rate of approximately 30%. A group of key stakeholders including Emergency Medicine, Palliative, Social Work as well as our hospice liaisons was engaged to review our existent policies and workflow for hospice admission. Revisions and updates to palliative care policies and processes were next educated to multi-disciplinary provider teams via faculty meetings, resident conferences, high reliability organization staff huddles, department-wide emails and published hospital policies. Ongoing reinforced education has taken place by quarterly case-based in-situ simulations in the ED, utilizing standardized patients as health care proxies and manikins as patients. Multi-disciplinary stakeholder meetings were put in place to expedite the placement of patients into semi-private admission for hospice transitions as well. In order to assess the impact of our interventions, the process measure of Palliative Care consultation from the ED was tracked in addition to the outcome measure of disposition to hospice from ED admission. Descriptive statistics were applied to the data in pre and post intervention time periods as well as monitored over time. Statistics were performed using Excel with run charts and independent t-tests and non-parametric Mann-Whitney U Tests were applied.

Results: There were 38 versus 47 palliative care consults per month pre and post-intervention respectively ($p = 0.03$). Regarding learner comfort with palliative care in the ED, 47.6% of learners were comfortable in the ED pre-in situ simulation compared to 86% post-in situ simulation. Overall, there was a 33% increase in 7-day hospice transitions ($p=0.02$) in the post intervention period.

Conclusion: A focused, interdisciplinary quality improvement team and methodology can enhance palliative care initiation in the ED. Early palliative care consultation in the emergency department and clear workflows with engaged partners can change the course of inpatients as it relates to hospice transitions.

No, authors do not have interests to disclose

190 ISAR Screening: Implications for Older Patients Seen in the Emergency Department for Fall and Injuries

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Study Objectives: Emergency department (ED) visits by older adults are increasing and falls are the leading cause of traumatic injury among this patient population. The Identification of Seniors At Risk (ISAR) 6-item screening questionnaire tool has been used to identify older adults at significant risk for functional decline and use of resources. We sought to assess the ISAR tool for older adults seen in the ED for an acute fall and traumatic injury. We hypothesized that patients with a positive ISAR screen (score 2 or greater) would have higher rates of index admission, readmission, and death compared to those with a negative ISAR screen (score of 0 or 1).

Methods: We conducted a prospective multi-center study in 2 EDs (urban County level 1 trauma center and academic quaternary medical center with geriatric accredited ED, combined annual census 95,000). ISAR screening data were prospectively collected at triage for all older adult patients (65 years of age or older) from April 1, 2017, through September 30, 2023. Eligible patients were defined as patients 65 years of age or older who presented to the ED with a primary diagnosis of fall or fall-related injury by ICD 10 codes who had a valid ISAR score and a Emergency Severity Index (ESI) of 2-4. In addition to ISAR data, we collected baseline demographic, comorbidity, and disposition information; as well as 90-day follow-up including repeat ED visits, admission, readmission, and mortality data. Demographics and outcomes were compared between those with and without a positive ISAR score using a chi square test, p-values <0.05 are considered statistically significant.

Results: Over the 78-month study period, there were 44,029 ED visits from older adults for falls or fall-related injury by 10,906 individual seniors. A total of 5,124 (47.0%) of these patients had an index visit that met the inclusion criteria. In terms of disposition on index visit, patients with a positive ISAR were more likely to get admitted than negative ISAR (25.6% vs 15.1%, respectively, $p<0.001$). ISAR positive patients had higher rates of ED revisits at 90 days (29.0% vs 15.9%, respectively, $p<0.001$), as well as admission on a 90-day return visit (15.3% vs. 5.6%, respectively, $p<0.001$) and a higher 90-day mortality rates compared with negative ISAR patients (6.3% vs 1.2%, respectively, $p<0.001$).

Conclusion: In this study, older adults seen in the ED for falls or fall-related injuries, a positive ISAR score indicated greater risk for admission on index visit, repeat ED visit within 90 days, risk for admission or readmission within 90 days, and higher mortality.

No, authors do not have interests to disclose

191 Laboratory Testing May Benefit Older but Not Younger Emergency Department Psychiatric Patients

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Study Objectives: Previous studies have shown that routine laboratory testing has low yield for identifying unsuspected medical conditions for most emergency department (ED) patients who present for psychiatric problems. However, older psychiatric patients are more likely to have underlying medical conditions which can be associated with their psychiatric problems. (The medical problems may exacerbate the psychiatric conditions and the psychiatric conditions may interfere with treatment of the medical problems.) Our objective was to determine the effect of age on the frequency of finding clinically significant medical conditions in psychiatric patients. We did this by examining the percentage of ED patients by decade of life initially evaluated for psychiatric conditions who are subsequently admitted for medical illnesses.

Methods: *Design:* Retrospective cohort. *Population:* Consecutive ED patients presenting with psychiatric conditions in the years 2019-2021. *Setting:* Suburban ED with an annual ED volume of 90,000 patients, an ED residency, and a separate area for psychiatric patients. This area has specialized psychiatric personnel, including psychiatric social workers and psychiatrists. ED healthcare providers initially evaluate the patients and then request psychiatric consultation. The consultants frequently request completion of a

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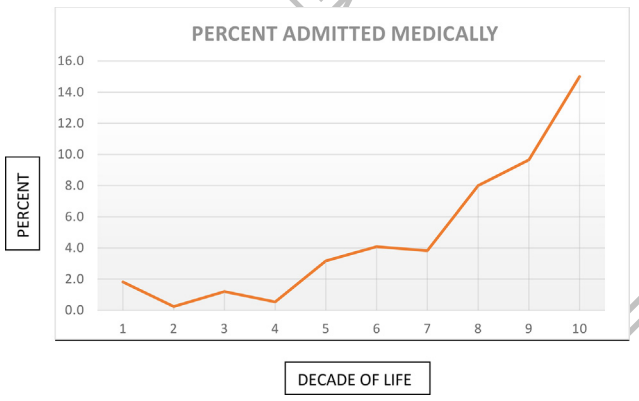
standard panel of laboratory tests (including hematology and chemistry tests and drug screens) before the consultation, and this panel is always required before hospital admission. The decision to admit medically rather than psychiatrically is often prompted by finding abnormal results on laboratory testing. *Protocol:* A database of ED psychiatric patients is maintained by the hospital. We tallied the number of psychiatric visits and the number of these patients admitted for medical conditions. We calculated and plotted the percent admitted medically by decade of life. We also tallied admissions for specific conditions, namely drug-related diagnoses (including alcohol abuse).

Results: The database contained 8,018 patients. The median age was 30 years (interquartile range: 19-51); 51% were female. Of these, 175 (2.2%) were admitted for medical conditions. The percent admitted medically varied markedly by decade of life, ranging from an average of < 1% in the first four decades of life to 15% in the tenth decade (See Figure). Drug-related diagnoses were found in patients admitted medically in the third through eighth decades of life, and accounted for 46% of the medical admissions in the fourth-sixth decades of life.

Conclusion: We found a low admission rate for medical conditions in the first four decades of life, confirming that these patients usually do not need routine laboratory testing before psychiatric admission. However, a significant fraction of older psychiatric patients is admitted medically, suggesting that routine laboratory testing should be considered for this population.



No, authors do not have interests to disclose

192 Sex Specific Differences in Emergency Department Patient Mortality Predictors and Documentation of End-of-Life Goals of Treatment

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Study Objectives: The NIH strategic plan for 2021-25 includes directives to supporting studies that promote health equity and reduce health disparities. Previously data has illustrated that there are gaps in documentation of advanced care directives and goals of treatment in emergency department (ED) patient electronic medical records (EMR). We set out to compare sex specific outcomes in EMR documentation of advanced care planning for high-risk patients and compare the mortality predictors between male and female patients.

Methods: This prospective cohort study was performed after IRB approval at 9 network hospital sites across NE PA (5 rural and 4 urban/suburban, including a level 1 trauma center). Collectively they have an ED census of 258,062. Over a 6-month period, a convenience sample of adult ED patients were included if they had a high mortality predicted by an End of Life (EOL) Deterioration Index guided electronic best practice advisory (BPA) or admission to any of the network intensive care units (medical, surgical, neuro, or trauma). EMR abstraction was used to evaluate if a healthcare power of attorney (POA) was identified, if living will documents were on file, if advanced care planning status was documented, and/or if a physician order for life-sustaining treatment (POLST) were present. Frequencies and percentages were used to report findings and comparisons between sexes reported (significance set at p-value less than 0.05).

Results: Included were 9,321 patient encounters (representing 7,204 unique patients); 53.8% (N= 3,874) were male and 46.2% (N=3,328) were female. Males had an average age of 70 years and females had an average age of 73 years. The mean End of Life Index (high risk ≥30) was 37 for females, and 38 for males. High risk factors for males and females (EOL Index and ICU stay) were similar between males and females. Greater than 70% of male and female patients had an absence of any of the following documents in their EMR: healthcare POA listing, living will documents, advanced directives, or POLST. Females had a higher percentage of documentation in the EMR across all variables of goals of treatment; the majority of these differences met statistical significance (Table).

Conclusions: There are large gaps in documenting advanced care directives and goals of treatments in ED patients. In our study, while there were minor differences in the sex specific risk factors indicating the necessity of a goals of treatment conversation, females were significantly more likely to have documentation including their healthcare power of attorney, advanced directive, and physician orders for life-sustaining treatment (POLST). In an effort to provide equitable care, early determination of goals of treatment is important. Future research to determine how best to address these sex specific differences is recommended.

	Males (n, %) by encounter	Females (n, %) by encounter	*P*- value
Documentation on File			
Healthcare POA Listed	22, 0.44%	36, 0.84 %	0.013
Living Will Documents Present	258, 5.1%	247, 5.8 %	0.155
Advanced Directive Present	1285, 25.5%	1244, 29.1%	<0.001
Advanced Care Planning Note	437, 8.7 %	411, 9.6%	0.108
Physician orders for life-sustaining treatment (POLST) Present	187, 3.7%	206, 4.8%	0.008
High Risk Factors			
High EOL Index (≥ 30)	2183, 43.3%	1892, 44.3 %	0.316
ICU Stay Documented	2396, 47.5 %	2045, 47.9%	0.703

No, authors do not have interests to disclose

193 Socio-Demographic Disparities in Emergency Department Wait Times

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Study Objectives: The emergency department (ED) boarding crisis has become a public health issue nationally and one major consequence has been prolonged waiting room times for patients requiring emergent medical attention. These patients are at risk for clinical decompensation while waiting to see a provider, potentially leading to increased morbidity and mortality. Waiting room patients are triaged and prioritized based on the emergency severity index (ESI), however some of these criteria may be subjective. The objective of this study was to determine if sociodemographic disparities exist in ED waiting room times.

Methods: This was a retrospective observational study of ED encounters at a single large urban academic medical center ED between July 1, 2023 and December 31, 2023. The main outcome was door-to-provider time. Variables assessed were age, sex, ESI, ethnicity, race, primary language, use of an interpreter, arrival time, homelessness, history of illicit drug use, history of alcohol use disorder, history of psychiatric illness, arrival mode, having a documented primary care physician (PCP), having had an ED visit within the health system within the past 30 days, insurance type, and final disposition. Patient encounters were excluded if their disposition was left without being seen (LWBS) due to significant inaccuracies in recorded door-to-disposition time. Trauma activations from the field were also excluded. A Poisson regression analysis was used for patients with door-to-provider times of less than or equal to 6 hours (n=34,385), and a logistic regression analysis was used to compare these patients to those who waited for greater than 6 hours (n=4,363). Incidence rate ratios (IRR) and odds ratios (OR) were recorded respectively.

Results: In the Poisson regression analysis with patients who waited to see a provider for less than or equal to 6 hours, longer wait times had statistically significant associations with sex, ethnicity, race, and insurance. Specifically, females had a 2% increase in incidence rate of having to wait 1 hour longer to see a provider than males [IRR 1.02, 95% CI (1.01-1.04)], Hispanic patients had a 2% increase compared to non-Hispanic patients [IRR 1.02, 95% CI (1.01-1.04)], Black patients had a 3% increase compared to White patients [IRR 1.03, 95% CI (1.01-1.05)], and patients with a PPO insurance had a 3% decrease compared to patients with Medicare. In the logistic regression analysis, there were significantly increased odds of having to wait for greater than 6 hours for females compared to males [OR 1.14, 95% CI (1.06-1.22)], Hispanic patients compared to non-Hispanic patients [OR 1.26, 95% CI (1.15-1.38)], Black patients compared to White patients [OR 1.35, 95% CI (1.24-1.48)], and homeless patients compared to housed patients [OR 1.46, 95% CI (1.23-1.72)]. Patients with PPO insurance had decreased odds compared to Medicare patients [OR 0.82, 95% CI (0.73-0.93)].

Conclusion: This single-center study found that female sex, Hispanic ethnicity, Black race, and homelessness were associated with longer ED wait times. These potentially vulnerable populations are experiencing longer wait times which can be associated with poor health outcomes and decreased patient satisfaction. Further

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investigation is needed to identify the role of bias and upstream social factors that may contribute to these findings.

Socio-Demographic Disparities in Emergency Department Wait Times

	IRR for patients waiting up to 6 hours (95% CI)	OR for >6 hours vs up to 6 hours (95% CI)
Age		
0-19	0.99 (0.93-1.05)	**0.66 (0.47-0.94)**
20-29	0.99 (0.96-1.01)	0.89 (0.79-1.00)
30-39	Reference	Reference
40-49	1.03 (1.00-1.05)	1.08 (0.96-1.22)
50-59	**1.05 (1.02-1.07)**	**1.16 (1.04-1.31)**
60-69	1.03 (1.00-1.05)	1.09 (0.96-1.24)
70-79	0.98 (0.95-1.02)	1.06 (0.91-1.24)
80-89	1.00 (0.96-1.03)	0.83 (0.69-1.00)
90 and older	0.95 (0.91-1.00)	**0.70 (0.52-0.93)**
Sex		
Male	Reference	Reference
Female	**1.02 (1.01-1.04)**	**1.14 (1.06-1.22)**
ESI		
1	**0.74 (0.63-0.88)**	*
2	**0.94 (0.92-0.96)**	**1.31 (1.16-1.48)**
3	**1.17 (1.15-1.19)**	**3.22 (2.88-3.59)**
4	Reference	Reference
5	**0.70 (0.64-0.77)**	0.70 (0.40-1.21)
Ethnicity		
Non-Hispanic	Reference	Reference
Hispanic	**1.02 (1.01-1.04)**	**1.26 (1.15-1.38)**
Unknown/Declined to answer	0.99 (0.95-1.03)	0.87 (0.70-1.10)
Race		
White	Reference	Reference
Black/African American	**1.03 (1.01-1.05)**	**1.35 (1.24-1.48)**
Asian	1.00 (0.97-1.03)	1.04 (0.91-1.20)
American Indian/Alaskan Native	0.99 (0.90-1.08)	0.97 (0.62-1.54)
Native Hawaiian/Other Pacific Islander	0.98 (0.87-1.11)	1.16 (0.65-2.10)
Unknown/Other	0.99 (0.97-1.02)	1.07 (0.96-1.19)
Primary Language		
English	Reference	Reference
Non-English	1.02 (0.99-1.05)	1.07 (0.93-1.23)
Language Interpreter Used		
No	Reference	Reference
Yes	1.00 (0.97-1.03)	1.05 (0.92-1.19)
Illicit Drug Use		
Yes	Reference	Reference
No	1.01 (0.98-1.03)	0.97 (0.86-1.09)
Unknown	1.00 (0.97-1.04)	0.84 (0.69-1.02)
Alcohol Use Disorder		
Yes	Reference	Reference
No	**1.03 (1.01-1.05)**	1.06 (0.97-1.15)
Unknown	1.02 (0.98-1.05)	1.11 (0.93-1.33)
Psychiatric Illness		
No	Reference	Reference
Yes	1.01 (0.99-1.02)	0.97 (0.90-1.04)
Homelessness		
No	Reference	Reference
Yes	1.02 (0.98-1.05)	**1.46 (1.23-1.72)**
Time of Arrival		
6am-2pm	Reference	Reference
2pm-10pm	**1.18 (1.17-1.20)**	**2.72 (2.51-2.94)**
10pm-6am	**1.08 (1.06-1.10)**	**1.98 (1.79-2.18)**
Mode of Arrival		
Walk-in	Reference	Reference
Ambulance/Police	**0.62 (0.60-0.64)**	**0.18 (0.15-0.21)**
Private car	**1.05 (1.02-1.07)**	1.04 (0.93-1.17)
Documented PCP		
No	Reference	Reference
Yes	0.99 (0.98-1.01)	1.01 (0.93-1.09)
ED Visit Within Last 30 Days		
No	Reference	Reference
Yes	1.00 (0.98-1.02)	1.04 (0.96-1.12)
Insurance		
Medicare	Reference	Reference
Medicaid	1.01 (0.98-1.03)	1.01 (0.89-1.14)
PPO	**0.97 (0.95-0.99)**	**0.82 (0.73-0.93)**
HMO	0.97 (0.94-1.00)	0.89 (0.77-1.03)
Self-Pay	0.98 (0.95-1.01)	0.91 (0.76-1.09)
Workers Comp	0.95 (0.88-1.03)	0.67 (0.42-1.09)
Other	**0.92 (0.86-0.98)**	**0.69 (0.49-0.98)**
Disposition		
Discharged	Reference	Reference
Admitted- ICU	**0.75 (0.71-0.79)**	**0.29 (0.17-0.48)**
Admitted- OR/Cath lab	**0.91 (0.86-0.97)**	**0.64 (0.44-0.92)**
Admitted- step down unit	**0.80 (0.77-0.84)**	**0.40 (0.28-0.56)**
Admitted- telemetry bed	**0.95 (0.93-0.97)**	**0.79 (0.70-0.90)**
Admitted- non-telemetry bed	**1.06 (1.04-1.08)**	1.05 (0.95-1.15)
Transfer to a medical facility	0.99 (0.93-1.05)	1.19 (0.90-1.57)
Transfer to psychiatric facility	**0.75 (0.69-0.83)**	**0.14 (0.04-0.43)**
Against medical advice	0.98 (0.92-1.04)	0.90 (0.66-1.21)
Eloped	**1.10 (1.03-1.18)**	1.31 (0.96-1.79)

*There were no patient encounters assigned an ESI 1 in the group with door-to-provider times greater than 6 hours.

No, authors do not have interests to disclose

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Neighborhood Social Vulnerability and Access to Expedited Partner Therapy Prescriptions: A Secret Shopper Audit Survey

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Study Objectives: Sexually transmitted infections (STIs) disproportionately affect groups with higher social vulnerability. Treatment for the partners of patients with STIs via Expedited Partner Therapy (EPT) decreases rates of STI reinfections and is a way to increase access to care for those who may be medically underserved. However, EPT remains underutilized. Electronic prescriptions further complicate the logistics of provision. Previous surveys have found low pharmacists' awareness of EPT, but no recent study has assessed the real-world availability of EPT in the electronic prescription era. This study investigates the awareness and accessibility of EPT prescriptions in pharmacies and whether there are disparities based on the census tract's socioeconomic Social Vulnerability Index (SVI).

Methods: A random sampling of 347 New York City pharmacies was telephone contacted via a secret shopper audit survey to assess pharmacy practices regarding EPT. EPT is legal under nameless prescriptions by state law. A research associate posing as a patient seeking hypothetical EPT used a script to evaluate pharmacists' awareness, dispensation, and insurance acceptance. Multivariable logistic regressions assessed whether EPT awareness and accessibility varied by SVI.

Results: Overall, a minority of pharmacists were aware of the concept of EPT (40%, n=134) and fewer were willing to fill nameless prescriptions (30%, n=100), but were more likely if they were already aware of EPT (48% vs 18%, p<0.001). Non-chain pharmacies were less likely to be aware of EPT (34%) compared to regional (42%) or national chains (54%) (p=0.02). The most common approach to EPT was to fill the prescription under the index patient name (34%, n=114), and most (86%, n=179) pharmacists accepted some form of insurance. The majority of pharmacists' descriptions for EPT prescriptions did not follow NY state EPT guidelines (54%, n=113). The most common reason for unwillingness to fill EPT was unfamiliarity with the concept (62%, n=66) followed by an incorrect belief that the patient's name was legally required (28%, n=30). Adjusting for neighborhood location, local chlamydia rate, and pharmacy chain type, logistic regression models demonstrate pharmacists in areas with higher socioeconomic SVI scores were more likely to be aware of EPT prescriptions: compared to the lowest SVI, the highest SVI had 3.7 aOR (95% CI 1.39-10.83) for EPT awareness. In terms of willingness to fill nameless EPT, adjusted models revealed no significant association with SVI.

Conclusion: The audit survey revealed low levels of awareness and accessibility of EPT prescriptions across New York City pharmacies. Contrary to expectation, more socioeconomically vulnerable neighborhoods had higher pharmacists' awareness of EPT, but this did not translate into higher fillability of nameless EPT prescriptions in those areas. This dichotomy underscores the need for targeted interventions to improve pharmacy practices regarding EPT, particularly in areas with higher social vulnerability. Enhancing pharmacist training on EPT could help reduce STI health disparities and improve access to care for marginalized populations.

No, authors do not have interests to disclose

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Language Access in the Emergency Department: The Patient's Perspective

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Study Objectives: Although Title VI of the 1964 Civil Rights Act and Section 1557 of the Affordable Care Act both protect patient rights to language access in health care, the underutilization of language services by medical personnel persists. In addition, from the patient's perspective, there is a dearth of knowledge regarding the right to language access and language service availability. Thus, we sought to characterize patients' perspectives on language access in the emergency department (ED).

Methods: We conducted a cross-sectional survey using a convenience sample of adult ED patients, in both English and Spanish, from April 2023 to May 2023 at a safety-net ED in California that serves a predominately Spanish-speaking population. Measures included demographic information, language preference, and modality of communication during the ED visit. The primary outcome of this study was knowledge of the legal right to language access in the healthcare setting. The secondary outcomes were language services utilization and comprehension of clinician-patient communication.

Results: We enrolled 250 participants, with 51% identifying as male, 80% (200/250) identifying as Latinx, 7% as non-Latinx White, and 5% as non-Latinx Black; their median

age was 50 (IQR 40-62). Of the Latinx participants, 76% (151/200) identified Spanish as their primary language with 80% (120/151) indicating having little to no understanding of English. Forty-eight percent (96/200) of the Latinx group reported having an undocumented status. Overall, 38% (96/250) of participants were unaware that language access was a right during a healthcare visit, which was similar within the Latinx group as a whole (38.5%), but no difference based on documentation status. Sixty-seven percent (134/200) of participants reported not being informed of their right to an interpreter during their ED visit. Of those who reported a non-English preferred language, 78% stated that an interpreter was not used during triage, and 62% indicated that an interpreter was not used by the nurse, and 39% for the clinician. Among the participants who indicated Spanish as their primary language, 26% (39/153) stated that their clinician communicated with them using the clinician's own Spanish language proficiency. Additionally, 12% reported using a telephone interpreter, while 22% relied on another hospital employee for communication.

Conclusion: A significant proportion of Spanish-speaking participants in this sample indicated that they were neither aware nor informed of their right to an interpreter. A large proportion of patient interactions necessitating language services lacked professional interpreters utilized during triage or when evaluated by the clinician in the ED. Clinicians resorted to using their own Spanish-language proficiency more often than telephone interpreters.

No, authors do not have interests to disclose

196 COVID-19 Pandemic-Related Racial/Ethnic Disparities in Emergency Department Visits for Patients With Childhood Asthma in the United States

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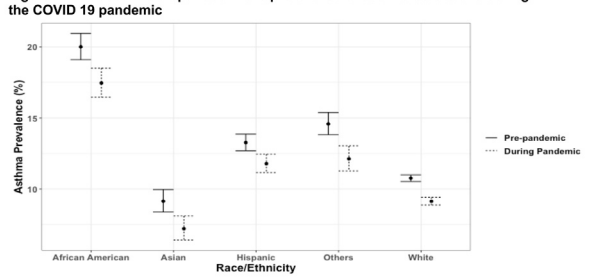
Background: Among the myriad health concerns exacerbated by the pandemic, childhood asthma stands out as a condition of significant concern. Asthma, a chronic respiratory condition characterized by inflammation and narrowing of the airways, affects millions of children worldwide, impacting their daily lives and healthcare utilization. Understanding the intricate interplay between asthma, COVID-19, and racial disparities is crucial for crafting targeted interventions to mitigate adverse outcomes. Epidemiological studies consistently reveal pronounced racial disparities in the prevalence and severity of childhood asthma. Minority populations, particularly Black children, bear a disproportionately higher burden of asthma prevalence, morbidity, and mortality compared to their White and Hispanic counterparts. Complex interactions between socio-economic factors, environmental exposures, genetic predispositions, and healthcare access contribute to these disparities, perpetuating cycles of inequity in healthcare delivery and outcomes. While respiratory infections like COVID-19 posed heightened risks for individuals with underlying respiratory conditions such as asthma, paradoxically, the pandemic coincided with a notable decline in emergency department (ED) visits for asthma exacerbations among children. However, amidst this apparent decline, the specific impact on different racial and ethnic groups remains poorly understood. Identifying and dissecting racial disparities in the numbe of ED visits for in chldren with asthma will not only shed light on the nuanced ways in which the pandemic has influenced healthcare-seeking behaviors and outcomes but also pave the way for targeted interventions to address disparities and improve healthcare delivery systems. By confronting these disparities head-on, healthcare stakeholders can strive towards a more equitable and inclusive approach to childhood asthma management, ensuring that no child is left behind in the pursuit of optimal health outcomes.

Methods: Data: NSCH datasets 2016 to 2021. Sample size: 223,544. Population: Children age from zero to seventeen years. The survey included a stratified random sample of the 50 states and the District of Columbia. The outcome variables included emergency department visits for children with asthma. The independent variables were the COVID time period and asthma. We used a difference-in-difference analysis to compare the pandemic period (number of ED visits in the last 12 months for children surveyed in the year 2021) with the pre-pandemic period (2016-2019), adjusting for age, sex, and socioeconomic status. All tests were conducted using the survey R package.

Results: The prevalence of asthma before the pandemic was 12.1% (95% CI = 11.9, 12.3). However, during the pandemic, the prevalence reduced to 10.48% (95% CI = 10.25, 10.72). This reduction in the prevalence of asthma during the pandemic was significant [Prevalence Ratio= 0.866 (0.843, 0.891), $p < 0.0001$]. Pre-pandemic, there were disparities in the prevalence of asthma with African American (AA) children having the highest prevalence. Children from all racial/ethnic backgrounds experienced reduction in the prevalence of asthma (Table 1, Figure 1). Among those with asthma, there was a reduction in the number of emergency department visits, however, there were racial/ethnic differences in the number of ED visits amongst children with asthma (Table 2, Figure 2), although the pandemic related difference in the disparities in ED visits was not significant, adjusting for age, sex, and socioeconomic status ($p = 0.56$).

Conclusion: There were pandemic related differences in the prevalence of asthma among children, with a decrease in prevalence during the pandemic which was noted across all racial/ethnic groups. African American children had the highest prevalence of asthma. Further, there was a reduction in the number of ED visits for children with asthma. African American children had the most number of ED visits. Although there were disparities in the number of ED visits, there were no significant pandemic related differences in the disparities.

Figure 1: Racial/ethnic disparities in the prevalence of asthma before and during the COVID 19 pandemic



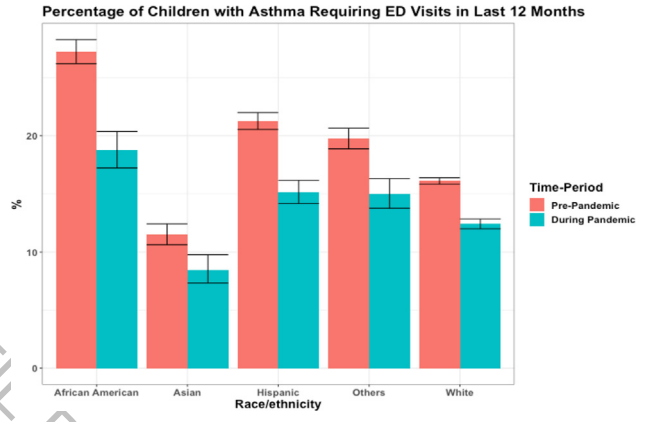


Table 1. Percentage prevalence (95% CI) of asthma for children from different racial/ethnic backgrounds before and during the pandemic

Race/ethnicity	Pre-pandemic	During Pandemic
African American	20.01 (19.1, 20.95)	17.46 (16.46, 18.51)
Asian	9.14 (8.38, 9.96)	7.2 (6.4, 8.1)
Hispanic	13.27 (12.69, 13.86)	11.78 (11.15, 12.45)
Others	14.58 (13.82, 15.38)	12(11, 13)
White	10.76 (10.53, 10.99)	8.5 (8,9)

Table 2. Percentage of children from different racial/ethnic backgrounds with asthma (95% CI) requiring ED visits within the past 12 months before and during the pandemic

Race/Ethnicity	Pre-Pandemic	During Pandemic
African American	27.23 (26.21, 28.28)	18.75 (17.23, 20.37)
Asian	11.49 (10.63, 12.42)	8.47 (7.33, 9.76)
Hispanic	21.26 (20.55, 21.99)	15.14 (14.17, 16.16)
Others	19.76 (18.88, 20.66)	15 (13.77, 16.31)
White	16.11 (15.84, 16.39)	12.41 (12, 12.84)

No, authors do not have interests to disclose

197 Disparities in Psychiatric Admissions From the Emergency Department

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Study Objectives: Timely outpatient psychiatric care can be difficult to access, particularly for vulnerable groups. Thus, patients increasingly present to the emergency department (ED) for acute psychiatric care. With this increase, it is important to understand the inequities in psychiatric care within the ED and its impact on marginalized populations. Specifically, we aim to assess for any disparities in admission rates based on race and ethnicity, insurance status, and housing status. Furthermore, we aim to stratify based on chief complaints of suicidality or self harm, homicidality or aggressive behavior, anxiety, depression, or panic. The data from this study will be used to further quality improvement within our operations.

Methods: In this cross-sectional observational study, we examined patient visits to our ED, a quaternary care academic hospital that sees 55,000 patients a year with a separately licensed psychiatric hospital. A waiver exemption was obtained from our institutional IRB. We included all adult (18-65 yr old) patient visits to our ED with a psychiatric consult from January 1, 2023 to December 31, 2023. We obtained data via hospital EHR records. Data collection steps can be seen in the Figure. Our primary outcomes were admission rates by race, housing, and insurance status. Our secondary outcomes were admission rates by chief complaint and transfer rates for patients of different housing and insurance statuses. We assessed for admission, transfer, or discharge dispositions via orders placed within the EHR.

Results: There were a total of 3,830 patient visits that received a psychiatric consult during our data analysis. Regarding patient visits, White patients made up 55%, Black patients made up 17%, Latino patients made up 20%, Asians/Pacific Islander (AAPI) patients made up 8%, and Indigenous patients made up .7%. Unhoused patients made up 20% of visits compared to 80% from housed patients. Patients with public and private insurance both represented about 50% of patient visits. Full results can be seen in Tables 1 and 2. Overall, 58% of all patient visits with a psychiatric consult were admitted. Black, Indigenous, and Latino patients had lower admission rates as compared to White patients. Patient visits for individuals with private or public insurance had similar admission and transfer rates. Patient visits for those who were unhoused had lower admission rates as compared to housed patients. When unhoused patients were admitted, they were more often transferred to outside facilities as opposed to admission at our psychiatric hospital. When examined by chief complaint, Black and Latino patients were less likely to be admitted for all chief complaint categories compared to White patients. AAPI patients had higher admission rates as compared to overall admission rates amongst all chief complaint categories.

Conclusion: In conclusion, our ED treats a high acuity group of patients with psychiatric complaints, many of which require acute inpatient stabilization. We found disparities amongst Black, Latino, Indigenous, and unhoused patients that present to our ED. The data demonstrated in this study may infer inequities in the healthcare provided to these demographic groups. This is in agreement with well documented racial and socioeconomic disparities within psychiatric care and the overall healthcare system. Further collaboration between EM and Psychiatric physicians to create standardized systems of evaluation can help alleviate disparities and reduce inequities in care. This would help our quality improvement efforts by removing bias from the evaluation process and creating more equitable care within our department.

FIgure 1: Data Collection Organization

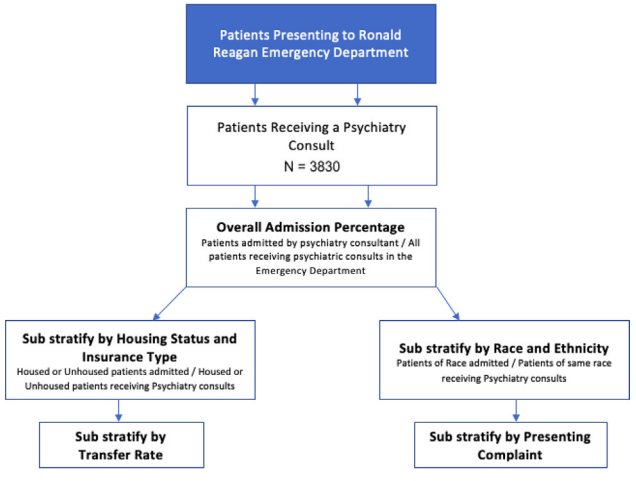

Figure 1: Diagram demonstrating data collection processes in cross sectional study protocol.

Table 1

	Overall Admission Rate (N=3830)	Admission Rate for Suicidality/Self Harm (N=1190)	Admission Rate for Homicidality, Aggressive Behavior, Mania (N=148)	Admission Rate for Anxiety, Depression, and Panic (N=103)
All Patients	58% (N=2226)	61.5% (N=732)	63% (N=92)	40.7% (N=42)
White Patients (N=2113)	60% (N=1270)	62.4% (N=410)	71.2% (N=52)	40.6% (N=24)
Black Patients (N=663)	52% (N=348)	57.6% (N=121)	67.5% (N=25)	36% (N=4)
Latino Patients (N=757)	55% (N=413)	57.6% (N=150)	50% (N=14)	34.7% (N=8)
AAPI Patients (N=309)	68% (N=211)	69.3% (N=70)	75% (N=3)	57% (N=4)
Indigenous Patients (N=30)	53% (N=16)	83.3% (N=10)	50% (N=1)	N/A

Table 1: Admission results by race. Overall admission rates are noted in the first column followed by chief complaint specific admission rates stratified by race.

Table 2

	Overall Admission Rate	% of Admit Admitted to Quaternary Care Psychiatric Hospital	% of Admits Transferred to Outside Facility
Housed Patients (N=3070)	61% (N=1877)	82% (N=1534)	18% (N=343)
Unhoused Patients (N=760)	46% (N=349)	75% (N=263)	25% (N=86)
Patients with Private Insurance (N=1978)	59% (N=1169)	80% (N=939)	20% (N=230)
Patients with Public Insurance (N=1632)	58% (N=944)	79% (N=744)	21% (N=200)

Table 2: Admission rates for Housed vs Unhoused patients and Patients with Private insurance vs Public Insurance. Overall admission rates in each of these categories are noted. Percent of admits transferred are also noted as well.

No, authors do not have interests to disclose

198 Assessment of the Prognostic Significance of Granulocytic Subpopulations in Patients With COVID-19

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Study Objectives: The evolution of SARS-CoV-2, along with its variants and the impact of vaccinations, has altered the clinical course over time. Numerous studies seek to correlate laboratory data with the course of covid19. Among the examined risk factors is eosinophilia: antiparasitic immunity, allergies and has antiviral activity. Eosinophils are activated by IL-5, IL-13 and various immune cytokines; can interact with platelets and stimulate thrombus formation. Neutrophils and lymphocytes are associated with immune responses to bacteria and viruses. The neutrophil/lymphocyte ratio has been studied in various inflammatory conditions, such as sepsis. Both eosinophil levels and the Neutrophil/Lymphocyte ratio (N/L) have been associated with a worse prognosis for COVID-19, but the data are conflicting. Our study aims to verify if there is a real association between eosinophils and the N/L ratio, in the progression of COVID-19.

Methods: This is an observational, retrospective, multicenter study by enrolling patients aged >18 years, of both sexes, presenting to the emergency department of Policlinico Gemelli from January 1, 2020 to December 31, 2022 and testing positive for SARS-CoV-2. We collected anamnestic data (comorbidities, home therapy), laboratory data (complete blood count, coagulation parameters, D-dimer, PCR, PCT, LDH, creatinine, azotaemia), therapies performed (corticosteroids, antivirals, monoclonals, biologics), vaccination status, BMI, GCS, SatO2 and oxygen requirement, ward of admission (intensive care unit/regular ward) and outcomes up to 30 days from admission. Patients were divided into two subgroups: recovered-deceased and the aforementioned variables were analysed. The objective of our study is to evaluate the association between 30-day mortality and eosinophilia or the N/L ratio in COVID-19.

Results: 1,520 patients recruited with a mean age of 67 +/- 16 years, 59% of whom were men. 1,233 patients admitted to a regular ward and 287 (19%) to intensive care. 1,191 patients recovered; 329 (22%) died. 53% had more than one comorbidity: 17% obesity (mean BMI of 26 +/- 4); 13% active neoplasms; 7% chronic lung diseases. 9% required high-flow nasal oxygen (HFNC), 5% required NIV and 7% required intubation. 82% of our sample had received at least one dose of the COVID-19 vaccine. We didn't observe differences in mortality among patients with different viral variants, vaccination rates and therapy. The population was also divided into two groups: recovered and deceased. Among the deceased, 58% were male and 59% were admitted to non-intensive care settings. 70% had 2 comorbidities. Continuous variables, that showed significance between the groups, were dichotomized after constructing an ROC curve and calculating the best cutoff using the Youden index. By a multivariate analysis: age and hypertension were significantly correlated with 30-day mortality ($p<0.0001$) as active neoplasms ($p<0.043$) or Alzheimer's disease ($p<0.0001$). Equally significant were a P/F ratio <263 ($p<0.0001$), azotaemia >23 ($p<0.0001$), PCR >65 ($p<0.0001$), PCT >0.12 ($p<0.0001$) and D-dimer >875 ($p<0.0001$). Eosinophilia wasn't correlated with mortality; on the contrary an N/L ratio >6, was predictive of death with $p<0.005$.

Conclusions: From our results, it emerges that there isn't significant and independent correlation between eosinophilia and 30-day mortality in patients with COVID-19. Conversely, the N/L ratio is independently and significantly correlated with mortality in patients with SARS-CoV-2. The N/L ratio could be a useful tool to add to known risk factors (age, comorbidities, BMI and respiratory failure) for an early prognostic evaluation of patients with COVID-19.

No, authors do not have interests to disclose

199 Evaluation of the Diagnostic Accuracy of Exhaled Nitric Oxide as a Marker of Infection and Sepsis in Emergency Department Patients

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Background: Early identification of septic patients in the emergency department (ED) is important, but high patient volumes and lengthy wait times often delay workups, and typically used non-invasive triage screening tools such as vital signs and qSOFA have poor sensitivity. Nitric oxide (NO) is a molecule in the blood that has been found to be upregulated in sepsis. Because it has a very short half-life in blood, its measurement can be challenging. We aimed to determine if exhaled NO could be used to help predict bacterial infection and sepsis.

Methods: Emergency department patients with concern for infection were assessed for enrollment. Patients were included if blood cultures were ordered by the ED provider. The exhaled breath NO levels of enrolled subjects were measured. A score (Vital Signs and Nitric Oxide - VSNO) was then created that included triage vital signs and NO level.

Results: 104 patients (41 female) were enrolled. The median exhaled NO level was 9.8 parts per billion (ppb) (IQR 5.6-17.0). Sixty-two (60%) patients were diagnosed with bacterial infection and of those 54 (52%) patients were diagnosed with sepsis. Using cut points of <7 or >12 ppb, the VSNO score demonstrated a sensitivity of 0.89 (95% CI: 0.77-0.96) and a specificity of 0.50 (95% CI: 0.36-0.64) for predicting sepsis. The score showed a sensitivity of 0.82 (95% CI: 0.70-0.91) and a specificity of 0.48 (95% CI: 0.32-0.64) for predicting bacterial infection.

Conclusions: Exhaled NO measurement combined with vital signs has a high sensitivity for detection of bacterial infection and sepsis. In a clinical setting, this score would be immediately available to clinicians at the point of triage and would help to identify patients who should receive expedited evaluation and care. Further research is warranted.

Yes, authors have interests to disclose

Disclosure: Drs. Zwank and Farrar have received single payments for their advice and for their work as investigators of this study which is sponsored by Vail Scientific.

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Drs. Zwank and Farrar have received single payments for their advice and for their work as investigators of this study which is sponsored by Vail Scientific.

200 Diagnosis and Treatment of Trichomonas by Urinalysis in the Emergency Department: Incidence, Sensitivity, Co-infections, and Treatment (2019 - 2023)

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Study Objectives: Sexually transmitted infections (STIs) are a common presenting complaint to the emergency department (ED). Test results are often unavailable in real- time leaving clinicians to use their best judgement when deciding to treat STIs empirically. Past studies show wide variability in empiric coverage; up to 65% of patients did not receive treatment. Follow-up failure rates have been as high as 81%. Trichomonas is the third most prevalent STI in the United States with a prevalence of 2.6M and has the second highest incidence at 6.9M. Traditionally, screening for STIs is performed by PCR; occasionally, Trichomonas will be reported by urine microscopy, which may be overlooked secondary to how results are displayed in the electronic health record, or if the clinician is focused on other components of the urinalysis (ie, nitrites/pyuria, etc). This study explores the incidence of Trichomonas reported via urinalysis in the ED, the diagnostic performance of urinalysis compared to PCR for Trichomonas, the rate of empiric treatment/additional STI screening in patients positive for Trichomonas via urinalysis, the incidence of co-infections with Gonorrhea/Chlamydia, and the utility of empiric treatment for co-infections when Trichomonas is detected via urinalysis.

Methods: All patients 18 years or older presenting to two community EDs located in Southeast Michigan between 1/1/2019 and 12/31/2023 that were screened for STIs via PCR, or who had Trichomonas detectable in their urine were included in this study.

Results: Over the 5 year period, 9,923 patients received PCR testing for Gonorrhea, Chlamydia, and Trichomonas. 23.9% tested positive for one or more STI. The most prevalent STI was Trichomonas at 11.5%, Chlamydia was 9.1% and Gonorrhea was 7.3%. 20.4% of patients tested positive for one STI via PCR. 3.6% of patients tested positive for multiple STIs (3.3% had 2 STIs, 0.3% had 3 STIs). 937 patients were found to have Trichomonas via urinalysis, 694 (74.1%) had no additional STI screening. There were 7,139 patients with both urinalysis and PCR testing for Trichomonas. Sensitivity for Trichomonas by urinalysis was 29.1%; specificity was 99.98%. 80.9% of patients diagnosed with Trichomonas via urinalysis were not treated, 12.9% were empirically treated for all STIs, 5.3% were treated with metronidazole and one additional antimicrobial, and 0.85% of patients received ceftriaxone, doxycycline, or azithromycin without receiving metronidazole. The incidence of co-infection with Chlamydia or Gonorrhea when trichomonas was present on urinalysis was 12.1% and 8.0%, respectively. Assuming no treatment failures, the number needed to treat (NNT) to prevent one missed case of Chlamydia or Gonorrhea without additional was 8.3 and 12.5, respectively.

Conclusions: Urinalysis is not as sensitive as PCR for the diagnosis of Trichomonas; however, the high specificity of Trichomonas detection in urine microscopy should prompt the provider to treat trichomonas empirically. The incidence of co-infection with Gonorrhea and/or Chlamydia should prompt the provider to obtain further STI screening when Trichomonas is detected via urinalysis. Consideration for empiric treatment for common STIs should be strongly considered when Trichomonas is detected via urinalysis. Additionally, the low rate of treatment with positive Trichomonas on urinalysis indicates clinicians are unaware or missing Trichomonas results on urinalysis. Improving clinician response to these results may be accomplished by optimizing reporting within electronic health record for urine Trichomonas results and improving clinician education.

No, authors do not have interests to disclose

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

201 A Recombinant Native Human Anti-Tetanus Monoclonal Antibody Versus Human Tetanus Immunoglobulin for Passive Immunization Against Tetanus: A Double-Blind, Randomized, Phase 3 Trial

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Study Objectives: Tetanus remains a significant public health concern in many parts of the world. Passive immunization is crucial for providing immediate protection to patients with tetanus-prone wounds who have incomplete or unknown vaccination history, as well as to immunocompromised individuals. Currently, the only recommended passive immunization therapy for tetanus prophylaxis is plasma-derived human tetanus immunoglobulin (HTIG), which is encountering a global supply shortage. Despite safety concerns, equine tetanus antitoxin (TAT) is still widely used. It is highly warranted to develop a safe and highly effective therapeutic monoclonal antibody (mAb) to substitute TAT and HTIG for prevention and treatment of tetanus infection. Siltartoxatug, a first-in-class recombinant native human mAb against tetanus toxin, is being developed for tetanus prophylaxis. The objective of the phase 3 clinical trial of siltartoxatug was to compare the efficacy and safety of siltartoxatug with HTIG for passive immunization against tetanus.

Methods: This randomized, double-blind, active-controlled, phase 3 trial was conducted in 28 trial centers, mainly in emergency departments, in 28 hospitals across 14 provinces in China from December 2022 to July 2023 (ClinicalTrials.gov NCT05664750). Eligible participants were adults with tetanus-prone wounds. Participants were excluded if they had received ≥3 doses of tetanus toxoid-containing vaccine, required HTIG 500 IU, or used immunoglobulins or blood products within 6 months. Participants were randomized to receive a single intramuscular injection of siltartoxatug 10 mg or HTIG 250 IU in a 2:1 ratio, stratified by concomitant administration of adsorbed tetanus vaccine. Primary efficacy outcome was the proportions of participants with an increase of anti-tetanus neutralizing antibody titers from baseline (ΔTiters) ≥0.01 IU/mL at 12 hours post dose. Secondary and tertiary efficacy outcomes included tetanus protection rates and ΔTiters at various time points post dose. Safety evaluations included adverse events (AEs), laboratory tests, electrocardiograms (ECGs) etc.

Results: Of 715 screened patients, 675 were randomized, with 661 receiving the study drug. Demographic and baseline clinical characteristics were balanced between groups. The proportion of siltartoxatug recipients with ΔTiters ≥0.01 IU/mL at 12 hours post dose was 95.4%, which was significantly higher than that of HTIG receipts (53.2%). Both groups showed high and comparable proportions with ΔTiters ≥0.01 IU/mL at 3, 7 and 28 days post dose. At 90 days post dose, the proportion in the siltartoxatug group remained high at 91.5% while HTIG group decreased to 10.1%. The geometric mean titers (GMTs) of anti-tetanus neutralizing antibody in siltartoxatug group were significantly higher than that in HTIG group at all time points post dose (Table 1). No tetanus cases occurred in both groups. AEs and treatment-related AEs were similar between groups.

Conclusion: Siltartoxatug demonstrated excellent efficacy and safety for passive immunization against tetanus. It can provide protective levels of anti-tetanus neutralizing antibodies in much more quick time and higher antibody levels, and sustain the protective levels for a longer duration in comparison with HTIG. Siltartoxatug has great advantage to substitute equine tetanus antitoxin and HTIG as a safer and more effective first-line tetanus passive immunization therapy.

Table 1 Anti-tetanus neutralizing antibody ΔTiters at different time points post dose

	Siltartoxatug (N=440)	HTIG (N=221)	Intergroup difference (95% CI)
Primary endpoint			
Participants (%) with ΔTiters ≥0.01 IU/mL at 12 hours post dose	95.4%	53.2%	42.3% (35.5-49.1)
Tertiary endpoints			
ΔTiters at 12 hours post dose, IU/mL	0.0602 (117.5)	0.0100 (85.0)	OR 6.02 (5.08-7.12)
Participants (%) with ΔTiters ≥0.01 IU/mL at 3 days post dose	99.7%	96.4%	3.35% (1.33-7.03)
ΔTiters at 3 days post dose, IU/mL	0.187 (78.9)	0.0332 (63.7)	OR 5.54 (4.88-6.29)
Participants (%) with ΔTiters ≥0.01 IU/mL at 7 days post dose	99.7%	97.4%	2.31% (0.595-5.63)
ΔTiters at 7 days post dose, IU/mL	0.233 (61.9)	0.0360 (50.5)	OR 6.52 (5.85-7.27)
Participants (%) with ΔTiters ≥0.01 IU/mL at 28 days post dose	99.7%	95.8%	3.91% (1.73-7.77)
ΔTiters at 28 days post dose, IU/mL	0.156 (43.9)	0.0208 (52.5)	OR 7.13 (6.48-7.85)
Participants (%) with ΔTiters ≥0.01 IU/mL at 90 days post dose	91.5%	10.1%	81.3% (75.5-85.8)
ΔTiters at 90 days post dose, IU/mL	0.0253 (70.9)	0.00429 (75.0)	OR 5.38 (4.68-6.18)

CI, confidence interval; CV, coefficient of variation; OR, odd ratio.
Values of the ΔTiters are presented as geometric mean (%CV).

No, authors do not have interests to disclose

202 Navigating the 'Twindemic': A Predictive Model for Emergency Department Length of Stay in COVID-19 and Influenza Patients

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Study Objectives: During the ongoing COVID-19 and influenza "twindemic," precise prediction of emergency department (ED) length of stay (LOS) is essential for efficient resource allocation and patient care, particularly in an era of extraordinary ED boarding. This study aimed to create a dependable early triage prediction model using common clinical parameters for LOS.

Methodology: Between November 1, 2023, and December 31, 2023, patients from ten EDs in Michigan were included in this multicenter cohort study who tested positive for COVID-19 or Flu A or B. Data included arrival timestamps and mode, demographic data, complaints and diagnoses, ED disposition, viral test results, and emergency severity index (ESI). We analyzed LOS as the primary outcome, treating such as a binary variable of more or less than 4 hours. We used a classification technique known as Extreme Gradient Boosting (XGBoost) and divided the data into 80% training and 20% testing sets. Model parameters were optimized using five-fold randomized grid search cross-validation. In addition, the dataset was balanced using the Synthetic Minority Oversampling Technique (SMOTE), and the original dataset's distribution was preserved in each fold using Stratified K-Fold. We constructed Receiver Operating Characteristic (ROC) curves and reported the area under the curve (AUC) and weighted F1 score for precision.

Results: Of the 18,282 patients who visited the 10 EDs during the study period, 1,246 (6.8%) tested positive for COVID-19 or Flu. The mean age was 39.7 years, 58.5% were female, 41.7% were Black, and the median ESI was 3. The medial LOS was 4.7 hours, and 36.7% of patients stayed in the ED for longer than four hours. The analysis identified 25 independent characteristics predictive of ED stay (Figure 1a). The machine learning model (XGBoost) performed well in identifying patients likely to have an ED stay > 4 hours with an accuracy of 77.20%, an F1-score of 0.77, and an AUC score of 0.73 (Figure 1b).

Conclusions: Using a predictive framework based on clinical and demographic characteristics, we demonstrate the potential to improve hospital resource planning and ED scheduling through early prediction of LOS. Future work to integrate such models into operational planning is indicated.

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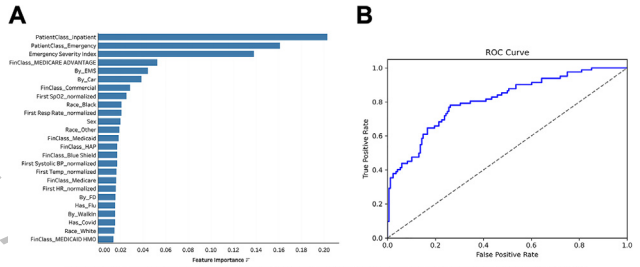

Figure 1: (A) Significant Features and (B) Receiver Operating Characteristics Area Under the Curve

No, authors do not have interests to disclose

203 Enhancing Artificial Intelligence Performance in Bilingual Emergency Medicine Board Exam: The Impact of Retrieval-Augmented Generation

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Background: Integrating large language models (LLM) with emergency medicine offers potential breakthroughs in patient care and education. Studies by Jarou et al. and Igarashi et al. have demonstrated that LLMs like GPT-4 can achieve human-level performance in emergency medicine tests and board exams, although they also underline the necessity for physician oversight. Our study expands this scope to bilingual examination settings in Taiwan, using Retrieval-Augmented Generation (RAG) to optimize LLM performance by leveraging emergency medicine knowledge. Here, 'bilingual' specifically refers to the use of Traditional Chinese and English. We aim to quantify the RAG's enhancement effect on LLM accuracy in a bilingual context of emergency medicine.

Method: For this study, we gathered multiple-choice questions (MCQs) from Taiwan's emergency medicine board exams spanning 2015 to 2023, carefully excluding any questions containing images. We selected four language models for evaluation: GPT-4.0, GPT-3.5, Google Gemini Pro, and Claude Haiku. We implemented a Retrieval-Augmented Generation (RAG) strategy, employing an ensemble retriever approach that integrates PubMedBERT embeddings for semantic analysis and BM25 for text search, specifically analyzing 'Tintinalli's Emergency Medicine' textbook. For semantic embedding, the content was segmented into 2000-token blocks with a 200-token overlap to ensure thorough coverage. To address potential biases and overfiltering by the models' safety mechanisms, we set each model's filter to its lowest sensitivity and adjusted their operational settings to reduce randomness, fixing the temperature at 0.1 for more consistent and predictable responses. The four language models were accessed via API calls, and by integrating Langchain functionalities with tools from Hugging Face, we facilitated automated and streamlined interactions between the prompts, the retrieval process, and the language models' response generation. In the RAG combined group, The LLMs were prompted to formulate answers based on the search results retrieved or to explicitly state 'Insufficient information for a definitive evaluation' should the retrieved data fail to support a definitive answer. The entire research process, including the execution of the RAG and the handling of the language models, was conducted using Spyder version 5.5.1 and Python 3.10. The performance of each model, either with or without the RAG enhancement, was meticulously recorded, and the differences in scores were statistically analyzed using the Wilcoxon signed-rank test to ascertain the significance of RAG's contribution to the accuracy of the models' answers.

Results: Our analysis indicated significant improvements in the performances of GPT-4.0, GPT-3.5, and Google Gemini Pro when augmented with RAG, confirming its effectiveness in boosting accuracy. The enhancements for GPT-3.5 were more modest, but they were still statistically significant. Importantly, while not all models demonstrated equally dramatic improvements, the integration of RAG consistently enhanced the models' ability to process and respond to bilingual emergency medicine questions.

Conclusion: This study confirms that RAG can notably enhance LLM performance in bilingual emergency medicine board exams in Taiwan, showing substantial improvements across various models. Despite varied results, the integration of LLM with Retrieval-Augmented Generation (RAG) to expand their knowledge in emergency medicine represents a significant advancement. This approach can serve as a foundational step for future applications in bilingual environments, potentially enhancing patient care and medical education.

	GPT-4.0		GPT-3.5		Gemini Pro		Claude Haiku	
	Plain	With RAG	Plain	With RAG	Plain	With RAG	Plain	With RAG
2017	75.00	79.38	38.14	40.63	40.21	57.73	44.33	58.76
2018	73.47	78.57	29.29	36.73	32.32	59.60	33.33	51.52
2019	58.06	64.52	32.98	31.18	26.88	40.43	45.74	37.23
2020	57.75	68.65	29.95	40.54	40.96	55.38	27.27	45.74
2021	59.02	66.12	29.35	37.16	39.13	53.85	29.35	51.63
2022	63.22	74.71	26.14	38.29	31.25	46.02	27.27	36.93
2023	53.80	56.73	22.67	29.41	27.33	35.50	24.42	35.47
p-value	0.016		0.03		0.016		0.03	

No, authors do not have interests to disclose

205 Leveraging Large Language Models for Improving Clinical Outcomes in the Emergency Department: A Systematic Review

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Background: The rapid advancement of large language models (LLMs) has the potential to transform the emergency department (ED) across the spectrum of patient care, clinical operations, research methods, and electronic health record (EHR) integration. However, the current collective landscape of research specific to EM in this area is relatively unknown. To better understand the development and current application of LLMs in emergency medicine (EM) for clinical and patient-centered outcomes, we undertook a systematic review of the current literature.

Methods: We conducted a comprehensive literature search to identify studies utilizing LLMs that included literature up until December 20, 2023, using MEDLINE, Embase, Scopus, Web of Science, the Cumulated Index to Nursing and Allied Health (CINAHL), and pre-print servers. Inclusion criteria were 1) studies utilizing emergency department patient populations 2) a focus on clinical or patient centered outcomes 3) usage of LLMs with transformer-based architecture. We excluded studies that utilized hypothetical EM cases, non-clinical outcomes, traditional NLP techniques, or were purely methodological or review articles. A standardized extraction approach using two independent reviewers (EA and DA) was performed.

Results: 10 studies met final inclusion criteria. All studies identified were retrospective and observational in design, with the majority published in 2023 (n =9). 4 studies utilized BERT models, 5 studies utilized GPT models (3.5, 4, or 4.0) and one study utilized Longformer models. EM research areas were diverse with the greatest distribution (n = 3) including a focus on triage decision making, acuity, or prediction. Other topic areas identified included radiology referrals and imaging selection, chest x-ray interpretation, urinary tract infection symptom identification, and hospitalization length of stay prediction. Study population sample sizes varied significantly from almost 1.5 million patients to 56. Evaluation metrics included Area Under the Receiver Operating Characteristic Curve (AUROC), sensitivity, specificity, precision, and F1 scores. 4/10 studies used emergency physician agreement metrics to assess model performance. Only one study identified utilized an independent test dataset for model evaluation. Model performance was highly variable given the heterogeneity, differing study design, and model architectures employed.

Conclusions: This systematic review underscores the burgeoning and nascent application of LLMs for clinical and patient-centered outcomes in EM. Future research should aim to develop standardized methods and more robust approaches in study design, safety, assessing bias, and external validation of models.

No, authors do not have interests to disclose

206 Harnessing Artificial Intelligence to Predict Opioid Overdoses in Emergency Departments: A Systematic Review

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Study Objectives: In the Fall of 2017 following the deaths of 47,600 individuals, the United States of America (USA) announced the opioid epidemic as a national public health crisis. Subsequently, opioid-related overdoses in emergency departments have surged, compelling healthcare experts and researchers to explore strategies for prediction and prevention. The emergence of artificial intelligence (AI) tools offers promising avenues in this realm. This systematic review not only outlines the research that investigates AI's

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capability to predict opioid overdoses but also summarizes the diverse algorithms employed in these studies.

Methods: Our team completed the review utilizing the following three databases: PubMed, EMBASE, Web of Science. The systematic review was completed in strict accordance with the PRISMA guidelines framework and was not registered with PROSPERO. The three databases were searched from January 1960 to March 2024 for keywords: "((artificial intelligence) OR (machine learning)) AND ((predict opioid overdose) OR (opioid overdose) OR (opioid death))." Exclusion criteria included review articles and non-English studies. We utilized the Critical Appraisal Skills Programme (CASP) to assess risk of bias and quality. Our systematic review did not progress into a meta-analysis based on established study outcomes and methodologies.

Results: Our initial search of three databases yielded 475 publications. Following thorough study screening and the removal of duplicate studies, we ensured studies met the inclusion criteria and the objective of the systematic review. Overall, 7 studies including 13,383,095 patients and 14 AI tools were included in this review after the screening process. Among the documented AI and machine-learning algorithms, the most used tools were logistic regression (57.1%) and random forest (57.1%). The included papers did not include statistics regarding the accuracy rates of the tools or topics regarding prediction of opioid abuse disorders and survival rates.

Conclusions: To our knowledge, this is the first review conducted regarding this topic. Our assessment suggests that AI tools hold promise in providing an accurate and potentially life-saving means for predicting opioid overdoses among repeat patients and vulnerable populations. However, a limitation is the scarcity of identified studies and the novelty of these tools in overdose prediction. More extensive research and the development of additional algorithms utilizing larger patient datasets are imperative before these tools can be widely integrated into emergency departments and primary care centers.

Table 1. AI's Capabilities in Opioid Overdose Prediction

Authors	Sample size	AI tool/ML algorithm	Country	Prediction Accuracy (%)
Dong et al. (2021)	7,345,035	DT, LR, LSTM, LSTMA, NN, RF	USA	DT: 74.67 LR: 79.43 LSTM: 80.42 LSTMA:81.30 NN: 79.28 RF: 79.59
Dong et al. (2020)	550,000	DL, DT, LR, RF	USA	DL: 97.64% DT: 97.18% LR: 95.73% RF: 98.05%
Li et al. (2018)	1,246,642	BTC, LR	USA	75.438%
Lo-Ciganic et al. (2022)	639,693	GBM, LR, PR, RF	USA	N/A
Lo-Ciganic et al. (2019)	560,057	GBM, LASSO, MVLR, NN, RF	USA	N/A
Matero et al. (2023)	N/A	TSM	USA	97%
Ripperger et al. (2021)	3,041,668	EL	USA	N/A

AI, artificial intelligence; BTC, boosted tree classifier; DT, decision tree; EL, ensemble learning; GBM, gradient boost machine; LASSO, least absolute shrinkage and selection operator-type regression; LR, logistic regression; LSTM, long short term memory network; LSTMA, long short term memory network + attention; MVLR, multivariate logistic regression; ML, machine learning; N/A, not applicable; NN, neural network; PR, penalized regression; RF, random forest; TSM, transformer sequence model.

No, authors do not have interests to disclose

207 Impact of a Best Practice Advisory to Increase Narcan® Discharge Prescriptions for Patients at Risk of Opioid Overdose

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Study Objectives: The purpose of this study was to evaluate the effectiveness of an electronic health record Best Practice Advisory (BPA) in increasing Narcan® discharge prescriptions for patients at risk of opioid overdose.

Methods: A quasi-experimental study involving the retrospective review of patient medical records was performed. Patients presenting to a large public healthcare system in the southeast United States were screened for eligibility. A disruptive BPA was programmed in the Epic electronic health record system to alert clinicians of patients with a combined morphine milligram (mg) equivalents (MME) of 50 mg per day or greater. The BPA notified clinicians of the calculated MME based upon medications reconciled at discharge and would facilitate ordering of intranasal Narcan® home kits. Outcomes included the number of Narcan® home kits ordered to and dispensed from outpatient pharmacies. The BPA was implemented in December 2023. Patient encounters were divided into pre-BPA (September 1, 2023, through November 30, 2023) and post-BPA (January 1, 2024, through March 30, 2024) cohorts. Descriptive statistics were summarized, and student's t-tests comparing Narcan® discharge prescriptions ordered and dispensed between pre- and post-BPA cohorts were performed using SAS v9.4 (SAS Institute, Cary, NC).

Results: An average of 30.7 (SD: 4.5) and 155 (SD: 24.9) monthly prescriptions were ordered to outpatient pharmacies for the pre- and post-BPA cohorts, respectively, and this difference was statistically significant ($p=0.002$). An average of 16.7 (SD: 1.2) and 79 (SD: 11.4) monthly prescriptions were dispensed by outpatient pharmacies for the pre- and post-BPA cohorts, respectively, and this difference was statistically significant ($p<.001$).

Conclusion: The deployment of a targeted disruptive BPA within the Epic electronic health record system significantly increased Narcan® discharge prescription ordering and dispensing for patients at risk of opioid overdose. This initiative reinforces the utility of electronic health record alerts in optimizing patient care. Further research investigating the impact of such an initiative on reducing opioid overdose-related deaths in the hospital catchment area is warranted.

No, authors do not have interests to disclose

208 Using Large Language Models to Investigate and Categorize Bias in Clinical Documentation

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Background: Negative descriptors and discriminatory language in electronic medical records (EMRs) perpetuate stigma, bias and inequities leading to worse outcomes for marginalized groups. This study leverages ChatGPT-4's capabilities to efficiently identify and categorize biases within unstructured clinical notes from emergency department (ED) visits and intensive care unit (ICU) admissions. It investigates how patient factors like race, gender, housing status influence negative descriptor bias, assesses GPT-4's potential for generating anti-bias suggestions, and examines bias detection before/after interventions to reduce discriminatory language.

Methods: We utilized a corpus of 50,000 emergency department notes from the Mount Sinai Health System, integrating them with MIMIC-IV discharge summaries to encompass a diverse patient profile. The F.A.I.R. documentation workgroup developed guidelines identifying "Never Words" linked to bias, which were then targeted using natural language processing (NLP) techniques. We employed GPT-4's advanced language model capabilities for zero-shot learning, enabling the detection and categorization of biased phrases without prior specific training. The analysis involved univariate and multivariate logistic regression to identify and adjust for confounders in assessing the relationships between documented biases and various cofactors.

Results:

Overall Bias: Night shifts (23:00-07:00) were associated with an increased odds of bias (OR 1.37, $p<0.001$). Increased ED visits showed a rising trend in bias likelihood, with 4-9 visits (OR 1.40, $p<0.001$) up to over 101 visits (OR 2.85, $p<0.001$) showing progressively higher odds ratios. Notable complaint categories included "Psych" (OR 1.53, $p<0.001$), "Glucose Metabolism" (OR 2.07, $p<0.001$), and "Substance Use Disorder" (OR 3.09, $p<0.001$), each significantly linked to increased bias odds. Demographic factors such as male gender (OR 1.58, $p<0.001$) and non-conforming gender identities (OR 2.12, $p=0.010$) were also significant predictors of bias.

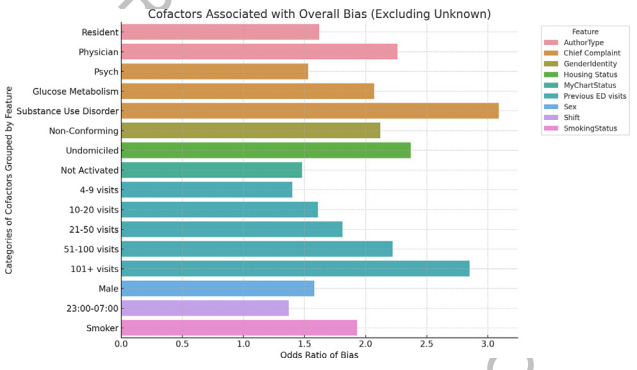
Discrediting Bias: The highest rates of discrediting bias were found in records concerning undomiciled status (16.9%), ED visits over 101+ (12.7%), and complaints related to "Substance Use" (19.2%).

Judgmental Bias: Factors such as undomiciled status (14.2%), high frequency ED visits (9.8% for both 51-100 and 101+ visits), and chief complaints about "Substance Use" (14.5%) and "Glucose Metabolism" (14.0%) had higher instances of judgmental bias.

Stigmatizing/Labeling Bias: "Substance Use Disorder" (24.6%) and "Psych" complaints (15.5%) were most associated with stigmatizing/labeling bias, particularly during the night shift (5.2%) and among records authored by residents (5.1%) and physicians (5.8%).

Conclusion: The analysis highlights significant biases in electronic medical records, notably linked with night shifts, frequent emergency department visits, and sensitive

patient demographics such as undomiciled individuals or those presenting with psychiatric and substance use complaints. These findings point to underlying systemic issues that may exacerbate disparities in healthcare delivery. To address these biases effectively, healthcare systems must adopt comprehensive training programs for bias recognition and intervention, enhance EMR systems to detect and flag bias, and enforce rigorous documentation standards. Moreover, leveraging advanced technologies like zero-shot learning can offer a practical, scalable solution for assessing biases across large volumes of EMR data, enabling healthcare providers to monitor and address bias more effectively. Implementing these strategies is crucial for achieving equitable healthcare outcomes and ensuring that all patients receive unbiased care and treatment recommendations. This study underscores the imperative for ongoing surveillance and improvement of healthcare documentation practices to reduce bias and enhance patient care quality universally.



No, authors do not have interests to disclose

209 Ketamine as a Rescue Drug for Patients Presenting With Benzodiazepine-Resistant Status Epilepticus

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Study Objective: Accumulating laboratory data and early clinical findings provide strong rationales for administering ketamine as a rescue drug for benzodiazepine-resistant status epilepticus (SE), particularly in the prehospital setting where there are limited anti-epileptic options as well as difficult challenges in extricating and transporting actively-convulsing patients. The purpose here was to report a multi-year experience of paramedics using ketamine as a rescue drug for midazolam-resistant SE, including the frequency of its effectiveness in suppressing convulsions as well as observation of any attributable complications such as respiratory depression or hypotension.

Methods: *Design:* A seven-year population-based observational study was conducted evaluating outcomes for adult (>17 years of age) SE patients treated with either intravenous (IV), intraosseous (IO), intramuscular (IM) or intranasal (IN) ketamine for persistent seizures despite ample midazolam dosings. Tracked outcomes included: 1) sustained prehospital termination of convulsions; 2) any concerning post-ketamine effects on blood pressure, peripheral oxygen saturation, $ETCO_2$ or need for assisted ventilation / intubation; and 3) any incidental associations with circumstances, demographics. medical history. Corresponding evaluations were made for pre-pubescent children and adolescents.

Setting: Large U.S. county (pop. 961,000) 9-1-1 EMS agency.

Participants: Those receiving 9-1-1 responses for persistent convulsions.

Interventions: If still seizing after receiving two 5 mg IV/IO/IM/IN doses of midazolam, adults and pubescent adolescents received: 100 mg ketamine IV/IO/IM/IN. Pre-pubescent children received 0.1 mg/kg IM/IN of ketamine when 0.1 mg of midazolam IV/IO or 0.2 mg/kg IM/IN (max 5 mg) did not terminate convulsions.

Results: Forty-six adults (31 women/15 men), experienced 57 different SE events managed with the SE-midazolam/ketamine protocol. Ages: 18-86 years (mean 42.6) for women; 21-84 (mean 52.9) for men. Over 80% had confirmed prior histories of seizures/seizure disorders. For all 57 midazolam-resistant events, ketamine fully terminated convulsions in every case (100%) during the entire prehospital and emergency department arrival phases. For approved reasons, paramedics gave only ketamine in eight other adult cases, achieving sustained termination of convulsions in every case. Among 16 childhood/adolescent cases (ages 1-17), ketamine immediately terminated convulsions in 13, but only mitigated them in 3 patients, two of whom received ketamine IN and one, retrospectively, a likely case of anoxic posturing. There were no concerning ketamine-attributable effects on blood pressure, O_2 saturations or $ETCO_2$ (for both adults and children). Of note, two-thirds of these cases involved women/girls.

Conclusions: Among adults with on-going out-of-hospital seizures resistant to ample dosings of midazolam, ketamine was consistently effective in rapidly terminating those convulsions without any significant attributable complications. Near-similar results were achieved in children/adolescents. Future research should confirm how frequently prehospital termination of convulsions was also associated with termination of seizures (abnormal electrical activity on EEG) as well as eventual outcomes during the hospital course. In addition, these early data from a single center should be validated in other EMS systems, emergency departments and other settings considering the effectiveness shown to date and rapid action.

No, authors do not have interests to disclose

210 Efficacy of Sodium Bicarbonate for Treatment of Acute Peripheral Vertigo: A Double-Blinded Randomized Clinical Trial

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Study Objectives: There have been reports of using sodium bicarbonate (SB) for treating dizziness and vertigo in Asian area. The objective of this randomized clinical trial was to evaluate the efficacy of SB alone and SB combined with antihistamine compared to antihistamine alone for treating acute peripheral vertigo in patients visiting emergency department (ED).

Methods: The study was conducted as a 1:1:1 triple-arm, double-blinded, randomized clinical trial at the ED of National Taiwan University Hospital Yunlin Branch in Yunlin, Taiwan, from January 2023 to December 2023. Patients aged 18 or older who experienced peripheral vertigo onset within the past 24 hours were included in this study. Patients allocated to the standard treatment group (Group A) received 30 mg diphenhydramine intravenously drip. Patients allocated to the intervention groups were treated by SB (Group B) or combination therapy (Group C). Patients in Group B received 66.4 mEq SB administered via intravenously infusion. Patients in Group C received 30 mg diphenhydramine intravenously drip and 66.4 mEq of SB intravenous slowly push for 2 minutes. The infusion was set to complete in 10 to 20 minutes. Primary outcome was the change in vertigo visual analogue scale (VAS) from baseline to the 60th minute after drug administration. Secondary outcomes included the change in vertigo VAS from baseline to the 30th minute, the change in nausea VAS from baseline to the 30th and 60th minutes, the change in vertigo VAS from sitting to turning head and ambulation at the 60th minute. Subjective feeling of ambulation limitation at the 60th minute, ED staying time, treatment-related side effects, and any additional rescue medication administered by emergency physicians after the trial were also recorded.

Results: 283 patients with dizziness or vertigo underwent eligibility assessment, and 225 of them participated in this study. Three participants (1 in group B and 2 in group C) were subsequently excluded from the final analysis due to a diagnosis of central vertigo after randomization. The baseline vertigo VAS scores were 7.79 ± 1.90 for Group A, 8.15 ± 1.57 for Group B, and 8.23 ± 1.54 for Group C. The primary outcomes showed changes in vertigo VAS were -4.44 ± 2.68 for Group A, -5.05 ± 2.22 for Group B, and -5.56 ± 2.10 for Group C ($p = 0.016$; A vs C $p = 0.012$) at 60th minute. The secondary outcomes also revealed significant alterations in vertigo VAS and nausea VAS at 30th minute. At 60 minutes from baseline, there was no significant difference in the change of nausea VAS scores, and there were no significant differences observed in the increase of vertigo VAS scores with head rotation or in subjective feelings of ambulation limitation. Using combination therapy resulted in significantly reduced ED stay times (Group A: 2.3 [1.3], Group B: 2.1 [1.5], Group C: 2.0 [1.2]; $p = 0.030$) and a decreased requirement for additional rescue therapy (Group A: 46.7%, Group B: 33.8%, Group C: 17.8%; $p = 0.001$). Using diphenhydramine caused higher percentage of moderate to severe lethargy (Group A: 40.0%, Group B: 10.8%, Group C: 38.4%; $p<0.001$) while using SB caused higher percentage of discomfort during drug administration (Group A: 8.0%, Group B: 17.6%, Group C: 28.8%; $p=0.004$).

Conclusion: Patients treated with combination treatment had better vertigo VAS reduction at 60th minute. They required less rescue therapy and experienced reduced time spent in the ED. Diphenhydramine may induce lethargy, and the use of SB through injection may cause discomfort.

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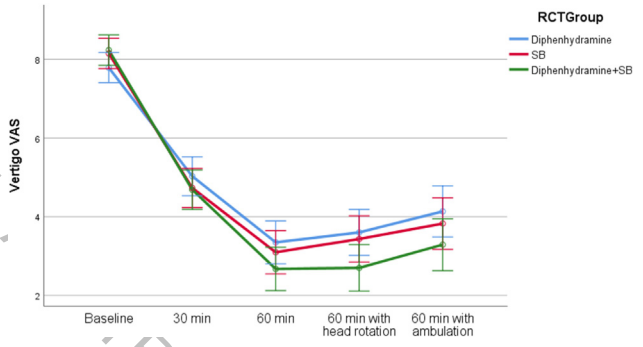

No, authors do not have interests to disclose

211 Comparing Hyperacute Treatments for Patients With Acute Ischemic Stroke: Community Hospital First Versus Direct-to-Comprehensive Stroke Center

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Background: In the US, someone dies from stroke every 3.5 minutes. To prevent this, it is well-described in the literature that time to treatment is critical in mitigating long-term effects. We aimed to assess baseline demographics, treatment modality utilization rates, time to treatment, and patient outcomes across two cohorts. The first cohort includes those patients from Massachusetts EMS Region 5 (who, according to local EMS stroke protocol, bypassed local hospitals and were transported directly to Tufts Medical Center (TMC), a comprehensive stroke center (CSC). The second cohort includes those patients who initially presented to a community hospital (CH) and subsequently were transferred to TMC due to stroke acuity.

Methods: The Tufts Vascular Neurology patient registry was sampled for the years 2018-2022. Only patients with ischemic strokes were included in the analysis, and all patients in this group with an NIHSS < 6 were excluded to ensure comparable level of stoke severity to the intervention group (direct to CSC). Various demographics, stroke risk factors, and NIHSS were summarized between the two cohorts (Community Hospital first patients (n=448) and Direct to CSC patients (n=70)). Chi-square tests were employed to evaluate differences between these summary statistics. Next, various treatment modalities and metrics were assessed via independent-sample t tests. A preliminary clinical outcome measure, 90-day Modified Rankin Scale (mRS), was also analyzed via independent-sample t test.

Results: Direct transport to CSC was associated with shorter "picture-to-puncture" time (time from initial CT to thrombectomy procedure start time) (p=0.029), shorter last known well (LKW) to CSC arrival time (p=0.0508), shorter LKW to recanalization time (p=0.159), and higher rates of thrombolysis (IVtPA) administration (p=0.002). In contrast, direct transport to CSC was associated with longer door to groin puncture and recanalization times (p=0.000, p=0.000), and no significant differences in LKW to IVtPA administration time (p=0.926) or thrombectomy rates (p=0.499). The direct to CSC cohort had a higher proportion of patients with 90-day mRS < 2 (51.4% vs. 33.1%, p=0.042).

Conclusions: We found several associations between direct to CSC and faster treatment times. However, door to groin puncture and recanalization times are shorter for the CH first cohort. This is likely because the thrombectomy team has more lead time to mobilize for transfers from outside hospitals (most of whom are brought directly to the thrombectomy suite) than for patients brought to TMC directly from the field who have to make their way through the ED triage process first. Of note, the primary functional outcome, 90-day modified Rankin Scale (mRS), appeared to demonstrate a benefit in the direct to CSC cohort. A statistically significant higher proportion of this cohort ended up with a 90-day mRS < 2, which is shown in studies to correlate well with maintenance of long-term functional independence. However, it is important to note the limitations of this statistic, namely the many factors that feed into selection bias for those patients who are willing and able to follow-up with care providers for a 90-day assessment. While our sample size is small and more sophisticated statistical analysis is still ongoing, preliminary positive findings warrant repeated studies and further investigation.

Table 1. Demographics and Risk Factors

Values	CH First (n = 448)		Direct to CSC (n = 70)		
	Frequency	Percentage	Frequency	Percentage	p-value
Sex					0.225
Female	246	54.9%	33	47.1%	
Male	202	45.1%	37	52.9%	
Race/Ethnicity					0.013
Non-Hispanic Asian	74	16.5%	3	4.3%	
Non-Hispanic Black/African American	37	8.3%	11	15.7%	
Hispanic	24	5.4%	2	2.9%	
Non-Hispanic White	300	67.0%	50	71.4%	
Other	13	2.9%	4	5.7%	
Risk Factors					
CAD/MI	78	17.4%	12	17.1%	0.956
Hypertension	319	71.2%	55	78.6%	0.201
Hyperlipidemia	211	47.1%	33	47.1%	0.994
Current tobacco use	85	19.0%	18	25.7%	0.189

Table 2. Mean Ordinal Summary Statistics

	CH First (n = 432)		Direct to CSC (n = 70)		
	Mean	St. dev.	Mean	St. dev.	p-value
Age at Time of Episode (years)	70.9	15.4	72.1	14.4	0.529
NIHSS at Presentation	14.5	6.7	14.7	6.2	0.881

Table 3. Treatment Rates and Clinical Outcomes

	CH First (n = 424)		Direct to CSC (n = 69)		
	Frequency	Percentage	Frequency	Percentage	p-value
Treatment					
IVtPA	141	33.3%	36	52.2%	0.002
Thrombectomy	174	41.0%	31	45.6%	0.499
90-day mRS*					0.114
0	13	8.3%	9	25.7%	
1	24	15.3%	5	14.3%	
2	15	9.6%	4	11.4%	
3	39	24.8%	8	22.9%	
4	19	12.1%	2	5.7%	
5	13	8.3%	1	2.9%	
6	34	21.7%	6	17.1%	
90-day mRS (grouped)*					0.042
≤ 2	52	33.1%	18	51.4%	
> 2	105	66.9%	17	48.6%	

* CH first n = 157; Direct to CSC n = 35

Figure 1. 90-Day mRS Outcomes Array by Comparison Group

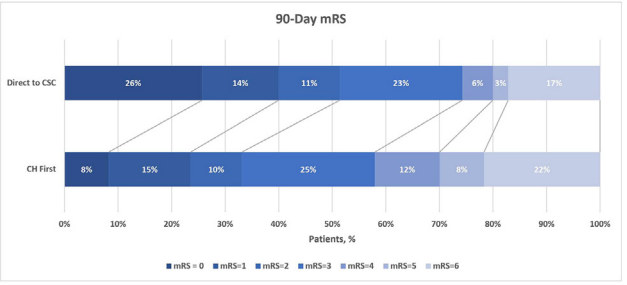

Table 4. Mean Treatment Times

	CH First			Direct to CSC			
Treatment Times (minutes)	n	Mean	St. dev.	n	Mean	St. dev.	p-value
LKW to CSC Arrival time	334	1055.6	2621.2	67	425.7	465.1	0.051
DTN Time at First Site of Care	114	54.8	33.9	34	48.2	33.5	0.325
LKW to IVtPA Administration time	114	185.8	192.0	34	189.2	173.3	0.926
Door to Groin Puncture time	139	42.3	50.2	31	85.0	33.5	0.000
Door to Recanalization time	127	77.6	50.8	30	141.7	62.2	0.000
LKW to Recanalization time	124	571.6	618.6	30	405.0	355.4	0.159
Picture-to-puncture time	130	180.0	309.5	31	56.9	63.3	0.029

No, authors do not have interests to disclose

212 Development of a Clinical Risk Score to Risk Stratify for a Serious Cause of Vertigo: A Prospective Cohort Study

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Study Objectives: Identify high-risk clinical characteristics for a serious cause of vertigo in patients presenting to the emergency department.

Methods:

Design: Multicentre prospective cohort study over 3 years.

Setting: Three university-affiliated tertiary care emergency departments.

Participants: Patients presenting with vertigo, dizziness or imbalance. A total of 2,078 of 2,618 potentially eligible patients (79.4%) were enrolled (mean age 77.1 years; 59% women).

Main outcome measurements: An adjudicated serious diagnosis defined as stroke, transient ischemic attack, vertebral artery dissection or brain tumour.

Results: Serious events occurred in 111 (5.3%) patients. We used logistic regression to create a 7-item prediction model: male, age over 65, hypertension, diabetes, motor/sensory deficits, cerebellar signs/symptoms and benign paroxysmal positional vertigo diagnosis (C-statistic 0.96, 95% confidence interval [CI] 0.92–0.98). The risk of a serious diagnosis ranged from 0% for a score of <5, 2.1% for a score of 5-8, and 41% for a score >8. Sensitivity for a serious diagnosis was 100% (95% CI, 97.1-100%) and specificity 72.1% (95% CI, 70.1-74%) for a score <5.

Conclusions: The Sudbury Vertigo Risk Score identifies the risk of a serious diagnosis as a cause of a patient's vertigo and if validated could assist physicians in guiding further investigation, consultation and treatment decisions, improving resource utilization and reducing missed diagnoses.

No, authors do not have interests to disclose

214 Effectiveness and Safety of Non-Vitamin K Antagonist Oral Anticoagulant Pretreatment Within 48 Hours in Acute Ischemic Stroke Patients Undergoing Intravenous Thrombolysis

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Study Objectives: Current guidelines recommend against intravenous thrombolysis therapy (IVT) for acute ischemic stroke patients treated with non-vitamin K antagonist oral anticoagulants (NOACs) unless test results from an appropriate coagulation measure are normal or more than 48 hours have passed since the last NOAC dose. A critical issue is the limited number of IVT-treated cases with NOAC pretreatmen due to current guidelines restricting IVT in patients treated with NOACs. However, the current evidence is still inconclusive in assessing the safety of IVT use in these patients and is rarely compared to traditional oral anticoagulants (OACs), such as warfarin. Our study aimed to investigate the effectiveness and safety of NOAC pretreatment within 48 hours prior to stroke after IVT, especially in situations where no measurement of plasma drug levels and no use of reversal agents occur, by conducting a network meta-analysis of current studies.

Methods: The Cochrane Library, EMBASE, MEDLINE, and Scopus databases were searched for studies published from inception to December 2024. Observational studies evaluating the effect and safety of NOAC pretreatment within 48 hours among patients treated with IVT for ischemic stroke were included. The primary outcome was the risk of symptomatic intracranial hemorrhage (sICH) within 36 hours after IVT between patients with or without NOAC pretreatment. Other outcomes included functional outcomes, any type of intracranial hemorrhage (ICH), major bleeding, and mortality. The functional outcome was defined by the modified Rankin Scale (mRS), which was measured at the longest observational time in each study. Frequentist network meta-analyses were performed to compare the effect and safety of NOAC pretreatment, warfarin pretreatment, and no use of anticoagulants (no-OAC) prior to IVT by using a random-effects model. The relative ranking of agents was conducted using P-score probabilities.

Results: A total of 10 trials with 112,236 patients treated with IVT for acute ischemic stroke were included, among whom 446 (0.4%) were pretreated with NOACs without plasma drug level measurement or the use of reversal agents, 3,260 (2.9%) were pretreated with warfarin, and 108,569 (96.7%) were without OACs. In the primary outcome, patients pretreated with NOACs did not have significantly higher risks of sICH compared to those pretreated with warfarin (pooled OR, 0.52 [95% CI 0.19 to 1.44]) and those without OACs (pooled OR, 0.66 [95% CI 0.26 to 1.70]) after combining direct and indirect evidence through a random-effects model network meta-analysis. There were no significant differences in the secondary safety outcomes, including mortality (pooled OR, 0.50 [95% CI, 0.18 to 1.34] in NOACs vs warfarin; pooled OR 0.47, [95% CI, 0.17 to 1.28] in NOACs vs no OACs). In the ranking of safety outcomes, NOAC pretreatment was identified as having the lowest risks of sICH (P-score = 0.91) and mortality (P-score = 0.92) across all groups. For the secondary functional outcome, patients pretreated with NOACs tended to achieve better functional outcome (mRS ≤2) after IVT, compared to those pretreated with warfarin (pooled OR, 1.25 [95% CI 0.92 to 1.69]), and those without OACs (pooled OR, 1.29 [95% CI 0.99 to 1.68]), but there were no statistically significant differences. NOAC pretreatment was ranked as the best for functional outcomes (P-score = 0.95).

Conclusions: In the network meta-analysis, compared to no treatment with anticoagulants, treatment with NOACs prior to stroke was not associated with a higher risk of sICH, major bleeding, or mortality in patients receiving IVT for acute ischemic stroke.

No, authors do not have interests to disclose

215 Ultrasound-Guided Erector Spinae Plane Block for Breakthrough Cancer Pain in the Emergency Department: Case Series

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Study Objectives: Chronic pain is common for patients living with cancer and is challenging to manage as there are multiple contributory factors, including stage and anatomic location. A recent meta-analysis of 444 studies revealed a 44.5% prevalence in overall pain with a 30.6% prevalence of moderate to severe pain. Between 2011-2015, a study of several hospitals in the United States showed that 66% of patients with cancer admitted for pain management stayed in the hospital for over 72 hours, with a median cost of $48,156 per admission. The erector spinae plane block (ESPB), first described in 2016, is a novel ultrasound-guided procedure that has demonstrated efficacy in treating neuropathic, visceral, and musculoskeletal pain. Some emergency physicians have begun to utilize this block as an alternative or adjunct to opioids in treating acute pain. There is, however, an absence of literature describing the use of ESPB in the emergency department (ED) for cancer-related pain. This case series is the first to do so, showcasing a marked and sustained reduction in pain for patients with abdominal cancer involvement.

Methods: Data were collected via chart review for three patients with metastatic cancer, including colon (52-year-old female), rectal (44-year-old male), and pancreatic (63-year-old female). Each patient presented to the ED reporting ≥7/10 pain that was refractory to their home pain regimen. All three patients initially received intravenous hydromorphone and, two to three hours later, developed significant pain again. At this point, the patients were offered bilateral ESPB at a sensory level chosen based on location of pain. The patient with colon cancer received a bilateral ESPB using 20ml of 0.25% bupivacaine per side at L1. The other two patients received the same amount of anesthetic with an additional 10mg of dexamethasone at L1 for the patient with rectal cancer and at T6 for the patient with pancreatic cancer. Visual Analog Scale (VAS) scores were collected pre- and post-procedure.

Results: The patient with colon cancer had a 100% reduction in pain 30 minutes post-procedurally. She did not require any additional opioids until 17-hours after the procedure, at which point she was restarted on her home regimen and discharged that evening. The patient with rectal cancer had a 75% reduction in pain 30 minutes post-procedurally. He was discharged from the ED and, in a 24-hour follow-up phone-call, reported 80% improvement of pain. The patient with pancreatic cancer had a 66% reduction in pain 15 minutes post-procedurally. She was discharged the following day without requiring additional opioid medications.

Conclusion: The bilateral ESPB is a safe ultrasound-guided procedure that can be performed in the ED. Our findings suggest that this block may break the acute pain response in patients with breakthrough intra-abdominal cancer pain, expediting the bridge back to their home regimen. The addition of dexamethasone may further extend block efficacy time which can serve as an opioid holiday, allowing patients relief from opioid side effects such as central nervous system depression and constipation. Furthermore, the ESPB may reduce length of hospitalization and even promote discharge from the ED altogether.

No, authors do not have interests to disclose

216 Cancer Pain in the Emergency Department: What Role Does Compassion Play?

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Study Objectives: Pain in the most common reason for patients with cancer to seek care in the emergency department (ED). Unfortunately, given the complex and multifaceted nature of cancer pain, it can often be difficult to manage, especially in the often chaotic and fast-paced environment of the ED. Predominantly outside of the emergency medicine literature, pain researchers have investigated the interplay between

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self-compassion, provider compassion and the perception of chronic pain, as well as its responsiveness to analgesia. We designed this study to investigate the relationship between compassion and cancer pain in the ED setting.

Methods: This is a survey-based, prospective cohort study investigating cancer pain outcomes in the ED and the relationship between pain and compassion. We enrolled a convenience sample of ED patients presenting to a tertiary, academic ED affiliated with an NCCN designated cancer center. We utilized validated scores including the pain catastrophizing scale (PCS), the pain anxiety symptoms scale (PASS), and the self-compassion scale (SCS). We asked the treating physician to rate their level of compassion for their patient on a scale from 0-10. We followed up with patients 1 week after their ED visit to assess the perception of provider compassion using the Schwartz Center Compassionate Care Scale (SCCCS). We report descriptive statistics and utilize the two-tailed T test to compare means among groups.

Results: In this preliminary study, we enrolled 32 patients from 12/01/23 to 04/11/24. Approximately 2/3 of the patients were female, with a mean age of 61. A majority of the enrolled patients were white (58%), followed by black (19%) and Asian (7%). Overall, patients experienced a low amount of pain catastrophizing (median 16/max possible 52), a low amount of pain anxiety (median 37/max possible 100), and maintained a low-moderate amount of self-compassion (median 24/max possible 60). In general, patients perceived their physicians to be highly compassionate (median 111/max 120), which correlated to the physicians' perception of compassionate care (median 8/max possible 10). However, mean pain levels for patients that rated their physician's compassion level as <100 on the SCCC were statistically higher both during their ED visit (6.78 vs 3.67, p=.011) and follow-up one week later (5.38 vs 3.18, p=.019) when compared to patients who rated their physicians as more compassionate (100 or above).

Conclusions: Although ED patients with cancer that experience pain appear to have moderately low self-compassion, the amount of pain catastrophizing and pain anxiety is relatively low. Additionally, while most patients rated their physicians as having high levels of compassion, we noted significantly higher pain levels both in the ED and after discharge, for those patients that rated their physician's compassion as moderate to low. These findings suggest that the perception of physician compassion may be associated with pain severity. This is an area that we plan to investigate further as we continue to enroll patients in this prospective study.

No, authors do not have interests to disclose

217 Evaluating the Safety of Ketamine-Dexmedetomidine (Ketodex) Versus Ketamine-Propofol (Ketofol) Combination in Adults Undergoing Procedural Sedation: An Updated Systematic Review and Meta-Analysis of Randomized Controlled Trials

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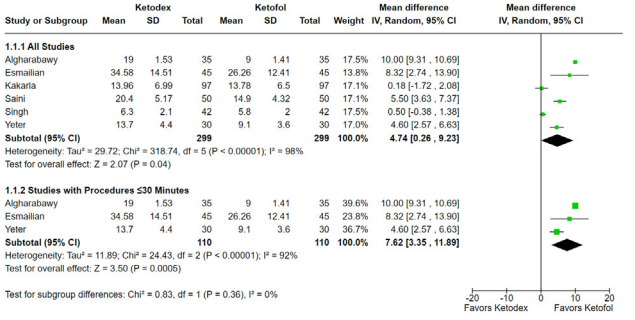
Study Objective: In procedural sedation, selecting the most appropriate medication regimen is crucial for ensuring patient safety and optimizing outcomes. This analysis intends to determine which combination offers a superior overall safety profile to guide clinical decision-making. We aimed to perform a meta-analysis assessing the safety of Ketamine-Dexmedetomidine (Ketodex) versus Ketamine-Propofol (Ketofol) in adult patients undergoing procedural sedation.

Methods: We systematically searched PubMed, Embase, Web of Science and Cochrane databases for randomized controlled trials (RCTs) comparing Ketodex and Ketofol from inception to January 16, 2024. Quality assessment was performed per Cochrane recommendations. We pooled risk ratios (RRs) and mean differences (MDs) with 95% confidence intervals (CIs) across trials using a random-effects model. The study was pre-registered on Prospero (#CRD42024502717) and followed PRISMA reporting guidelines. Cochrane Review Manager Web was used for statistical analysis. Among the outcomes of interest were recovery time, hypotension, bradycardia, oxygen desaturation/hypoxia, and nausea and/or vomiting.

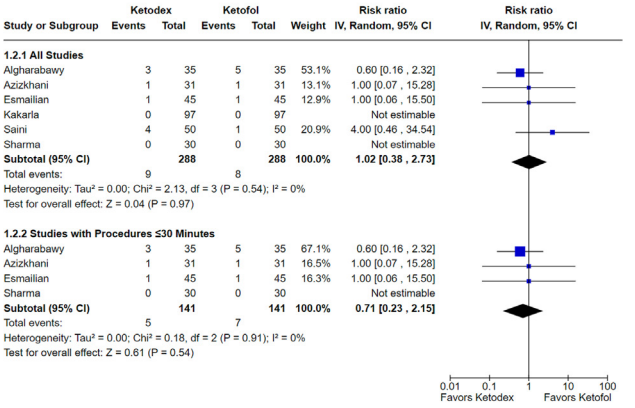
Results: Our search yielded 1,475 results. Ultimately, twelve RCTs comprising 987 patients were included. Of those, 493 received Ketodex and 494 received Ketofol. Overall, Ketofol had shorter recovery time (MD 4.74 minutes; 95% CI 0.26-9.23; p<0.00001; I2=98%; Figure 1). There were no statistically significant differences in hypotension (RR 1.02; 95% CI 0.38-2.73; p=0.54; I2=0%; Figure 2), bradycardia (RR 2.06; 95% CI 0.87-4.89; p=0.89; I2=0%; Figure 3), oxygen desaturation/hypoxia (RR 0.81; 95% CI 0.60-1.10; p=0.38; I2=6%; Figure 4), and nausea and/or vomiting (RR 1.59; 95% CI 1.04-2.43; p=0.69; I2=0%; Figure 5). A subgroup analysis of studies with procedures that last 30 minutes or less, including emergency department procedures such as chest tube insertion, was performed. The results showed that Ketofol had shorter recovery times (MD 7.62 minutes; 95% CI 3.35-11.89; p<0.00001; I2=92%; Figure 1). No statistically significant difference was found for the remaining outcomes.

Conclusion: Ketofol offers a slight advantage in terms of recovery time when compared to Ketodex. However, both regimens have a similar safety profile in terms of hypotension, bradycardia, oxygen desaturation/hypoxia, and nausea and/or vomiting. The choice between Ketofol and Ketodex should be tailored to the specific needs of the procedure and the patient's medical history, ensuring optimal outcomes with minimal risks.

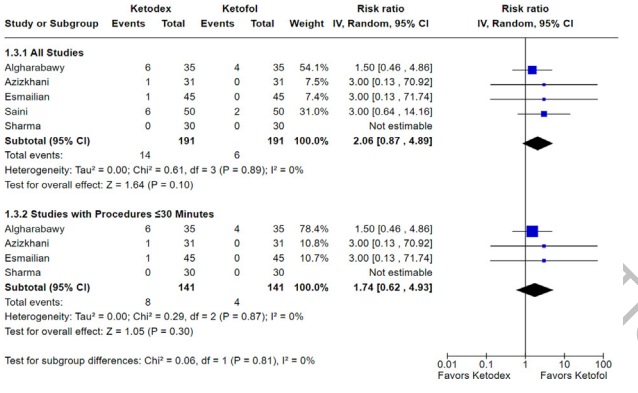
Recovery Time (Figure 1)



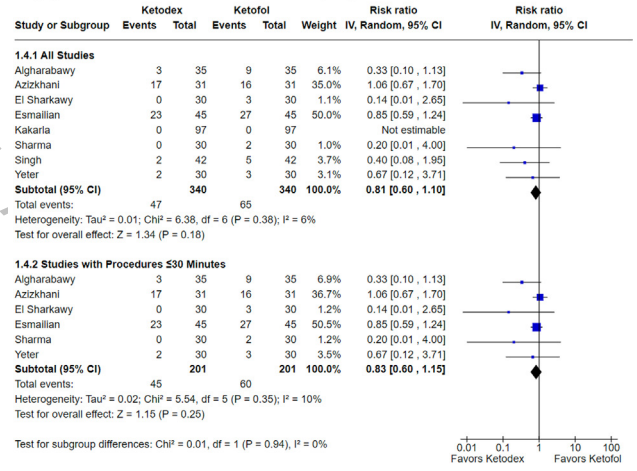
Hypotension (Figure 2)



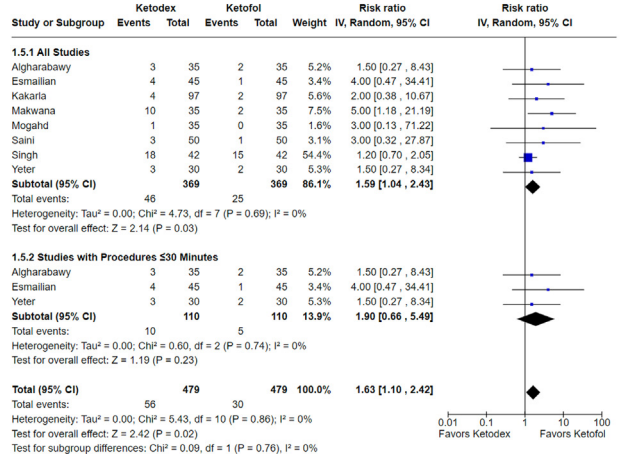
Bradycardia (Figure 3)



Oxygen desaturation/hypoxia (Figure 4)



Nausea and/or vomiting (Figure 5)



No, authors do not have interests to disclose

218 Pain Trajectories Following an Emergency Department Visit and Chronic Pain

Abril L, Abril B, Pacheco F/Montefiore Medical Center, Bronx, New York, US

Study Objectives: Inadequate management of pain can reduce quality of life, induce unnecessary suffering, loss of productivity, and increased use of healthcare resources due to chronic pain. The recent well-documented spike in opioid use has roots in an increased awareness of undertreated pain, a problem yet to be solved even as limitations of opioids are increasingly understood. The goal of this project was to determine the frequency with which pain intensity trajectories two weeks after an emergency department (ED) visit transitions to chronic pain.

Methods: This was a prospective observational cohort study performed in two EDs in New York City. Adults with acute or chronic pain of sufficient severity to require an oral opioid prescription at discharge were included. Chronic pain was defined as any pain experienced for more than 50% of the days in the preceding 6 months. Exclusion criteria were any use of opioids, including tramadol within the previous six months, use of non-prescription opioid, illicit opioid use or hospital admission during the index visit. Research associates interviewed patients during the ED visit, two weeks and six months later by structured telephone interview. Logistic regression models were constructed to evaluate the association between persistent pain two weeks after an ED visit with chronic pain while adjusting for demographic variables.

Results: During a 29-month period, 701 patients were approached for participation and 699 met inclusion criteria and consented to participate. 653/699 (93%) provided two weeks outcome data and 599/699 (86%) provided six-month outcome data. The extremities were the most common source of pain (305/699, 44%), followed by neck and back (149/699, 21%) and abdomen-pelvis (131/699, 19%). Two weeks after ED visit, 296/653 (45%, 95% CI: 42, 49) patients reported moderate to severe pain in the affected area. Six months after ED visit, 120/599 (20%, 95% CI: 17, 23) patients reported moderate to severe pain in the affected area at least once during the preceding week. Chronic pain was reported by 151/562 (27%, 95% CI: 23, 31) patients. Presence of moderate to severe pain two weeks after ED visit was associated with moderate to severe pain at 6 months (OR 3.11, 95% CI: 2.02, 4.79) and with chronic pain (OR 2.52, 95% CI: 1.71, 3.73).

Conclusion: Approximately $^{1}/_{4}$ of patients who present to the ED with pain report development of chronic pain in the affected body region 6 months later. Persistence of pain two weeks after the ED visit was associated with development of chronic pain. Screening for persistence of pain two weeks after the ED visit may be a useful method to target more comprehensive therapy to those acute pain patients most likely to transition to chronic pain.

BASELINE VARIABLES	
Age (years)	
18-44	310 (44%)
45-64	286 (41%)
≥65	103 (15%)
Gender	
Male	310 (44%)
Female	389 (56%)
Location of Pain	
Extremity	305 (44%)
Neck and back	149 (21%)
Abdomino-pelvic	131 (19%)
Face	70 (10%)
Chest	38 (5%)
Headache	6 (1%)
Opioid prescribed	
Oxycodone-acetaminophen	570 (82%)
Codeine-acetaminophen	123 (18%)
Hydrocodone-acetaminophen	1 (0.1%)
Morphine	5 (1%)
Morphine milligrams equivalents dispensed, median (IQR)	50 (25, 75)

TWO WEEK OUTCOMES	
Worst pain in affected area during previous 24 hours	
Severe	104 (15%)
Moderate	192 (28%)
Mild	167 (24%)
None	190 (27%)
Missing	46
Pain frequency in affected area during previous 24 hours	
Often/ Always	222 (32%)
Sometimes	179 (26%)
Never/ Rarely	253 (36%)
Missing	45

SIX MONTH OUTCOMES	
Worst pain in affected area during previous week	
Severe	36 (5%)
Moderate	84 (12%)
Mild	111 (16%)
None	368 (53%)
Missing	100
Pain frequency in affected area during previous week	
Often/ Always	91 (13%)
Sometimes	101 (14%)
Never/ Rarely	402 (58%)
Missing	105

No, authors do not have interests to disclose

219 Comparison Between Ultrasound-Guided Femoral Nerve Blocks and Pericapsular Nerve Group (PENG) Block Among Patients With Intracapsular Hip Fractures

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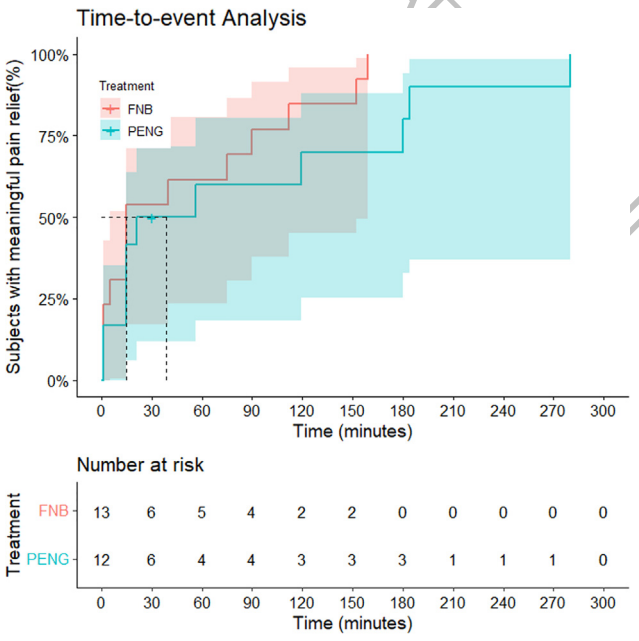
Background: Intracapsular hip fractures occur within the capsule of the hip joint and are typically associated with disruption of blood supply to the femoral head. A peripheral nerve block can be an effective option for pain management in these cases.

The study aim is to provide statistical evidence to compare ultrasound-guided femoral nerve block (FNB) and pericapsular nerve group (PENG) block in patients with intracapsular hip fracture.

Methods: A single-center retrospective observational study was conducted, including adult patients presenting with acute intracapsular hip fractures in the emergency department between January 1, 2020, and August 30, 2021. The primary outcome measure was pain relief, assessed using the pain-intensity difference (PID) immediately after blocks and at 15, 30, 60, and 120-minute post-dose time points. Meaningful pain relief was defined as PID ≥ 4, which has been previously demonstrated to represent the clinically important measure of pain outcomes. Other key outcomes included the amount of rescued opioid use, duration of emergency department stay, and duration of hospital stay. The data were evaluated using a time course analysis, time-to-event analysis (time to meaningful pain relief), and multivariable analysis.

Result: In this study, 25 adult patients with intracapsular hip fractures were divided into two groups: one receiving PENG block (n=12) and the other receiving FNB (n=13). In time-to-event analysis, both groups reported similar reductions in pain levels (hazard ratio: 0.90, 95% confidence intervals: 0.28–2.91, p = 0.86). In secondary outcome, there were no significant variations between the groups in terms of opioid use for rescue analgesia, length of stay in the emergency department, or duration of hospitalization.

Conclusion: Previous evidence has suggested that the PENG block is superior to the FNB for pain reduction in patients with intracapsular hip fractures. However, our study found no significant differences in the efficacy of FNB and PENG block as regional analgesic techniques in this patient population.



No, authors do not have interests to disclose

220 Emergency Department Readmission Rates for Patients Diagnosed With Renal Colic and Discharged With or Without Narcotic Prescriptions

Eskin B, Khanzada H, Wiener D, Allegra J, Fox P/Morristown Medical Center, Morristown, New Jersey, US

Study Objectives: An important goal for emergency department (ED) patients with renal colic is pain control. Nonsteroidal anti-inflammatory drugs (NSAIDs), like ketorolac, provide excellent analgesia and most patients are instructed to use NSAIDs on discharge. Nonetheless, emergency medicine textbooks and practice guidelines suggest considering adding narcotic medication prescriptions as "rescue" medications. However, narcotics have risks, including side effects, misuse, and even addiction. One measure of the success of treating the pain of discharged renal colic patients is the rate of return visits to the ED. We hypothesize that renal colic patients prescribed narcotics would have a lower rate of return visits to the ED.

Methods: *Design:* Retrospective cohort. *Population:* Patients diagnosed with renal colic from 1/1/2020 through 12/17/2023. *Setting:* a suburban ED with 110,000 annual visits. *Data Analysis:* We identified renal colic patients by their discharge diagnosis of renal or ureteral colic. We tallied the number of visits, whether or not each patient was prescribed narcotic pain medication on the initial visit, and whether the patient returned to the ED within 23 days for renal colic. (Other studies have shown that most kidney stones pass within 23 days.) We tallied baseline demographic data, including initial and final pain scores (on a 0-10 scale, routinely recorded by nursing). We calculated differences in rates of return visits with 95% confidence intervals (CIs) between patients given and not given narcotic prescriptions at the first visit.

Results: The database contained 1,116 initial visits, of which 53 did not have any pain scores recorded, leaving 1,063 patients for analysis. Of these, average age was 51 +/- 16 years, 34% were female and 645 (61%) received narcotic prescriptions on discharge. For the 182 (17%) patients that returned for renal colic within 22 days, median time to return was 3 days (interquartile range: 1, 7 days). The baseline characteristics of the 2 groups, are similar, as shown in the Table. IntblI particular, renal colic patients prescribed narcotics during the first visit had clinically similar pain scores to those not prescribed narcotics: The differences in mean initial and final pain scores were 0.4 and 0.5, respectively, whereas a minimally clinically significant difference in pain scores is usually considered to be 1.3 on a 10-point scale. The return rate for those discharged with narcotic prescriptions on the first visit was 14.5% and for those without narcotic prescriptions, 7.9%, a statistically significant difference of 6.6% (95% CI: 3.1%, 10.1%), with a ratio of 14.5%/7.9% = 1.84. Of the narcotic prescriptions given on the first visit, 88%, 6% and 4% were for oxycodone/acetaminophen, oxycodone and tramadol; for those who returned, these numbers were 83%, 10% and 5%, respectively.

Conclusion: ED patients discharged with narcotic prescriptions had similar baseline characteristics as those not given narcotic prescriptions, but, contrary to our hypothesis, were almost twice as likely to return to the ED. Narcotic prescriptions for these patients is usually not necessary and may actually be deleteriousl

TABLE: Characteristics of Patients With and Without Narcotic Prescriptions

	Patients with narcotic prescriptions	Patients without narcotic prescriptions
Mean age (years) +/- SD*	53 +/- 14	49 +/- 17
Percent female	32%	35%
Mean initial pain score +/- SD*	7.6 +/- 2.3	7.2 +/- 2.5
Mean final pain score +/- SD*	2.7 +/- 2.5	2.2 +/- 2.4

*SD, standard deviation

No, authors do not have interests to disclose

221 Opportunities for Antibiotic Stewardship for Pediatric Urinary Tract Infection for Outpatient Emergency Department and Urgent Care Encounters

Prasher P, Yeager K, Vaidya V, Joseph M, Bain I/Phoenix Children's Hospital, Phoenix, Arizona, US

Background: Urinary tract infections (UTI) are common causes of bacterial infections that require antibiotics. Typically, urinalysis (UA) or urine dipstick (UDip) results determine whether antibiotics are prescribed for suspected UTI. No tools were in place at our center to de-escalate or discontinue antibiotic therapy when urine culture results were negative in the emergency department (ED) or urgent care (UC). We recently instituted a dashboard to review patients with negative cultures and communicate with families to discontinue antibiotics when appropriate.

Study Objectives: Our primary objective is to suggest opportunities for antibiotic stewardship at a large pediatric center in patients with suspected UTI that are prescribed an antibiotic but have negative urine cultures. The secondary objective is to describe prescribing patterns based on UDip or UA results, history and exam, diagnosis, antibiotic choice or duration, location of service and provider role.

Methods: This retrospective chart review included patients over 60-days-old presenting to our ED or UC between August 1, 2021-July 31, 2023, had a urine culture, and were prescribed antibiotics. We randomly selected a cohort of patients from this group and compared them to a group of patients with negative cultures who did not receive antibiotics to identify factors more often associated with an antibiotic prescription.

Results: Before implementing our dashboard, 26,505 urine cultures were collected in total. 88% were negative (no growth, mixed flora without a predominant organism, or < 50,000 cfu/mL of an organism). 3,971 cultures (15%) were associated with an antibiotic prescription, with 2,600 of these patients (65%) having negative cultures. Chart review of the two cohorts revealed patients discharged with antibiotics were more often prescribed Cephalexin (63.4%) compared to other antibiotics. The average duration was 8.8 days (SD 1.7) with 63% of prescriptions being for a 10-day course. 51.5% patients in the antibiotic group were diagnosed with UTI, and <3% had a cystitis or pyelonephritis diagnosis. A higher likelihood of antibiotic prescription was seen with presence of white blood cells (wbc) or bacteria on UA, urinary symptoms (dysuria or frequency), diagnoses other than UTI (otitis media or strep pharyngitis), and prescriber role (PA, NP), with p-values < 0.05.

Conclusion: Chart review revealed many urine cultures being ordered annually, most of which result negative. Most patients prescribed antibiotics during our study period subsequently revealed negative cultures not requiring antibiotic therapy, supporting our interventions for notifying families to stop antibiotics for negative cultures. There appears to be an association between certain factors and increased likelihood of patients being discharged with antibiotics, including urinary symptoms, WBC or bacteria on UA, and role of advanced practice provider (APP). This indicates educational opportunities exist in improving diagnostic accuracy and treatment of suspected cystitis, UTI, or pyelonephritis to decrease patient exposure to unnecessary or prolonged antibiotic courses. Of note, at our institution APPs see more of our UC and low-acuity ED patients compared to physicians. We believe there may be further educational opportunities available in this provider population to standardize a shorter antibiotic course for simple cystitis, or while awaiting culture results for isolated pyuria.

No, authors do not have interests to disclose

222 Prevalence of Gender Identity and Dysphoria in Adolescent Patients Presenting to a Pediatric Emergency Department With Positive Behavioral Health Screens

Waddell R, Spiro D, Howard L, Niemyer J, Spray B, Crawley L, Miner S, Ganucheau L, Garg V/University of Arkansas for Medical Sciences and Arkansas Children's Hospital, Maumelle, Arkansas, US

Study Objectives: The prevalence of gender identity and sexual orientation in the adolescent population presenting to the pediatric emergency department (PED) for mental health concerns is unknown. These populations are at higher risk for mental health issues and suicidality. The aim of the study is to determine the prevalence of gender dysphoria in children with positive behavioral health screens that present to the PED.

Methods: The study is a prospective analysis that evaluates individuals who present to the pediatric emergency department with a positive behavioral health screener upon arrival. Once identified, these individuals are approached with an anonymous electronic survey with questions related to non-identifiable patient demographics, gender identity, and sexual orientation. The Gender Preoccupation and Stability Questionnaire-2 (GPSQ-2) was utilized to identify gender dysphoria. An a priori sample size of 98 patients was estimated based on a prevalence of gender dysphoria of 10%, a 90% CI, and precision of estimate of .05.

Results: Study enrollment is in process. In our interim analysis, 45 of the 65 adolescents approached have completed the survey. Of the 45 patients, 17% identified as a gender that is not congruent with their assigned sex at birth and 15% have thought about their gender over the last two weeks. 11% responded that their gender identity has affected everyday activities such as school, work, recreation, or purchases. To date, 48% of respondents to the survey identified other than heterosexual.

Conclusion: This is the first known study indicating that gender identity and gender dysphoria have a high prevalence in the adolescent population presenting to the PED with behavioral health concerns. Further research is necessary to understand the significance of these findings.

No, authors do not have interests to disclose

224 Equity in Timely Pediatric Pain Control With a Triage-Initiated Nursing Protocol

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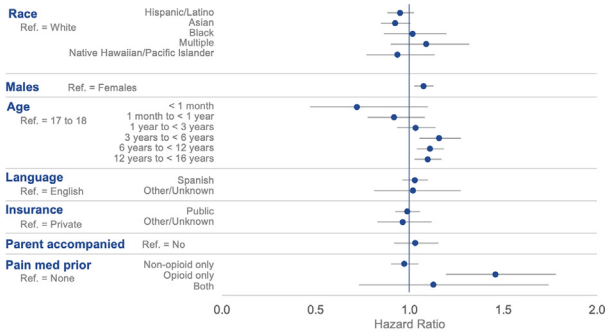
Background: Studies have shown practice variation in pain management for pediatric emergency department (PED) patients, suggesting socio-demographic inequities in care. Our PED has implemented a triage protocol that aims to standardize practice by enabling nurses to administer pain medication, including opiates, with only a verbal physician order. Following this change, we sought to identify any differences by patients' socio-demographic characteristics in 1) whether any pain medication was ordered for patients with pain, and 2) if so, whether it was an opioid.

Methods: In this retrospective cohort study, we included patients who visited our PED from November 2019 to August 2022 and who reported moderate to severe pain at triage of ≥ 5 on a 0-10 pain scale. We built a multivariable model predicting receipt of any pain medication by age, sex, race/ethnicity, preferred language, insurance status, and two variables new to this literature: whether accompanied by parent, and pain medication received before arrival. Our second model used the same variables to predict the receipt of an opioid, among patients receiving any pain medication. Both models controlled for pain severity, acuity level, and if the patient had fever, since medications for analgesia and antipyretic are the same for this patient population.

Results: The study sample included 7,762 patients. Among those, 2,811 received any triage pain medication, of whom 702 received an opioid. In both models, we found no significant associations with race/ethnicity, preferred language, or accompaniment by parent, suggesting consistent practice. However, we found small yet significant associations with sex: males were 1.1 times as likely as females to receive any pain medications. Among those receiving a pain medication, males were 50% more likely to receive an opioid. Compared to patients aged 16-18, patients aged 3-15 were slightly more likely to receive any pain medication. Yet, overall, age was not associated with receipt of opioids. Patients with public insurance were no more likely than those with private insurance to receive pain medications. However, those who received pain medications were 40% less likely to receive an opioid. Receiving pain medication prior to arrival was strongly and positively related to higher likelihood of receiving any pain medication during the encounter, as well as receiving an opioid (Figure).

Conclusion: Given expectations from the literature, we appreciate finding no practice variation by race, ethnicity, or preferred language. We suspect controlling for the receipt of pain medications prior to arrival adjusted for previously observed demographic imbalances. We, however, observed small associations still favoring males and the privately insured. This suggests that the triage pain protocol may support equitable pain control management in other PEDs.

Figure 1 – Forest plot for likelihood of receiving any pain medication by subgroup.



Caption: Our hazard ratios show no statistically significant differences in pain medication reception by race, preferred language, or accompaniment by parent, compared to the reference categories shown.

No, authors do not have interests to disclose

225 Spatial Clustering and Socioeconomic Correlates of Opioid Overdose Deaths in West Virginia

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Study Objectives: According to the US Census Bureau, West Virginia is the 5th poorest state in the country, with a poverty rate of 17.1%. McDowell was the third

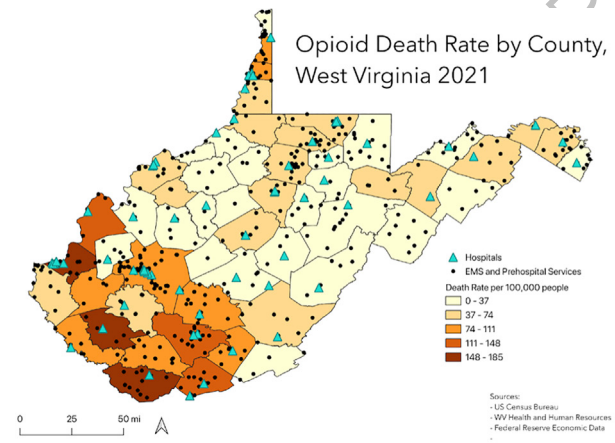
poorest county in the US in 2020. Although WV adopted Medicaid expansion policies in 2014, it still faces the highest drug related mortality in the country. In 2021, 1,253 people died from opioid overdose in WV. The rise in the opioid epidemic has significantly decreased life expectancy in WV, and this problem has been worsening over the past two years, especially in context of the pandemic and the increasing rates of fentanyl in the region. To understand this concerning trend, we conducted a geospatial analysis examining sociodemographic factors and death rates in relation to pre-hospital emergency services and hospital availability.

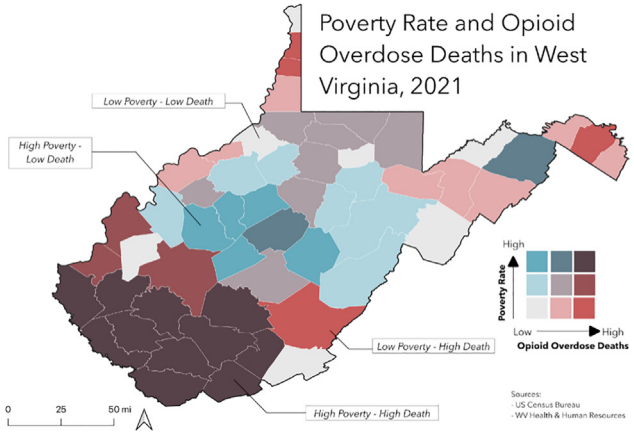
Methods: Data on opioid overdose deaths (OOD) were obtained from the West Virginia Health and Human Resources Bureau for Public Health for 2021. Median income and population county-level data were acquired from the US Census Bureau. Data processing and integration were conducted using Microsoft Excel and QGIS software. Spatial clustering analysis was performed with GeoDa to calculate the Moran's I statistic. Subsequently, the maps were generated using QGIS. Finally, a bivariate analysis was conducted within QGIS to explore the association between poverty rates and OOD.

Results: Our analysis revealed that OOD appears to be spatially clustered, with the highest rates concentrated in southern counties. Furthermore, OOD dramatically increased between 2016 and 2021 across most of the state, with the highest rates seen in the southeastern region. The bivariate analysis reveals a strong association between the poverty rate and OOD. However, hospital location and EMS presence did not appear to be associated with OOD rates.

Limitations: Some important information like EMS response time and naloxone availability by region is not included due to limitations in publicly available data. The distribution of medication assisted treatment facilities are not included due to limitations in data availability.

Conclusions/Implications: McDowell County exhibited the highest opioid overdose death rates and OOD increases in West Virginia. Future research should investigate the underlying factors contributing to these disparities to inform targeted interventions at reducing OOD.





No, authors do not have interests to disclose

226 Prevalence of People With HIV Visiting the Emergency Department and Linkage to Care Status

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Study Objectives: Emergency department (ED) screening for HIV is part of a larger effort to end the HIV epidemic. Identifying new cases of HIV and linking them to care is crucial, however, equally important is the effort to ensure people with HIV (PWH) not in care are linked to care. Due to complicating social determinants of health, the ED is potentially an important setting for re-linking PWH to care. In this pilot study, we intend to determine the number of PWH visiting the ED and their linkage to care status. We hypothesize a substantial number of PWH visiting the ED are not linked to care and present an opportunity to be re-linked to care as part of a larger public health intervention to end the HIV epidemic.

Methods: To identify PWH visiting the ED we performed a retrospective chart review of ED visits at a single urban tertiary care hospital from November 2023 through March 2024. For all ED visits, the electronic medical record (EMR) was queried, and patients were included if there was a previous diagnosis of HIV in the past medical history, problem list, or if a previous positive lab value for HIV-1 antibody was present. Patients were determined to be linked to care if they had a clinic visit or HIV related lab values in the past year, if not, then they were determined to be not in care. Records were reviewed using the local EMR, Care Everywhere and by consulting with the Michigan Department of Health and Human Services. For patients with repeat visits, their first ED visit became the index visit for retrospective review. Patient demographics and HIV viral loads were recorded.

Results: During the review period, 305 unique PWH visited the ED for a total of 577 encounters and of these patients, 238 (78%) patients were linked to care of which 67 patients (22%) were not in care. The majority of patients were male (76.1%) and Black (86.6%). Of the 133 patients linked to care within our health system, 19 (14.3%) had HIV viral loads (VL) > 200 copies/mL. Of the 67 patients not in care, 8 had no previous record for VL, 5 had undetected VL, and another 5 had VL < 30 copies/mL. Of the remaining 49 patients, the average viral load was 106,396.8 copies/mL.

Conclusion: Ending the HIV epidemic will take efforts from multiple stakeholders, including ED HIV screening programs. The prevalence of PWH presenting to EDs is not well described in the literature. Our results suggest the ED may be an important setting and opportunity to reconnect PWH to care. These efforts could be a natural adjunct to ED based HIV screening programs.

No, authors do not have interests to disclose

227 Assessing the Quality of YouTube Videos on Cannabinoid Hyperemesis Syndrome

Pham H, Finedore M, Skovira C, Dean L, Vu A, Sargent J, Kolacki C, Jones J/MSU College of Human Medicine, Grand Rapids, Michigan, US

Study Objectives: The most common adverse effect from marijuana is the cannabinoid hyperemesis syndrome (CHS). These individuals frequently undergo costly medical tests, may even require hospitalization for symptom management, and often face significant delays in getting a diagnosis. Video-sharing platforms are a popular means of communication that reaches a wide audience. However, there is limited information available on recognizing and treating CHS in these videos. Many posts lack warnings or precautions related to the condition. The aim of this study is to assess the quality and educational value of YouTube videos addressing CHS.

Methods: This was a retrospective content analysis of videos using YouTube's search engine to identify videos relating to CHS over a 6-month study period. A standardized data abstraction form was used to collect qualitative and quantitative variables, including the number of views, and the accuracy of the information provided. The medical claims made by the videos will be classified as substantiated or unsubstantiated using opinions of two board-certified toxicologists. The major study endpoint was the total number of videos that clearly and accurately describe CHS, including risks and complications. Descriptive statistics (frequency tables, confidence intervals) were used to summarize the data.

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Results: During the study period, a total of 100 YouTube videos relating to CHS met the inclusion criteria. The mean video length was 7.8 +/- 4.1 minutes (range, 1 to 17.3 minutes). These videos were collectively viewed 387,200 times with an average of 3,872 views per video. Educational material was demonstrated by a live individual in 77%; animation in 20% and photographs in 3%. Character videos were typically narrated by Caucasian males (70%) or females (15%). Overall, 35% of the videos were classified as useful; 46% were not useful; and 19% were misleading. Misleading claims were that CHS is a myth, it is only caused by contaminated cannabis, hot showers cure CHS, CHS is rare, only heavy users get CHS, any vomiting with cannabis use is CHS, and that there is a medicine to cure CHS. All the videos were found to be lacking important information, involving diagnosis, treatment, prevention, complications, and when to seek medical care.

Conclusions: Social media videos about CHS can be valuable tools for education, awareness, and support. However, viewers should approach them with a critical eye, verify information from reputable sources, and consult healthcare professionals for any medical concerns. Balanced and evidence-based content is essential to ensure that these videos serve their intended purpose of educating and supporting individuals affected by CHS.

No, authors do not have interests to disclose

228 HIV Screening in a Sampling of U.S. Emergency Departments, 2022-2023

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Study Objectives: To characterize U.S. emergency departments by whether they do (or do not) routinely screen for HIV and explore factors associated with HIV screening.

Methods: The National Emergency Department Inventory-USA was used to survey a random 5% sampling of all emergency department directors in the U.S. This included characterizing the availability of and preference for 11 preventive health services (including routine non-employee needle-stick HIV screening), identifying department- and patient-level characteristics, and describing directors' perceptions on implementing preventive services. Data were initially summarized with counts (proportions) and medians (interquartile ranges) and then, using logistic regression, with rate ratios with final model selection based off goodness of fit.

Results: Among the 290 emergency departments studied, only 19% reported offering routine HIV screening; notable differences between emergency departments that do (compared to those that do not) screen for HIV included median visit volumes, teaching hospital status, geographic region, social worker availability, and emergency department director strong worry about costs of preventive health services (all $p<0.05$). However, in multivariable regression modeling only directors' strong worry about costs remained significant (0.13 rate ratio [95% confidence interval 0.03-0.51]).

Conclusion: Overall, among the EDs studied, most do not routinely screen for HIV and strong worry about costs was found to be associated with a reduced rate of screening; both findings are consistent with prior work on the topic and are in spite of national efforts that center on increased HIV screening in ED settings. These findings, in part, may stem from the limited allocation of funds and resources into ED settings required to facilitate more routine screening.

Table: Multivariable Model of Factors Associated with HIV Screening Availability

Characteristic	RR	95% CI	
Teaching Hospital	1.64	0.59	3.38
Located in an EHE HIV Priority Jurisdiction	1.55	0.83	2.58
Social Worker Available in ED 24 hours/day	1.55	0.76	2.73
Crowded by CDC Criteria	1.52	0.89	2.38
Proportion of ED Patients Uninsured ≥35%	1.20	0.45	2.62
ED Director Strongly Worried About Cost	0.13	0.03	0.51

Abbreviations: CDC (Centers for Disease Control and Prevention), ED (emergency department), EHE (Ending the HIV Epidemic),

Legend: As described previously,[3,4] an ED was classified as (1) crowded if it had at least one of three CDC criteria: average waiting time of one hour or greater, left without being seen rate of 3% or more, or any time on ambulance diversion and (2) in an EHE priority jurisdiction if it was located in any of the jurisdictions identified in HHS's "Ending the HIV Epidemic: A Plan for America." Worry about costs corresponds to ED directors' responses on a Likert scale (1-5; strongly disagree-strongly agree) to "I worry that implementing preventive services would lead to increased financial costs to my ED due to lack of reimbursement for added tests, vaccines, and/or counseling." Data missingness was 4.1% and 5.9% for ED directors' worry about costs of implementing preventive health services and information on proportion of their patients who were uninsured, respectively. Missing data were not imputed; only available data were analyzed.

Yes, authors have interests to disclose
Disclosure: Gilead Sciences
Honoraria Gilead Sciences

229 Effect of HIV Screening on Emergency Department Patient Throughput

Joens A, Haukoos J, Hopkins E, Lyons M, Rothman R, Hsieh Y-H, White D, Al-Tayyib A, Gardner E, Sabel A, Rowan S/Denver Health Medical Center, Denver, Colorado, US

Study Objective: To assess the effect of routine human immunodeficiency virus (HIV) screening in the emergency department (ED) on patient throughput.

Methods: The HIV TESTED trial, a multicenter, prospective, pragmatic three-arm randomized clinical trial to evaluate the effectiveness of three distinct opt-out HIV screening approaches in EDs, was nested in a multi-phase interrupted time series quasi-experiment. The trial enrolled at four high-volume, geographically diverse, urban EDs in the United States. Denver used a 5-block interrupted time series while the three other sites (Baltimore, Cincinnati, and Oakland) used a 3-block interrupted time series. Patient throughput outcomes included wait time (defined as sign-in time to in-room time in minutes), length of stay (LOS) (defined as in-room time to ED discharge time in hours), and door-to-door time (defined as sign-in time to discharge time in hours). Standard interrupted time series analyses and multivariable linear regression analyses were performed to estimate associations between HIV screening and outcomes while adjusting for mode of arrival, acuity, and the National ED Overcrowding Scale (NEDOCS) as a composite measure of ED crowding.

Results: A total of 377,392 patient visits were included. For all patient visits, HIV screening was associated with an average increased wait time of 4.7 minutes ($p<0.0001$) in Denver, 12.0 minutes in Cincinnati ($p<0.0001$), and 1.9 minutes in Baltimore ($p=0.01$), while HIV screening was associated with an average decreased wait time of 2.9 minutes in Oakland ($p<0.01$). For non-admitted patients, HIV screening was associated with an average increased LOS of 6.6 minutes ($p<0.0001$) in Denver, while HIV screening was associated with an average decreased length of stay of 3.6 minutes ($p=0.02$) in Oakland; no difference in LOS was observed for Cincinnati ($p=0.23$) or Baltimore ($p=0.09$). Among admitted patients, HIV screening was associated with an average increased LOS of 10.2 minutes ($p=0.0001$) in Denver and 24.0 minutes ($p<0.0001$) in Cincinnati, while associated with an average decreased LOS in Baltimore by 58.8 minutes ($p=0.02$); no difference in LOS was observed in Oakland ($p=0.96$). HIV screening was associated with an average increase in boarding time of 40.2 minutes ($p<0.001$) in Baltimore and an average decrease in boarding time of 4.3 hours ($p<0.0001$) in Cincinnati and 40.8 minutes ($p<0.0001$) in Oakland; no difference in boarding time was observed in Denver ($p=0.07$). Finally, HIV screening was associated with an average increased door-to-door time of 12.0 minutes ($p<.0001$) in Denver while associated with an average decreased door-to-door time of 45.0 minutes ($p<.0001$) in Cincinnati and 12.0 minutes ($p<.0001$) in Oakland; no difference in door-to-door time was observed in Baltimore ($p=0.49$).

Conclusions: Among heterogenous ED populations across four distinct, high-volume urban EDs, wait time, length of stay, and door-to-door time did not appreciably nor consistently change when routine HIV screening was incorporated into standard ED care. Such observed variations likely reflected inherent site-specific variations in ED processes with marginal effect of routine HIV screening.

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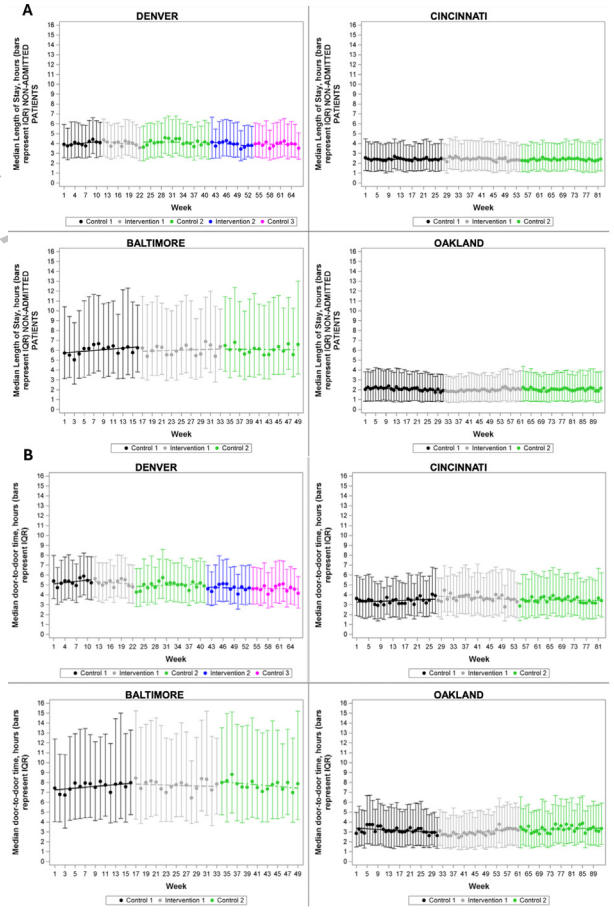

Figure 1. A. Median length of stay among non-admitted patients (hours) and **B.** median door-to-door time (hours), by study site.

Yes, authors have interests to disclose

Disclosure: National Institute of Allergy and Infectious Diseases (NIAID) (R01AI106057), the National Institute on Drug Abuse (R01DA042982), and the Agency for Healthcare Research and Quality (AHRQ) (K02HS017526 and R01HS021749).

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Disclosure: NIAID (R01AI106057), NIDA (R01DA049282), AHRQ (R01HS021749), the Cincinnati Health Network, Hamilton County Public Health, and Gilead Sciences, Inc

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230 Two Years of Screening and Linkage to HIV Preventive Services for At-Risk Adolescents and Young Adults in a Safety-Net Pediatric Emergency Department

Axeen S, Kearl L, Aleman A, Mercado J, Terp S/Keck School of Medicine of the University of Southern California, Los Angeles, California, US

Study Objectives: The pediatric emergency department (ED) at Los Angeles General Medical Center (formerly known as LAC+USC Medical Center), a large, urban public hospital, serves many patients at risk for HIV infection. For many, the ED is the patient's sole point of contact with the healthcare system. Opt-out non-targeted HIV screening among patients 13-21 has been offered in the pediatric ED since May 2022. For patients screening HIV-negative, risk assessments are completed by navigators to determine the need for education and eligibility for linkage to outpatient comprehensive prevention services (CPS). The objective is to describe the demographics and outcomes of program participants over a two-year period.

Methods: Patients between 13-21 years of age were screened during their ER visit. Those who were medically stable, not on an involuntary psychiatric hold, not in the custody of law enforcement, and found to be negative for HIV on screening were eligible for program participation. Included patients were offered education and linkage to CPS if found to report risk factors for HIV infection. Demographics and outcomes of patients screened, offered linkage to CPS, and attended CPS from 5/1/22 to 3/31/24 are described. CPS includes outpatient appointments where patients could be counseled regarding risk mitigation or options for medical prevention services and include primary care, obstetrics and gynecology (OB/GYN), addiction medicine, and other specialty clinics.

Results: Among 1,057 patients ages 13-21 screening negative for HIV, 856 were screened for HIV risk factors, 361 were found to be eligible to be offered CPS, and of these 261 (72.3%) were offered CPS. Among 201 patients screening negative for HIV not screened for risk factors/program eligibility, 94 (46.8%) were on psychiatric holds and 90 (44.8%) were in the custody of law enforcement. Among 361 patients eligible to be offered CPS, 236 (65.4%) identified as female, 124 (34.4%) as male, and one as transgender. Among these, 138 (38.2%) were under 18 years of age, 223 (61.8%) were 18 or greater, 250 (69.3%) were Hispanic, 33 (9.1%) were Black, and 229 (63.4%) were insured by Medicaid. Risk factors identified included: IV drugs use in 8 (2.2%), sexual activity in 286 (79.2%), and other substance use in 145 (56.5%). Women were primarily eligible due to sexual activity (n=204, 86.4%), while men primarily reported drug use (n=58, 46.8%). Among 361 eligible, CPS was offered to 261 (72.3%). Among those 261 for whom CPS was offered, CPS was scheduled for 204 (78.2%) and attended by 198 (75.9%). Of 198 who attended, 147 (74.2%) were female, 144 (72.7%) were Hispanic.

Conclusions: Findings indicate a notable gender gap with female ED patients screened and linked to CPS more often than males, a finding that is likely explained by frequent ED visits for OB/GYN complaints by female patients accepting follow-up with the OB/GYN service. High-risk sexual activity was the overwhelmingly predominant reason that female patients met the criteria for referral to linkage to CPS. This age group would have been in middle and high school during the COVID-19 pandemic. We hypothesize that risky behavior may stem in part from knowledge gaps resulting from limited or absent exposure to sexual education during pandemic-era learning. Individuals in this age range would likely benefit from additional education about HIV transmission and prevention to reduce risky behavior. Notably high rates of attendance at CPS appointments offered indicate enthusiasm by these patients for participation in CPS. To bridge the gender gap identified, venues to engage young men for HIV screening, education, and linkage to CPS must be identified.

Yes, authors have interests to disclose

Disclosure: Gilead Sciences (grant support for screening and linkage program)

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231 The Effects of a "Stroke Code" Protocol on the Utilization of Resources for Patients Who Are Outside of the Thrombolytics Window

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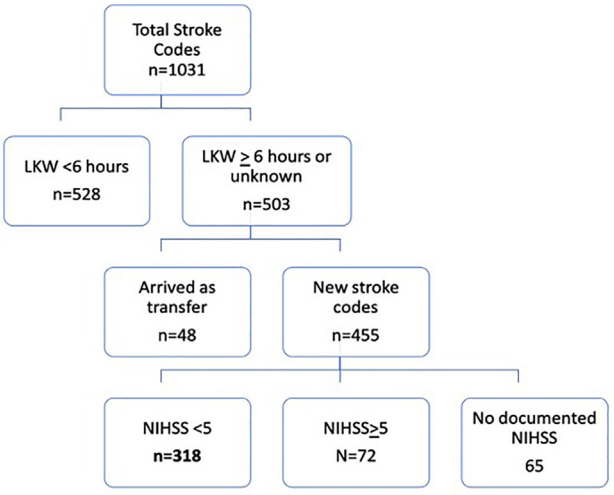
Background: Many emergency departments utilize "stroke code" protocols to rapidly identify patients with strokes, and to treat these patients with systemic thrombolytics and/or mechanical thrombectomy. Patients who have stroke symptoms for <4.5 hours since their last known well (LKW) may be candidates for thrombolytics, whereas patients with large vessel occlusions (LVO) who are outside of the thrombolytic window (LKW >4.5 hours) may still be candidates for mechanical thrombectomy.

Study Objectives: To analyze the use of a "stroke code" protocol with respect to resource utilization and subsequent treatment interventions in patients with National Institutions of Health Stroke Scale (NIHSS) scores <5 with LKW >6 hours.

Methods: A retrospective chart review of 1,031 consecutive "stroke code" patients at an academic tertiary comprehensive stroke center from January 1, 2022 until November 30, 2022 was performed. Data from each individual case was collected, including if the patient received a head cat scan (CTH), a head/neck cat scan angiography (CTA), or head cat scan perfusion (CTP), and if the patient received mechanical thrombectomy from a neurologic interventional radiologist (neuro IR). The collected data was then sorted based on if the patient's LKW was less than or greater than/equal to 6 hours. A cutoff for the LKW of >6 hours was used instead of >4.5 hours based on institutional cutoffs with respect to "stoke code" activations for resolved neurologic symptoms.

Results: Of the 1,031 stroke code activations, 503 patients had LKW>6 hours or unknown (Flow chart). Out of these 503 patients, 48 had already received imaging from an outside hospital and were transferred to the tertiary hospital for evaluation by neuro IR. Of the remaining 455 new "stroke code" patients, 72 had a NIHSS greater than/equal to 5, and 65 did not have a NIHSS documented. Out of the 318 remaining patients with a NIHSS<5, there were 193 CTP's, 210 CTAs, and 307 CTHs performed, which corresponds to 18.7% (CTP), 20.4% (CTA), and 29.8% (CTH) of the total 1031 total stroke codes. Out of the 455 new "stroke code" patients with LKW>6 hours, 5 were taken for acute interventions by neuro IR, none of which were from the NIHSS<5 group. Their individual NIHSS scores were 5, 7, 9, 11, and 20.

Conclusion: Patients with a LKW >6 hours and who did not have significant neurologic deficits, as identified by their low NIHSS scores, were unlikely to get any acute stroke intervention. Since there was no stroke interventions in any of the cases that had no documented NIHSS, the overutilization of the "stroke code" protocol is likely even further underestimated. The use of a "stroke code" activation system that requires protocolized testing, and an immediate response by multiple team members, may lead to an overutilization of resources and the subsequent costs associated with unnecessary testing in these patients, while not providing a significant benefit.



No, authors do not have interests to disclose

232 A Multimodal Quality Improvement Intervention to Reduce Head and Cervical Spine Trauma Imaging

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Study Objectives: Blunt head and spine trauma account for a significant portion of emergency department (ED) visits, with a consistent increase in computed tomography (CT) scans over recent decades. Despite the growing use of CT in the ED, there has not been a concomitant increase in the prevalence of life-threatening conditions or hospital admissions. With established evidence-based clinical decision rules, CT imaging of the head and cervical spine (c-spine) for trauma are ideal targets for quality improvement projects to reduce CT use. Limited literature in adult populations exists on this topic. This study aims to examine the effect of multimodal quality improvement campaign on head and c-spine CT imaging for trauma in the ED. The primary objective was to assess the impact of the campaign on head and c-spine CT imaging use, with a secondary focus on reducing variability among clinicians.

Methods: A prospective observational study was conducted in an urban academic level-1 trauma center ED with about 56,000 annual encounters and a community level-3 trauma center ED with about 40,000 annual encounters over a period of 27 months. The study comprised a 6-month pre-intervention baseline and a continuous 21-month interventional period. Elements of the quality improvement campaign included individual CT ordering data feedback, provider surveys, educational presentations, patient handouts, and electronic order entry clinical decision support. Periodically throughout the campaign, head and c-spine CT data was analyzed as a primary outcome at both ED sites. Individual clinician CT data was grouped and analyzed in funnel plots as a secondary outcome to determine how provider ordering heterogeneity was affected by the intervention. Variability in provider ordering was determined by analysis of the number of outlier physicians who ordered above the upper control limits (3 sigma) of average head and c-spine CT ordering within our department. Total, non-exclusive CT use at both sites was also analyzed to provide context for the primary and secondary outcomes trends.

Results: Following the intervention, at the academic ED, there was a statistically significant ($p<0.05$) decrease in average c-spine CTs per 100 patients from 3.08 to 2.57. Head CT use per 100 patients at the academic ED also trended down, but would require two more sustained months to demonstrate a significant reduction. Overall CT scans per 100 patients at the academic ED also decreased at a statistically significant level ($p<0.05$) from 55 to 47 CT scans per 100 patients. At the community ED, there were sustained statistically significant ($p<0.05$) reductions in head CTs from 6.64 to 5.12 per 100 patients and c-spine CTs from 4.31 to 3.49 per 100 patients. There was a trend in overall increasing CT use at the community ED over time, with unclear significance of this trend in the context of other improving trends. Overall provider ordering variability following the intervention at both sites also decreased, with fewer outlier physicians in both head CT use from 6 to 2 and in c-spine CT use from 7 to 2.

Conclusion: This study demonstrates the effectiveness of a multimodal quality improvement campaign to reduce head and c-spine CT imaging for trauma in the ED. The campaign included regular individual clinician feedback, education in evidence-based practice, and clinical decision support tools. Reductions in head and c-spine CT usage were observed at both academic and community EDs, with an additional decrease in interprovider variability. Similar interventions hold promise for improving healthcare quality, increasing efficiency, and reducing unnecessary radiation exposure and costs.

Yes, authors have interests to disclose
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233 Medical Jargon Is Often Misunderstood by Emergency Department Patients

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Study Objectives: Even though medical jargon should be avoided, jargon is frequently used by healthcare providers when discussing results or treatment plans with emergency department (ED) patients. We sought to determine if commonly used medical jargon is understood by patients during discharge from the ED.

Methods: This is a cross-sectional survey of English-speaking adult patients in an urban public ED (annual volume 130,000) during discharge with enrollment period 10/04/23 to 4/4/24. An 11-item closed-end survey adapted from a previously validated medical jargon instrument was adapted for the ED by experts in communication and safety. Jargon words were incorporated into discharge phrases that have common meanings in regular usage but different meanings in medicine. Participant demographics, discharge communication preferences, and education level were also assessed. The instrument was piloted, revised, and administered in-person by trained research assistants. Descriptive analyses were used where appropriate.

Results: One hundred and eleven participants completed the survey (N=111): mean age 47 years (range 18-81), 52% were female, 64% black, 8% white, 6% Asian, 20% other; 27% were Hispanic. Highest level of education completed: 42% had high school diploma or GED, 35% completed some higher education, and 23% did not complete high school. Only 9% of participants correctly understood "impressive", 22% understood "acute", 38% understood "benign", and 41% understood "unremarkable"; "fracture" and "negative" were understood most by 67% and 68%, respectively. The range of "I don't know" was as low as 5% and as high as 34% depending on the jargon question. In addition to verbal instructions, printed discharge instructions were preferred by 71%; only 18% preferred discharge instructions from the electronic health portal. Only 54% have a current primary care provider (PCP), 68% had some form of insurance. Correct responses were not associated with education or having a PCP (p=NS).

Conclusion: Commonly used medical jargon in the ED is poorly understood by patients. This can lead to safety issues including misunderstandings, errors, and non-adherence to discharge plans. To enhance safety and adherence to discharge instructions, future interventions are needed to improve our communication with all patients.

No, authors do not have interests to disclose

234 Quality Improvement Project to Improve Electronic Transfer of Outside Hospital Records at a Veterans Affairs Hospital

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Study Objectives: With the regionalization of specialized care and consolidation of rural hospitals, safe and efficient interhospital transfers are of paramount importance. In one study, 58% of providers felt complete documentation is key to effective interhospital transfers. Yet, the transfer best-practices carried out the least frequently are those of patient documentation and interfacility communication, particularly regarding availability of documentation in the electronic health record (EHR). Considering that up to 2500 patients are transferred to each tertiary care center per month—and that these patients are at risk for higher mortality, longer hospital stays, and higher costs—the lack of availability of patient documentation in the EHR can pose a serious risk in the safety of transferred patients. Within the Veterans Affairs (VA), the VA Office of Inspector General in 2019 found there were significant medical documentation backlogs, with at least "5 miles" of records for nearly 600,000 Veterans not scanned into VA record systems. At the Nashville VA (TVHS), there are approximately 5 transfers per week directly admitted to hospital floors. However, there is no standardized process for urgently uploading the patient's associated transfer documentation. We seek to evaluate how establishing a standardized process affects the timeliness and availability of Veteran hospital records from outside hospitals.

Methods: This was a quality improvement project using a Plan-Do-Study-Act (PDSA) design, conducted at a single, urban, community, level 1 complexity VA in Nashville, TN. Prior to intervention, medical records were provided by paper by the transferring ambulance service. Records were kept with the patient and then sent for electronic scanning at a time based on the clinical team's discretion. Following contextual inquiry to understand the flow of records, we conducted education with the medical residents most likely to receive the paper records about the importance of scanning medical records. We also implemented a standardized process to receive and upload transfer records to the document imaging system. Interhospital transfers were tracked from January 2024 to April 2024 as part of a larger study on interhospital transfers. Transfers were included if they were for Veterans originating from a non-VA ED and were intended as admissions directly to a hospital floor. Patients transferred from an assisted living facility, another VA, or as a direct admission from clinic were excluded. The primary outcome was the time to availability of scanned records within a maximum of 30 days. All information was collected by chart review of the TVHS VISTA document imaging system.

Results: Between 1/16/24-4/22/24, there were 54 interhospital transfers that met eligibility. Among these, 20 (37%) had outside hospital records uploaded. The standardized protocol was implemented on 4/1/24. Before implementation, the mean time until document availability was 23 days. Since implementation, 12 Veterans were transferred to the VA, with four having records uploaded to the EHR, with an improved mean duration to upload of 3 days. Further data collection is ongoing and will be used to assess the effectiveness and durability of the process.

Conclusion: Lack of communication between hospitals via hospital medical records is a barrier to high quality care transitions. Education and the use of a standardized protocol have reduced the delay in electronic document availability. Further data are necessary to evaluate its success in improving the number of records available, as well as the sustainability of this program.

No, authors do not have interests to disclose

235 Failed Initiatives to Reduce Violence and Aggression Against Emergency Department Staff

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Study Objectives: Violence and Aggression (V/A) against emergency department (ED) staff continue to deteriorate in the UK despite local and national initiatives. Common triggers include patients, relatives, friends, employee, and crowded ED environment. A 2023 Audit of ED staff views from a north Kent hospital, United Kingdom, revealed multiple organisational failings to address V/A such as Incident Reports tampering, no personal alarms, no staff support for court or police cases, limited hospital security, limited support from senior staff, and discouraging staff from reporting or discussing incidents. A task group was created to address Audit findings. V/A initiatives include body-cameras for senior nurses, improve police response, recruiting additional and improving hospital security response, improve Incident Report assessments and action plans, ED V/A leadership role expansion, improve management of the Red and Yellow Card deterrent system, and investigation into the tampering of Incident Reports were implemented. This re-audit is to evaluate ED staff views since the 2023 V/A initiatives.

Methods: Pre- and post-audits were approved using the same questionnaire. Staff were handed questionnaires individually or in groups and were collected by the researcher on completion. The 2024 questionnaire include staff response to the 2023 V/A initiatives. Questionnaire clarifications were provided but staff not encouraged to complete sections if uncomfortable.

Results: 106 (2024) and 97 (2023) questionnaires met inclusion criteria. Age distribution and years of service for both groups were similar. 26% of staff participated in both audits. 83% (2024) vs 88% (2023) witnessed V/A with 52% (2024) vs 73% (2023) were victims. The ED Minors and Triage Assessment Areas accounted for the highest and worsening areas for V/A. An increasing number were reported from the Paediatric area and the new clinical area, ED Corridors, that was created to address hospital flow. Verbal Abuse was 54% (2024) vs. 60% (2023) with Racial and Physical Abuse exchanging second and third positions. Staffs recorded ongoing abuse even when patients and relatives were moved to other areas of department. Some staff were instructed to continue caring for their abusers. Staff report multiple abuses such as Verbal, Racial, Sexual, Homophobic, Death threats, Objects thrown at them, or

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Physical attacks. Physical abuses were more violent with dental, soft tissue, and bony injuries, resulting in staff off sick. Groping of female staff and patient on patient violence are new trends. Verbal reports to senior staffs, 35% (2024) vs. 36% (2023), Incident reports 24% (2024) vs. 27% (2023), contacting Security and the Police were the commonest methods for reporting incidents and seeking support. There were minimal improvements in hospital security, 27% (2024) vs. 26% (2023) and police 12% (2024) vs. 9% (2023). Initiatives showed improvements, but staff felt conditions worsened after the V/A lead was replaced. 53% of staff were unaware of the 2023 V/A Initiatives and 67% reported worsening ED environment. Investigation into Incident Report tampering not undertaken.

Conclusion: Audit demonstrate failed Organisational and Duty of Care to manage V/A. Replacing the department's V/A representative, the lack of accountability and leadership in ED and at corporate levels contributed to an austere ED environment.

No, authors do not have interests to disclose

236 Optimization of Low-Flow Time in Extracorporeal Cardiopulmonary Resuscitation for Out-of-Hospital Cardiac Arrest: A Decade-Long Analysis

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Study Objective: Extracorporeal cardiopulmonary resuscitation (ECPR) significantly improved outcomes in refractory out-of-hospital cardiac arrest (OHCA), particularly in patients with shockable rhythms. Historically, ECPR was initiated post-emergency room (ER) arrival, but recent research advocates shifting toward prehospital initiation. This could shorten the low-flow times and potentially improve survival and neurological outcomes. Our study evaluates the impact of this shift through a decade-long analysis, comparing periods before and after the implementation of prehospital ECPR protocols at a tertiary medical center.

Methods: This retrospective cohort study analyzed 182 patients who underwent ECPR at our ER from 2015 to 2024. Exclusion criteria included incomplete records and cases who received ECMO due to cardiogenic shock. There were three phases of protocol optimization: Phase 1 (2015/01-2019/12), where ECPR activation required a cardiovascular surgeon's consult after patients arrived at the ER; Phase 2, ER protocol (2020/01-2023/03), where ECPR could be initiated directly by ER physicians right after patient arrival according to an in-hospital ECPR protocol; Phase 3, EMS protocol (2023/04-2024/01), where ECPR could be initiated by the emergency medical system before patient arrival according to a pre-hospital ECPR protocol. We collected information including characteristic features (sex, age, bystander CPR, initial rhythm), the time of EMS initiation, ER arrival, ECMO team notification, and ECMO activation. The duration from EMS initiation to ECMO activation represents the low-flow time. Primary outcomes were low-flow time (from patient collapse to ECMO initiation) and ECMO team activation time. Secondary outcomes included survival rates and favorable neurological outcomes at discharge. Data were analyzed using ANOVA or Kruskal-Wallis tests based on distribution, and Chi-square tests for categorical data, supplementary with multivariate regression.

Result: We analyzed 25, 53, and 14 cases from Phase 1, Phase 2, and Phase 3, respectively. The characteristic features and prehospital times showed no significant difference. The median low-flow times (minutes) for each phase were 64.0 (54.0 - 78.0), 62.0 (53.0 - 69.0), and 48.5 (43.8 - 56.2). The median ECMO team activation times were 37.0 (25.0 - 50.0), 31.0 (24.0 - 39.0), and 20.5 (16.2 - 22.8). Both primary outcomes showed statistically significant differences across the three phases with p- values of 0.01 and 0.001, respectively. Post-hoc evaluation revealed a significant decrease in times when comparing Phase 3 to Phase 2 and Phase 1. Multivariable regression revealed that ER protocol and EMS protocol significantly decreased the low-flow time, 14 minutes and 25 minutes respectively. The survival rates and favorable neurological outcomes showed no significant difference across the phases.

Conclusion: While both the in-hospital and pre-hospital ECPR protocols effectively optimized low-flow time for out-of-hospital cardiac arrest patients, the pre-hospital ECPR protocol was significantly more beneficial.

Table 1: Demographic analysis

	Phase 1(n=25)	Phase 2(n=53)	Phase 3 (n=14)	P-value
Age	50.0 (41.0 - 59.0)	57.0 (43.0 - 63.0)	54.0 (46.5 - 61.8)	0.756
Sex (Male)	84%	83%	92.9%	0.588
Initial Rhythm (Shockable)	84%	66%	78.6%	0.35
Bystander CPR	64%	66%	78.6%	0.169
Response Time (min)	4.0 (4.0 - 6.0)	5.0 (4.0 - 7.0)	6.5 (5.0 - 7.0)	0.377
Scene Time (min)	14.0 (11.0 - 15.0)	15.0 (10.0 - 21.0)	16.5 (12.8 - 21.5)	0.129
Prehospital Time (min)	27.0 (23.0 - 30.0)	29.0 (23.0 - 34.0)	27.0 (24.8 - 30.0)	0.465
Collapse to ECMO initiation (min)	64.0 (54.0 - 78.0)	62.0 (53.0 - 69.0)	48.5 (43.8 - 56.2)	0.0106
ED arrival to ECMO initiation (min)	37.0 (25.0 - 50.0)	31.0 (24.0 - 39.0)	20.5 (16.2 - 22.8)	0.0011
ED arrival to ECMO team notification (min)	16.0 (5.0 - 23.0)	8.0 (3.0 - 14.0)	0.5 (-2.8 - 6.8)	0.0014
Survival (%)	48%	32%	35%	0.395
Favorabel neurological outcome(%)	28%	12%	28%	0.119

Table 2: Univariable analysis of low-flow time

	Constant (Intercept)	Coefficient	Adjusted R-suqared	P-value
Age	58.742	0.0083	0.002	0.667
Sex	63.929	-1.018	0	0.883
Shockable Ryhthm	72.880	-13.477	0.0065	0.014
Bystander CPR	71.433	-12.417	0.062	0.017
Year	84.4384	3.1003	0.064	0.009
Consult base	69.7213		0.139	
ED Protocol		−14.7689		0.007
EMS Protocol		−25.8324		0.001

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Table 3: Multivariable analysis of low-flow time

	Coefficient	P-value
Sex	0.82	0.888
Age	0.033	0.841
Shockable Ryhthm	-8.59	0.092
Bystander CPR	-5.90	0.219
Year	-1.67	0.207
Protocol	-7.95	0.035

Constant: 94.081

R-squared: 0.236

Adjuested R-squared: 0.185

F-statistic P-value, < 0.001

F-statistic's p-value: < 0.001

Figure 1: Distribution of activation
(ER protocol, ECPR could be initiated directly by ER physicians right after patient arrival according to an in-hospital ECPR protocol; EMS protocol, where ECPR could be initiated by the emergency medical system before patient arrival according to a pre-hospital ECPR protocol)

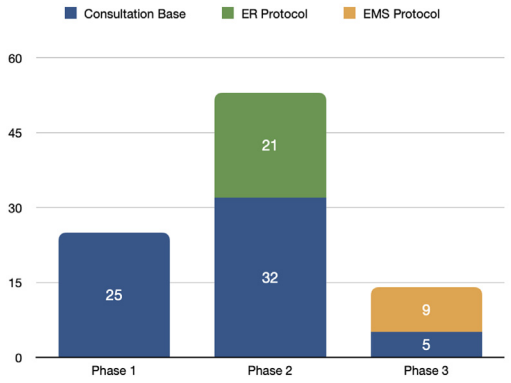
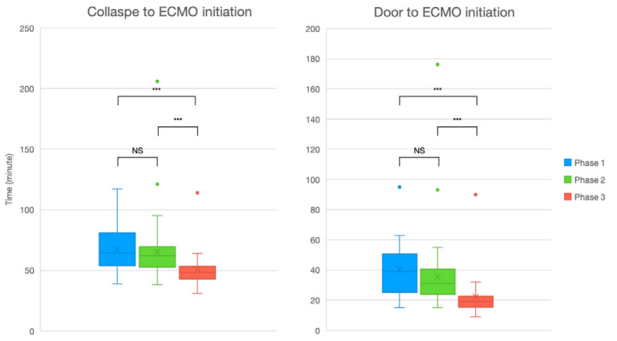


Figure 2: Collapse to ECMO initiation time (Low-Flow Time) and Door to ECMO initiation time
(NS, non-significant; ***, significant)



No, authors do not have interests to disclose

237 Study of Peri-Resuscitation Troponin and Outcomes (SANTO) Proof of Concept

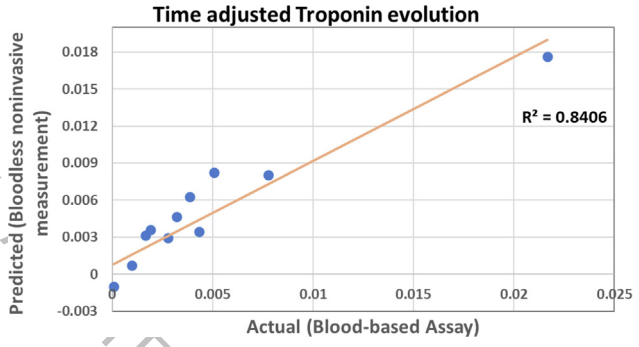
Nichol G, Mullan B, Okerman B, Morse D, Adams K, Morse S, Schmicker R, Burman A, Katz J, Titus J/University of Washington-Harborview Center for Prehospital Emergency Care, Seattle, Washington, US

Background: Common causes of out-of-hospital cardiac arrest (OHCA) include a) arrhythmia, b) chronically weak myocardium, or c) acute occlusion of a coronary artery. Effective therapy must be started quickly. Strategies to improve systemic perfusion include mechanical circulatory support or extracorporeal membrane oxygenation (ECMO) until percutaneous coronary intervention (PCI) can be done to correct coronary occlusion. Use of ECMO requires specialized personnel, is resource intensive, and does not benefit all patients. As well, in patients with restored circulation, early PCI may improve outcomes. A rapid and accurate method is needed to identify patients with high likelihood of acute coronary occlusion. RCE Technologies Inc., Carlsbad, CA is developing an Infrasensor for bloodless transdermal assessment of cardiac injury. This uses transdermal infrared measurement of cardiac troponin I. We sought to assess the feasibility of its use in the emergency department (ED).

Methods: This prospective cohort study enrolled adults resuscitated from OHCA of presumed cardiac etiology, with spontaneous circulation at ED arrival. The device is applied as soon as feasible after patient arrival and as close as possible to a troponin blood draw. A second blood draw is sought to observe trends. The primary outcome was feasibility: proportion of patients with device applied and troponin value recorded. Bloodless troponin values were correlated with standard blood-based measures.

Results: 28 participants were enrolled as of April 25, 2024. Median age was 65 years; 50% female; 43% had witnessed arrest; 39% had bystander cardiopulmonary resuscitation; and 39% had shockable first rhythm. Infrasensor values were available on 15 (58%) participants; 13 had two serum troponin values and were included in the analysis (Figure).

Conclusions: Measurement of bloodless troponin values is feasible after OHCA. Bloodless troponin values are highly correlated with serum troponin values. Additional research is required to determine if Infrasensor in the ED or field improves patient outcomes.



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238 Success of Echocardiography Locations for Cardiac Image Acquisition in Cardiac Arrest

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Background: Point-of-care ultrasound (POCUS) is an invaluable tool in the management of patients in cardiac arrest. However, there is a growing concern that performing POCUS can lead to increased interruptions in chest compressions and prolonged pulse check duration. The subxiphoid view is often the traditional cardiac window to visualize the heart during cardiac arrest; however, this may be challenging due to body habitus and stomach distention. Currently, there is no consensus regarding the ideal first location to obtain transthoracic echocardiography (TTE) images. Determining which TTE view has the greatest ease of image acquisition could reduce duration of chest compression interruptions. The primary objective of this study was to determine which TTE window, subxiphoid, parasternal or apical, is associated with the highest success rate of cardiac visualization during a pulse check in patients in cardiac arrest. We also sought to determine whether various TTE locations were associated with increased chest compression interruption times. And whether there were higher rates of success among credentialed versus non-credentialed sonographers.

Methods: This is a retrospective cohort study of video recorded non-traumatic, adult cardiac arrest patients in a quaternary care emergency department (ED) from November 2018 to November 2023. All cardiac arrest resuscitations in the critical care area are recorded and reviewed by trained study faculty members. During review, faculty recorded the duration of chest compression interruptions, the location of cardiac ultrasound placement (parasternal, subxiphoid, or apical), the success rate of cardiac visualization, and the level of ultrasound training of the sonographer. Cardiac ultrasound images obtained during pulse checks were recorded and later reviewed. Descriptive statistics were used to describe study outcomes.

Results: 296 cardiac arrest patients were analyzed and 379 TTEs performed. The following TTE views were attempted: 251 (66.2%) subxiphoid, 105 (27.7%) parasternal, and 23 (6.1%) apical. The success rate of TTE was 83.4% for subxiphoid, 88.1% for parasternal, and 95.7% for apical. The median chest compression interruption time was 15.0 seconds for subxiphoid, 16.5 seconds for parasternal, and 19.0 seconds for apical. The overall success in acquiring a cardiac image by credentialed providers was determined to be 93.1%, compared to 71.7% for non-credentialed providers.

Conclusions: When performing TTE in cardiac arrest patients in the ED, the parasternal and apical locations have similar success of cardiac visualization and interruption times to the more commonly used sub-xiphoid location. Although the subxiphoid view is often the primary view obtained, providers should be mindful of using other views depending on the individual patient. Additionally, our study shows that credentialed sonographers have improved success rates of cardiac visualization, suggesting that the most experienced sonographer should be performing the TTE. Further studies are needed to link the success in acquiring a TTE image using at the various locations to clinical outcome. Further studies are needed to assess the link between successful acquisition of a TTE image at various locations and clinical outcomes.

No, authors do not have interests to disclose

239 Association Between the Area of Maximal Compression Determined With Intra-Arrest TEE and End-Tidal CO_2 in Cardiac Arrest: A Resuscitative Transesophageal Echocardiography Collaborative Registry (rTEECoRe) Study

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Study Objectives: Transesophageal echocardiography (TEE) allows the real-time evaluation of the area of maximal compression (AMC) during cardiopulmonary resuscitation (CPR). Previous work has shown that compression of the left-ventricular outflow tract (LVOT) or the aortic root during CPR (AMC-LVOT/Ao) occurs between 30-50% of patients, and this finding has been associated with lower probability of return of spontaneous circulation (ROSC). While the location of the AMC has been identified as a potential factor causing ineffective CPR, the hemodynamic impact has not been clinically demonstrated. End-tidal carbon dioxide ($ETCO_2$) is a well-established parameter of CPR quality and represents the best available non-invasive surrogate of myocardial blood flow during CPR. In this study we aimed to evaluate the association between AMC and $ETCO_2$ as a physiologic outcome during cardiac arrest resuscitation. We hypothesized that patients with AMC over the LV (AMC-LV) have higher $ETCO_2$ compared to AMC-LVOT/Ao.

Study Design/Methods: Interim analysis of a prospective, observational, multicenter cohort study involving patients with out-of-hospital and in-hospital cardiac arrest (OHCA; IHCA) in whom TEE was performed during CPR, conducted through the Resuscitative Transesophageal Echocardiography Collaborative Registry (rTEECoRe), a collaborative research network involving 23 centers (NCT04972526). Patients were enrolled between January 2021 and April 2024. Data was collected on clinical and TEE characteristics and findings. Inclusion criteria for this analysis was TEE performed intra-arrest during OHCA or IHCA, with $ETCO_2$ measurement at the time of AMC evaluation. The primary physiologic outcome was $ETCO_2$ at the time of AMC assessment by TEE and our primary independent variable was AMC-LV. We performed a univariate analysis followed by a multivariate regression model. Fixed covariates included demographics, as well as several factors known to impact resuscitation outcomes including initial rhythm of arrest, doses of epinephrine, type of CPR bystander CPR, and downtime.

Results: Out of the 59 patients included in this analysis 45 (76%) were OHCA and 14 (24%) IHCA. Median age was 63 (50, 73) years, 30% were female, 70% had witnessed arrest, 64% had bystander CPR, and 44% had mechanical CPR. In this cohort 32% had AMC-LV, and 30% had AMC-LVOT/Ao, 3% had AMC another location, and in 35% the AMC was undetermined. In the multivariate regression model controlling for age, race, gender, initial rhythm of arrest, type of CPR, doses of epinephrine, and downtime, AMC-LV was associated with significantly higher $ETCO_2$ compared to AMC-LVOT/Ao (Beta -14 95% CI -26, -2.7) and all other locations.

Conclusion: This preliminary analysis of patients with OHCA and IHCA evaluated with TEE shows that the intra-arrest finding of the AMC-LV is associated with higher $ETCO_2$. These data are consistent with prior animal data showing the hemodynamic impact of TEE-guided CPR and prior clinical data demonstrating the association between AMC and ROSC.

Yes, authors have interests to disclose

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Disclosure: Co-Chair Scientific Oversight Committee The Resuscitative TEE Collaborative Registry Investigators

Scientific Study/Trial

Co-Chair Scientific Oversight Committee The Resuscitative TEE Collaborative Registry Investigators

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Other

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EMF

240 Exploring Early Intramuscular Epinephrine for Enhanced Drug Exposure and Early Hemodynamic Support in Cardiac Arrest: A Pilot Study in a Porcine Model

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Study Objective: Early administration of epinephrine during cardiac arrest is associated with improved outcomes. Intramuscular (IM) epinephrine is a potentially faster drug delivery method compared to standard care [intravenous (IV) epinephrine]. However, the pharmacokinetics (PK) and pharmacodynamics (PD) of IM epinephrine in this context remain unclear. Therefore, this study aimed to compare the PK/PD profile of early IM epinephrine compared to standard care in a porcine model of cardiac arrest.

Methods: This was a prospective, randomized, double-blind preclinical study. We induced ventricular fibrillation cardiac arrest in a porcine model. Following 12 minutes of cardiac arrest, animals (n=18) were randomized to treatment with either early IM epinephrine (0.1 mg/kg) or standard care (0.1 ml/kg normal saline IM followed by delayed IV epinephrine 0.01 mg/kg). Both groups received standard dose IV epinephrine (0.01 mg/kg) every 4 minutes starting at 21.5 minutes post- cardiac arrest. We measured serial plasma epinephrine concentrations and hemodynamic parameters for 60 minutes. We determined the time to peak plasma epinephrine level (Tmax), peak plasma epinephrine concentration (Cmax), area under the curve (AUC), and mean arterial pressure (MAP).

Results: The experiment included 9 animals in the standard care IV epinephrine group and 9 animals in the early IM epinephrine group. The two groups had similar hemodynamic parameters at baseline (mean MAP 74.9 +/- 11.4 mmHg in the standard care group vs. 73.8 +/- 11.9 mmHg in the IM epinephrine group; p=0.813). Early IM epinephrine resulted in a significantly higher area under the curve (AUC) compared to standard care (total peak area 4433 +/- 1528 pg*min/ml vs. 1568 +/- 474.8 pg*min/ml, p=0.027), indicating greater overall drug exposure. While Cmax and Tmax did not differ significantly between groups (mean Cmax 152.7 +/- 108.6 pg/ml in the standard care group as opposed to Cmax 218.8 +/- 119.6 pg/ml in the IM epinephrine group, p=0.312; Tmax 3.5 +/- 0.93 minutes in the standard care group vs. 3.1 +/- 1.6 minutes in the IM epinephrine, p=0.559), mean arterial pressure (MAP) was significantly higher at 7 minutes post-IM injection in the IM group (mean MAP 38.4 +/- 12.1 vs. 26.1 +/- 9.2 mmHg, p=0.028).

Conclusion: These findings suggest early IM epinephrine may offer a more sustained increase in plasma epinephrine concentration and improve early hemodynamics compared to delayed IV administration during cardiac arrest. Further studies are warranted to explore the impact of different dosing regimens on PK/PD and hemodynamic profiles.

Yes, authors have interests to disclose

Disclosure: Certus Critical Care, Inc.

Consultant/Advisor Certus Critical Care, Inc.

Disclosure: Certus Critical Care, Inc.

Consultant/Advisor Certus Critical Care, Inc.

Disclosure: CoLabs, Inc.

Consultant/Advisor CoLabs, Inc.

241 Proof-of-Principle: CRISPR-Based Rapid, Amplification-Free Bacterial RNA Detection for POC Bacteremia Detection

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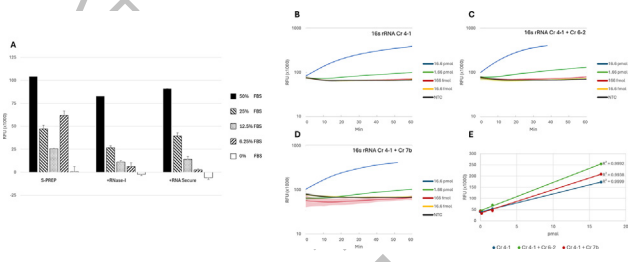
Background: Sepsis is one of the leading causes of hospital deaths in the US, costing 62 billion USD annually. While significant advancement has been made in treating sepsis, accurately diagnosing bacterial sepsis remains challenging. Currently, no diagnostic tools exist that directly detect bacterial pathogen within 1-3 hours, leading to liberal antibiotics use in the emergency department. CRISPR has emerged as a potential alternative to direct identification of human disease-relevant pathogens. For example, SHERLOCK (Specific High Sensitivity Enzymatic Reporter UnLOCKing) has gained FDA's Emergency Use Authorization for COVID diagnosis. In this proof-of-principle study, we examine the fundamental utility of CRISPR for rapid bacterial detection, with an eye towards development of a bed-side point-of-care (POC) diagnostic tool usable in a resource-limited environment.

Methods: CRISPR activity against bacteria in various concentrations of fetal bovine serum (FSB) was tested and optimized in a open plate-reader format. Modified S-PREP (SHERLOCK parasite rapid extraction protocol), a 15-minute crude sample preparation, was used to quench non-specific RNase activity. Several guide RNAs were designed against the E coli 16s rRNA, and *in-vitro* activity confirmed. Activity was then tested in human serum, blood, and urine with spiked rRNA.

Results: Modified S-PREP efficiently quenched the false positive signal from the FBS (Fig A, N = 2, error bar = SD). We demonstrate that this is compatible with direct bacterial rRNA detection down to a low picomolar range (Fig B, N = 3, band = 95% CI) with modest improvement when two separate areas of rRNA was targeted in a single reaction (Fig C-E, N = 3, band = 95% CI). The detection step took less than 20 minutes for a total assay time less than 45 minutes.

Conclusion: Our data show promising preliminary results for a rapid, amplification-free diagnostic test for bacterial rRNA in simulated clinical samples. Including the sample preparation time, our total assay time fits well within the Surviving Sepsis Campaign guidelines. The main limitations of our study include our *in-vitro* assay design using spiked rRNA, and somewhat high limit-of-detection (LOD). While there is no clear consensus regarding the rRNA load that corresponds to clinical presentation of sepsis, based on the prior ddPCR-based work, we estimate that low femtomolar range LOD may be needed to attain a clinically meaningful sensitivity. Given that only a handful of 16s rRNA targets were tested in this proof-of-principle work, we anticipate that this level of LOD is achievable with expanded target selection.



No, authors do not have interests to disclose

242 Machine Learning Model to Predict Emergency Department Patients Who Left Without Being Seen

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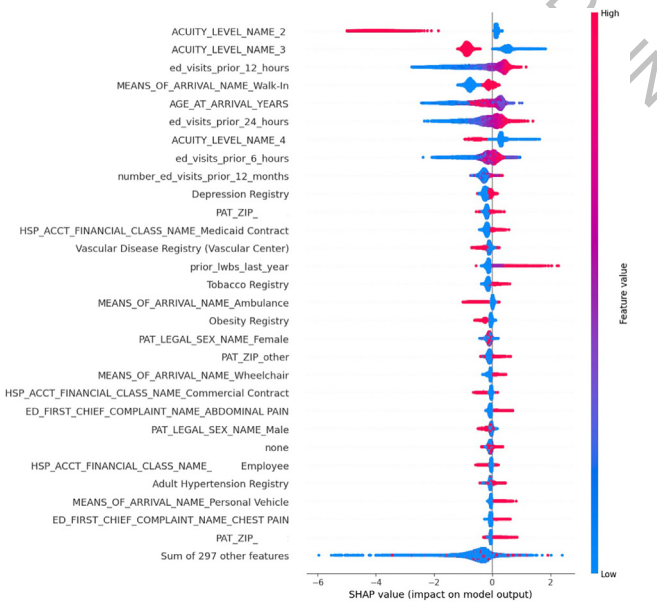
Study Objectives: Left Without Being Seen (LWBS), a Centers of Medicare and Medicaid (CMS) quality measure, is associated with adverse patient outcomes. Patients who LWBS are more likely to have their condition worsen than patients who received a complete assessment and treatment. In the years following the pandemic, the rates of LWBS increased significantly across the United States prompting hospitals to look for new strategies to prevent patients from LWBS. Our objective is to develop a machine learning (ML) model that will help identify patients at risk of LWBS.

Methods: We included all emergency department (ED) visits at our large academic institution from 01/01/2022 to 12/31/2023. We created an ML model that used 80%

of the dataset for training and 20% for testing. Patient variables include age, race, ethnicity, sex, emergency severity index, means of arrival, chief complaint, financial class, zip code, and chronic disease registry enrollment, LWBS episodes in prior 12 months, and ED visits in prior 7 days and prior 12 months. ED characteristics included the number of ED registrations in the prior 6 hours, 12 hours, and 24 and hours. Synthetic Minority Over-Sampling (SMOTE) was applied to oversample the minority class and new synthetic examples were created based on space similarity to match the majority class frequency. A Standard Scaler was applied. Five classification models were trained (logistic regression, k-nearest neighbors, random forest, eXtreme Gradient Boosting (XGBoost), and a Deep Neural Network) and performance metrics were calculated on the predictions on the test set from the fit model. The XGBoost classifier was selected for best performance. Mean SHapley Additive exPlanations (SHAP) values were calculated for each feature to understand the contribution of the encoded features on the model output (Figure).

Results: A total of 161,933 unique ED visits were included in the analysis. LWBS rate was 3.54% which is similar to the national average for the large EDs. The following patient factors were associated with higher chances of LWBS: lower acuity ESI, younger age, female sex, black or African American, Hispanic, walk in (vs. arrival by ambulance), Medicaid, certain zip codes, high prior LWBS, high prior visits in prior 7 days and 1 year. Depression, tobacco and hypertension registry increase the risk of LWBS while obesity registry decreases it. The higher number of prior ED visits at the time of presentation in the prior 6, 12, and 24 hours were all associated with increase in chances to LWBS. ML accuracy was 96% and the area under the curve (AUC) was 85%. After oversampling for class, the unbalanced model's precision was 57%.

Conclusion: In this study, we built an ML model that can identify some patients at risk of LWBS. It opens an option to intervene on the patients that were marked by the model as high risk for LWBS. Such interventions could include prioritized reassessment, better symptom management, and targeted communication about the wait if a room is not readily available. Variables linked to LWBS identified as part of this project are in line with prior literature.



No, authors do not have interests to disclose

243 Longitudinal Impact of an Emergency Medicine Summer Fellowship for Under-Represented Medical Students

Garcia L, Hohenstein N, Jaradeh K, Kaki D, Rodriguez N, Anaya N, Graterol J, Chen C/University of California, San Francisco, San Francisco, California, US

Study Objectives: Since 2001, the American College of Emergency Physicians (ACEP) policy goals have included diversifying the emergency medicine (EM) workforce. Despite improvements, many groups remain under-represented in medicine (URM). For example, Black physicians made up 6% of all active EM residents in 2023, compared to 14% of the US population in the 2020 census. Pathway programs have proven to be a successful means of supporting URM students' entry into various specialties. Thus, in 2021, we developed a URM EM summer fellowship for medical students (MS) to explore EM and to create lasting support systems for pursuing EM residency. The objectives of the fellowship are to facilitate: 1) EM clinical skills and exposure to aid in future clerkships, 2) research opportunities within EM, 3) mentorship by URM faculty and residents, and 4) community building for URM fellows (URMF).

Methods: The program consists of 6 weeks of programming for rising second-year MS. To address objectives 1 through 4, the curriculum consisted of didactic sessions (covering common EM chief complaints and differential diagnoses, research design and manuscript writing, and social justice and health equity), hands-on lessons (focused on ultrasound and common EM procedures), and in-person shadowing sessions. To address objectives 2 and 3, each URMF was paired with a mentor for general coaching and a research mentor to pursue a project during the program. Social events were regularly offered to facilitate relationship building within the URMF, faculty, and residents, furthering objectives 3 and 4. To assess the program's impact, URMF were asked to complete anonymous surveys at different times: two weeks prior, following various sessions, and two weeks after the program.

Results: From 2021 to 2023, 27 URMF participated from 16 allopathic (78%) and osteopathic (22%) medical schools. Comprising this diverse community, 67% of URMF identified as Latinx, 37% as Black, 44% as first-generation MS, and 11% as undocumented. Surveys prior to and following the program were compared using paired t-tests. URMF across all cohorts showed significant increases in confidence in their clinical reasoning, patient presentations, procedural skills, and ability to meaningfully contribute to EM research following the program (P=0.0001, P=0.0001, P=0.0001, and P=0.0001). Additionally, 2022 and 2023 URMF were significantly more confident in being able to obtain a mentor for: helping to resolve interpersonal conflicts, addressing concerns related to identity (eg, experiencing discrimination), career advice, and educational support (P=0.0001, P=0.0001, P=0.0001, and P=0.0003). Ultimately, URMF across all cohorts were statistically more likely to pursue EM following the program (P=0.0004). Thus far, of the URMF who have applied for residency, 80% matched into EM.

Conclusion: In conclusion, the URM EM fellowship has successfully reached a diverse MS population and achieved consistent results in improving clinical knowledge, research skills, and mentorship. The program's success across multiple years demonstrates both its sustainability and the longitudinal success of the URMF that have participated. We aim to share this model for other institutions to adapt and continue to advance ACEP's longstanding goal of diversifying the EM workforce to ultimately increase patient access to culturally-concordant care.

No, authors do not have interests to disclose

244 Using the National Early Warning Score (NEWS2) to Predict ICU Transfer in Admitted Emergency Department Patients

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Study Objectives: The National Early Warning Score (NEWS2) is an 8-point clinical tool (0-20 points) which uses vital parameters to identify early signs of deterioration in hospitalized patients. NEWS2 has been shown to predict morbidity and mortality in several patient populations, including those with sepsis and traumatic injuries. Its use in the emergency department (ED) remains underexplored. This study investigates its utility as a tool for predicting disposition or care escalation in recently admitted ED patients, with the goal of reducing unexpected floor to ICU transfers.

Methods: We conducted a retrospective chart review at an urban academic center from 6/1/2020 to 6/1/2022, including 120 adult ED patients admitted to floor or telemetry units. We included all patients who were escalated from floor to ICU hospitalization within 12 hours of admission. Patients who were admitted to Labor and Delivery, went directly to the operating room, or underwent a planned operation within 12 hours of admission were excluded. Comparative analyses with chi-squared and Fisher's exact tests were performed with 120 randomly selected control patients with similar admission types, dates, and care levels. Optimal NEWS2 cutoffs for predicting ICU admission were determined through logistic regression and receiver operating curve analyses.

Results: NEWS2 scores were significantly higher for patients requiring ICU transfer compared to those remaining on the floor, both at time of admission (2.8 +/-

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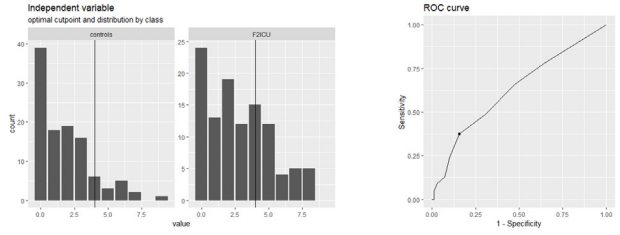
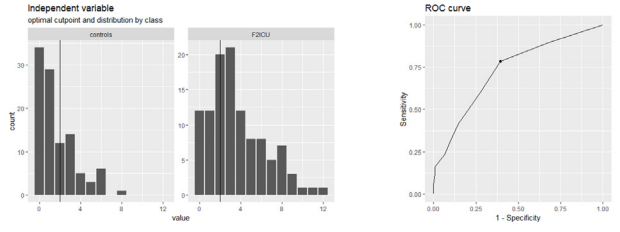
2.3 vs 1.8 +/- 2.0, p <0.001) and at time of transfer from the ED to the floor (3.6 +/- 2.7 vs 1.7 +/- 1.8, p <0.001). A NEWS2 cut-off of 4 at time of admission predicts ICU transfer with 61.0% accuracy, 37.6% sensitivity, and 84.4% specificity. A cutoff of 2 at time of transfer to the floor predicts ICU transfer with 69.8% accuracy, 78.4% sensitivity, and 60.6% specificity. Analysis of basic lab parameters showed no significant difference between patients requiring ICU transfer and controls; additionally demographic parameters (race, ethnicity, and age) were not significantly different between groups.

Conclusion: Higher NEWS2 scores at time of admission and floor transfer are associated with increased likelihood for escalation to ICU care. Given the rise in ED boarding, there may be a role for NEWS2 in the ED to monitor admitted patients for clinical decompensation. A larger validation study would be beneficial for identifying an optimal NEWS2 cutoff for ED monitoring given the limitations of this single-site study. Although relatively low NEWS2 scores are sensitive for predicting floor to ICU transfers, higher cutoffs would be needed in monitoring applications to prevent excessive provider notification and alarm fatigue. Further studies are also needed to explore the likelihood for clinical decompensation and escalation to ICU care in patients boarding in the ED compared to those who receive floor beds promptly.

Histogram and ROC plot for NEWS Score at Admission. Vertical lines in the histogram indicates cutoff.



Histogram and ROC plot for NEWS Score at Floor. Vertical lines in the histogram indicates cutoff.



No, authors do not have interests to disclose

245 Optimizing Room Size and Accessibility Improves Emergency Department Operational Metrics

Dayal D, Alarcon D, Connor M, McCullough L, Thomas N, Khan F, Hung-Yi Lee A/UCLA David Geffen School of Medicine, Los Angeles, California, US

Background: Many emergency departments (EDs) have implemented workflows that enable expedient evaluation of newly arriving patients even when most patient rooms are occupied by ED Boarders. One example is the Complete Medical Evaluation (CME) process at our institution, where physician and nursing teams rapidly evaluate and perform phlebotomy on new ED patients in designated CME rooms before patients move to other ED spaces to complete their work-up. However, boarding patients typically occupy the larger and better-equipped patient rooms, leaving smaller rooms or hallway spaces for ED teams to take care of new ED arrivals. As such, we exchanged four smaller CME rooms for four of the department's larger and more proximally located rooms typically occupied by Boarders and performed a pre-post study to analyze how this change impacts operational metrics.

Methods: We implemented the change in CME room designations on February 18, 2024 at our academic ED and compared operational metrics during the 6 week period pre- and post- intervention. The primary outcome was "CME Dwell Time" as defined by the median number of minutes patients spend in the initial evaluation room. Secondary outcomes included the median number of minutes from ED arrival until ED disposition and from provider evaluation until ED disposition. A sensitivity analysis of CME Dwell Time was performed with subgroup analyses for the unchanged CME rooms and for the newly added CME rooms. We used quantile regression to calculate changes in the median time spent in the initial evaluation room, from ED arrival to disposition, and from provider evaluation to disposition before and after the CME process intervention.

Results: 13,390 ED encounters (6,620 pre-intervention and 6,770 post-intervention) occurred over the study period. 2,056 out of 6,620 pre-intervention encounters (31%) and 2,193 out of 6,770 post-intervention encounters (32%) underwent the CME process. Pre-intervention and post-intervention patients had similar age (median 44 for both), gender (52% female for both), and race (37% White, 28% Hispanic, and 13% Black pre-intervention and 37% White, 27% Hispanic, and 12% Black post-intervention). The ED encounters also had comparable medical acuity as measured by Emergency Severity Index (ESI) (54% ESI 2 and 44% ESI 3 versus 54% ESI 2 and 43% ESI 3) and rate of hospitalization (27% admitted and 12% placed in observation versus 28% admitted and 9% placed in observation). Median "CME Dwell Time" decreased from 99 to 87 minutes (delta = -12 minutes, 95% CI -5 to -19), which was a 12% reduction. Median time from patient ED arrival to disposition decreased from 315 minutes to 265 minutes (delta = -50 minutes, 95% CI -36 to -64) and median time from provider evaluation to disposition decreased from 179 minutes to 166 minutes (delta = -13 minutes, 95% CI -2 to -24). Subgroup analysis found CME Dwell Time decreased in the reassigned CME rooms from 105 to 88 minutes (delta = -17 minutes, 95% CI -8 to -26) while there was no statistical difference in CME Dwell Time for the unchanged CME rooms. There were no reported adverse events related to implementation of the new workflow.

Conclusion: We sought to optimize our CME process by designating larger and more accessible rooms for new ED patient evaluations and found a statistically significant decrease in our primary outcome of median CME Dwell Time. Moreover, we demonstrated shorter time from ED arrival to disposition, and from provider evaluation to disposition. Subgroup analysis suggested these operational improvements may be attributable to the newly designated CME rooms. This program serves as a model for other health systems to redesign existing patient care spaces that are increasingly constrained by ED boarding to improve patient care and ED throughput.

No, authors do not have interests to disclose

EMF 246 Using Design Thinking and Community Advisors to Improve Emergency Department Resources for Intimate Partner Violence Survivors

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Study Objectives: Intimate Partner Violence (IPV) affects up to 1 in 4 women and 1 in 10 men, and leads to significant morbidity and mortality. Connecting survivors of IPV with advocacy and community resources is an important intervention. Emergency department (ED) encounters offer a crucial opportunity for making these referrals for survivors. However, challenges include the vulnerability of this specific patient population, accounting for barriers to help-seeking, and navigating a complex and ever-evolving network of community-based organizations (CBOs) catering to varying IPV-related needs. This study aimed to establish a Community Advisory Council (CAC) to better understand the perspectives of IPV survivors and CBOs on care in the ED. The CAC's objective was to identify unmet needs, especially around effectively linking survivors with services post-discharge, and to inform survivor-centered best practices for addressing them.

Methods: Five CBOs were purposively sampled from a pool of 17 local organizations serving survivors of IPV. The CAC comprised of leadership from these CBOs and represented the perspectives of domestic violence hotlines, emergency shelters, and other essential social and legal services for survivors. The populations served by these CBOs also reflected the diversity of an urban safety net hospital's patient demographic. Additionally, a multidisciplinary team, including medical students, physicians, and social workers, participated in CAC meetings. Using a human centered design thinking approach, the CAC conducted journey mapping to understand how survivors experienced the ED and to identify areas for improvement. The CAC also provided input on the iterative design of ongoing Quality Improvement (QI) work.

Results: Through quarterly meetings and an in-person ED walkthrough, the CAC identified seven areas for QI in the care of IPV survivors. These areas were survivor accompaniment, communication training, de-escalation training, adjusting the physical

environment, building trust with survivors, increasing accessibility of community resource referrals, and improving ED-CBO communication and collaboration. Feedback from the CAC informed the design and implementation of two new resources in the ED. The first was a clinician-facing digital tool used at the bedside to quickly identify community referrals for survivors of IPV, tailored to each survivor's demographics and specific social or legal need. The second was a series of new survivor-centered informational handouts available in multiple languages that included affirming language and a validated self-care checklist. Information about IPV services were incorporated discreetly into the handout for safer distribution to survivors.

Conclusion: Engaging a CAC to enhance QI efforts around care and referrals for IPV survivors in the ED yielded numerous actionable steps to better account for the unique needs of this vulnerable population. Future work will assess the effectiveness of the implemented ED resources. The newly formed academic-community partnership will also be continued, in order to address further opportunities for improving care for IPV survivors in the ED and linking them with essential community resources.

Yes, authors have interests to disclose

Disclosure: FujiFilm

Consultant/Advisor FujiFilm

Disclosure: SonoSite

Consultant/Advisor SonoSite

247 Evaluating Identified Unmet Social Needs in the Emergency Department Utilizing an Intersectionality Framework

Mook J, Zheng J, Yuan M, Moon G, Bess K, Purakal J/Duke University School of Medicine, Durham, North Carolina, US

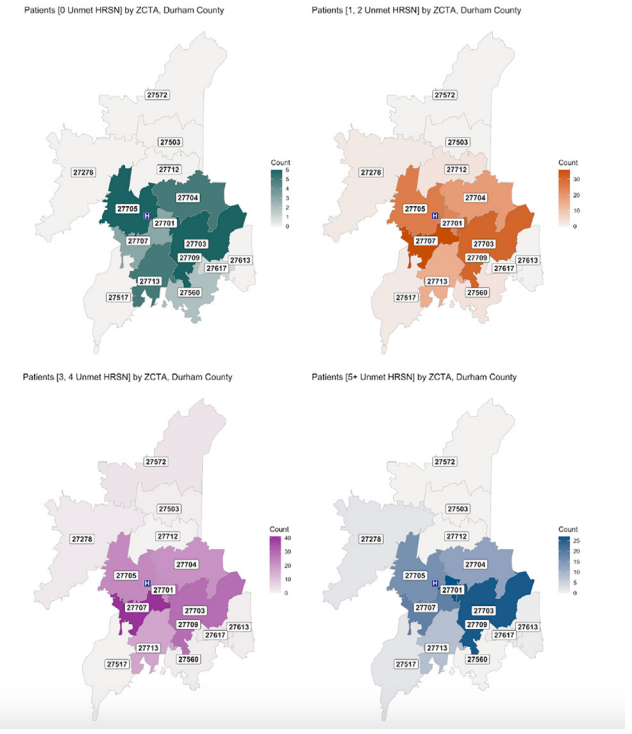
Study Objectives: Several studies have demonstrated the significant and disproportionate impact of unmet health-related social needs (HRSN) on health outcomes, specifically in the high-risk emergency department (ED) population. However, few studies have used an intersectionality framework to identify patient groups at greatest risk for these HRSN. This study utilizes an intersectional approach to evaluate ED patients' unmet social needs to better understand disparities and identify groups at high-risk for disproportionate social burden.

Methods: This cross-sectional quality improvement study included patients in the ED who completed a HRSN screening questionnaire and were subsequently provided need-specific resources, from October 2021 to October 2023 at an academic tertiary care hospital. Patients with identified unmet need(s) who wanted assistance were provided with locale-specific resources (phone numbers, websites) for their identified need(s), and were offered enrollment into "NCCare360", a statewide online platform to create and track social need referrals to community organizations. HRSN responses were grouped into four groups (G): G1=0 unmet HRSN, G2=1-2 unmet HRSN; G3=3-4 unmet HRSN; and G4=5+ unmet HRSN. Patient demographics and geospatial distribution were assessed utilizing an intersectional framework to better understand the population served.

Results: The cohort included 814 patients, which was predominantly Black (59%), Female (58%), and ages 25-35 (19%). Black patients were overrepresented in the cohort compared to the study site's ED census during the same period (59% vs 40%, respectively), while white patients were underrepresented (18% vs 46%) and Hispanic patients were appropriately represented (15% vs 16%). Further stratifying by high-risk social needs groups, Black females accounted for the largest proportion of respondents (G3=41.3% and G4=33.9%). When adding insurance type as a variable, only Black Males in G4 with Medicare or who were uninsured (G4=9.2% vs 7.5%; 5.7% vs 4.6%) and uninsured Hispanic Females in G3 (5.8% vs 4.0%) represented larger proportions of G3 and G4 than their Black female counterparts. Additionally, geospatial analysis found three zip codes (27701, 27703, 27707) that in combination accounted for the majority of high-risk social burden, regardless of racioethnic identity, gender, or insurance (G3=54%, G4=59%) [Figure].

Conclusion: This study identified phenotypes of the highest risk for significant burden of HRSN for the study institution's ED population. As universal screening for HRSN is not always feasible due to time and resource constraints, applying an intersectionality framework to an ED population's reported needs can identify high-risk groups who may benefit from additional in-depth screening and intervention. This study can serve as a framework for other institutions to identify high-risk groups within their patient population utilizing demographic variables.

Figure. Geospatial distribution of HRSN response groups by ZIP Code Tabulation Areas (ZCTAs) in Durham county. The approximate location of the study institution's ED is marked with an "H" symbol.



No, authors do not have interests to disclose

248 People Experiencing Homelessness Offer Suggestions for Improving Emergency Department Discharge Instructions for People Experiencing Homelessness

Morgan O, Supino M, Varshney J, Moore A, Moretensen C/University of Miami Miller School of Medicine, Miami, Florida, US

Background: At the time of discharge from the emergency department (ED), patients are given a clinical workup summary and instructions for outpatient follow-up. Adherence rates with instructions vary as follow-up likelihood may be influenced by several of factors, particularly among high-risk high-need populations such as people experiencing homelessness (PEH). Studies have documented numerous barriers experienced by PEH when trying to obtain follow-up care after discharge from the ED, often resulting in return visits to the ED. Few studies have examined whether the barriers were the stepwise end points of instructions directly given at discharge. It may be possible to reduce barriers if discharge instructions were adjusted so that they reflected the realities of PEH. The incentive for this study is to learn from those with lived experience about how to maximize the effectiveness of discharge instructions and address common follow-up barriers experienced by PEH.

Study Objectives: To survey PEH after receipt of ED discharge papers and assess whether follow-up instructions adequately addressed anticipated barriers, and suggestions for improving the information provided to better reflect realities and needs of PEH.

Methods: Non-critically ill patients presenting at a county teaching hospital ED from January-March 2024 were approached by a member of the research team to inquire about housing status. Those identifying as a PEH were informed about the survey and had the option to consent and participate. Survey questions were developed using the theoretical domains framework, which is validated for use in health care settings as part of implementation research to identify potential barriers and facilitators for updating clinical practices. Prompts had free form text options for qualitative data. No identifying information was collected in the survey, anonymous results were stored in a RedCap electronic medical record system then transferred to Dedoose web-based application where qualitative study methods outlined by Braun and Clarke were used to identify themes and select illustrative quotes.

Results: Survey of N=154 PEH identified four primary themes: 1) Include follow-up direction options that do not require phone calls, text messages, emailing, booking appointments online etc. Instructions that assume the reader has a phone or computer create a barrier, as many PEH have neither. 2) Use discharge summary planning as an

opportunity to address concerns and advise on how to navigate commonly encountered follow-up barriers. When instructions did not consider the difficulties of obtaining follow-up care, participants felt it made the information unrelatable and unreliable. 3) Include instructions about how to obtain medications and access a pharmacy outpatient. 4) Consistent messaging is key—PEH felt less motivated to follow instructions and confused about whether follow-up was even necessary when instructions noted that their conditions were unsuitable for ED-based treatment yet required extensive follow-up care.

Conclusion: In surveying PEH presenting to an ED about their discharge instructions, our study uses critical feedback and solution-oriented perspectives from this community about the design, feasibility, and usability of discharge instructional materials. Study outcomes may be limited, as PEH experience barriers to follow-up care due to a myriad of complex factors. We report solutions that are purposefully designed to overcome many obstacles documented in previous literature. Findings may be used to update discharge instructions to be more considerate of obstacles faced by PEH.

Theme	Illustrative Quote	Suggestion
1	"I don't know how to set up an appointment… Can't call, can't email. That's it then, I don't know where to go other than the ER."	Provide scheduling options besides call or email.
2	"They make it sound too simple to navigate, like there won't be so much red tape!"	Acknowledge potential difficulties, offer work around solutions.
3	"My issue is beyond appointments… I don't have a way to get my medicine."	Include pharmacy care in follow-up instructions.
4	"They take my blood pressure, say it's fine to leave but also say I need to now get meds for my blood pressure? Tell me how that makes sense." "If [ED staff] are not gonna take [my medical condition] seriously, why should I?"	If concerns are not addressed that day in the ED, make clear that some conditions that do not need to be treated emergently still need to be treated.

No, authors do not have interests to disclose

249 A Survey of People Experiencing Homelessness at a County Level Safety Net Emergency Department Assessing Communication and Comprehension of Discharge Instructions

Moore A, Supino M, Varshney J, Morgand O, Moretensen C/University of Miami Miller School of Medicine, Miami, Florida, US

Background: People experiencing homelessness (PEH) face high levels of disease burden and psychosocial factors increasing their rates of presentation to emergency departments (EDs) as well as return rates post ED discharge. The communication of instructions and content of educational materials provided may also be influencing PEH return rates. Given the high-risk high-need status of this population, it is paramount that we optimize controllable factors which include effective communication of discharge instructions and providing written materials designed for maximum usability for PEH.

Study Objective: To survey PEH and identify information gaps present in ED discharge instructions; to develop resource materials and interventions that will improve PEH follow-up care transitions post-ED discharge.

Methods: A survey was developed using the theoretical domains framework (TDF) which is a validated tool for use in health care settings as part of implementation research to identify potential barriers and facilitators influencing clinical practices to inform purposeful system level changes. The TDF synthesizes 33 behavioral change theories and 128 proven processes of implementation and integrates the information into 14 domains, creating a comprehensive lens to view healthcare systems-level protocols and guidelines implementation as processes that influence human behavior. Survey participants were recruited from a county level public teaching hospital ED from January to March 2024. Non-critically ill PEH were approached by a member of the research team to inquire about housing status. English and Spanish speakers self-identifying as a PEH were informed about the survey and had the option to consent and participate. De-identified results were stored in a RedCap electronic medical record system prior to downloading for analysis in R 3.2.0.

Results: Of 158 PEH approached, 2.5% (N=4) declined to participate and 97.5% (N=154) completed the survey – demographic characteristics include mean age 51.8 (SD 14.0), 79.6% male (N=121). Self-identified racial and ethnic backgrounds included 47.3% Non-Hispanic Black (N=72); 34.4% Hispanic White (N=53); 16% Non-Hispanic White race (N=18); 3.3% Hispanic Black (N=5); 3.9% Other (N=6); N=99 (66%) participants were enrolled in some form of insurance. After receiving discharge instructions, 66% of participants (N=99) reported that they understood the information provided. Of participants prescribed new medications, 50% (N=48) reported being told the reason for the new prescription medication and 23% (N=22) reported being told about potential side effects of taking the new medication. Of PEH surveyed, 50% (N=70) reported being given return precautions

Conclusion: Findings indicate ED discharge instructions are not optimized for maximal effectiveness. Results are particularly concerning given that the data collected is subject to social desirability bias which means true rates are likely even lower. It is well known that PEH face barriers obtaining outpatient care post-ED discharge which is attributable to a myriad of complex factors. Still, we believe it will help PEH adhere with their post-discharge follow-up plans if they are told the plan and understand what they are told. More research is needed to inform strategies for effective communication with this population, including pilot interventions to improve post-discharge plan communication to guide the development of instructional materials that are designed to benefit the patients who need them most.

No, authors do not have interests to disclose

250 Civil Monetary Penalties Related to Violations of the Emergency Medical Treatment and Labor Act Involving Patients Arriving or Departing With Law Enforcement

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Study Objective: The Emergency Medical Treatment and Labor Act (EMTALA) is intended to prevent inadequate, delayed, or denied treatment of emergent medical or psychiatric conditions by emergency departments (EDs). EMTALA requires all patients seeking care at EDs at hospitals with Medicare provider agreements to have a medical screening exam (MSE), stabilization of identified emergent conditions, and transfer if specialized services are needed for stabilization. This study describes EMTALA-related civil monetary penalty (CMP) settlements involving patients arriving to or departing from the ED with law enforcement.

Methods: Summaries of all EMTALA-related CMPs occurring 2002-2023 were obtained from the Office of the Inspector General (OIG) and reviewed for instances where patients arrived or departed with law enforcement. Characteristics of CMP events were described.

Results: Of 260 EMTALA-related CMPs, 15 (5.8%) involved patients arriving to or departing from an ED with law enforcement. Among these, 9 (60%) involved patients arriving to the ED with law enforcement, including 8 (88.9%) with psychiatric concerns; 5 (55.6%) were transported to alternate facilities by law enforcement without appropriate MSE at the direction of ED staff. One ED turned away paramedics transporting an incarcerated patient for whom the hospital had a "no trespass" order. Three CMPs involving patients arriving with law enforcement resulted in the discharge of patients, including one on an involuntary hold, another that had not been adequately evaluated for altered mental status, and a third held involuntarily in an ED for 38 days prior to discharge without management by the on- call psychiatrist or admission to an available inpatient bed. Among 4 CMPs involving patients discharged from the ED with law enforcement but not arriving with law enforcement, 2 involved patients brought to the ED for evaluation of psychiatric conditions were taken to jail without appropriate MSE after becoming combative in the ED. Two CMPs involved multiple patients with psychiatric issues sent to jail without appropriate MSE/stabilization, some due to hospital policies pertaining to alcohol intoxication. Two CMPs involved patients without noted psychiatric issues escorted out of the ED with the assistance of law enforcement. In one, a patient with a headache was escorted out by police after being noted to be resistant when asked to leave the waiting room; after transport by ambulance to another facility, they were diagnosed with bacterial meningitis. In another, a patient arriving by ambulance exhibited aggressive behavior and, before MSE, was escorted off the property by law enforcement, returning hours later in cardiac arrest and ultimately died.

Conclusions: One in 20 EMTALA related CMPs involved a patient arriving to or departing from the ED with law enforcement. Among these, most involved psychiatric emergencies. In many cases, law enforcement was advised to take patients to an alternate facility for evaluation or treatment without an MSE, or patients with noted psychiatric concerns were discharged to jail after combative behavior or due to noted alcohol intoxication without adequate MSE or stabilization. Findings indicate a need for provider education surrounding EMTALA requirements to provide MSEs and if needed, stabilizing treatment prior to discharge or transfer for all patients presenting to the ED, regardless of whether accompanied by or in the custody of law enforcement. Findings will guide future, more comprehensive evaluations of the universe of EMTALA citations related to the care of patients arriving to and departing from the ED accompanied by law enforcement.

No, authors do not have interests to disclose

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EMF 251

The Impact of Adverse Social Determinants of Health on Healthcare Utilization Among Heart Failure Patients in a Mobile Integrated Health Program

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Study Objectives: Adverse social determinants of health (SDoH) are associated with increased, unplanned healthcare utilization and worse clinical outcomes. This study explored the impact of SDoH among patients living with heart failure (HF) in high and low disparity communities on healthcare utilization and participation in a mobile integrated health program (MIH). We administered qualitative surveys and in-depth interviews to better understand how identified SDoH affected care-seeking behaviors.

Methods: *Study Sample*. This mixed-methods study surveyed HF patients randomized to the MIH arm of a multi-center clinical trial "Using Mobile Integrated Health and Telehealth to support transitions of care among patients with Heart failure" (MIGHTy-Heart). Enrolled patients received home visits by community paramedics who facilitated telehealth encounters with emergency physicians. Participants were eligible for this sub-study if enrolled in MIH for at least one month, had at least one MIH visit, and spoke English or Spanish. Patients were stratified into "High" (HD) and "Low" (LD) health disparity communities based on zip code according to the New York City Department of Health annual Community Health Survey.

Data Collection. Participants meeting eligibility criteria were contacted by phone, completed an audio-recorded phone interview and were compensated for their time. Research assistants completed a standardized SDoH survey including the following domains: affordability of care, primary source of care, housing concerns, social support, functional status, mental health, transportation, and health literacy. Survey responses were used as probes for discussion. Structured chart reviews were completed for healthcare utilization, primary care provider (PCP), insurance coverage, and MIH visit data, including number of visits, medication nonadherence, dose changes, lasix administration, and emergency department (ED) referrals.

Data Analysis. Descriptive statistics were used to summarize quantitative data with Wilcoxon rank sum, Chi-square, or Fisher's exact tests of association as appropriate. Open-ended questions were transcribed and coded by three researchers using directed content analysis with both deductive and inductive coding to identify emergent themes across interviews.

Results: Data was collected from 25 patients in LD and 25 patients in HD over two months with 11% response rate. Compared to patients in LD, patients in HD areas were more likely to be Black or Hispanic/Latino (76% vs 44%). Age, education level, marital status, and living situation were similar between groups. Survey responses suggested participants in both communities struggled with adverse SDoH: more than 60% of all participants expressed difficulty paying for food, housing, utilities, or medical care. Those in HD communities more often noted concerns with housing conditions, safety, and cost (52% vs 20%, $p = 0.018$), specifically difficulties paying rent (36% vs 12%, $p = 0.047$). One patient described rain entering their room causing mold. Another person shared "there are people fornicating, doing their drugs" in stairwells. Some people are in housing disputes. A patient in HD summarizes: "I need someplace [else] to live. I want to feel safe." Healthcare utilization was similar between groups with respect to ED and PCP visits. MIH visits were also similar, although patients in the HD group more frequently received intravenous lasix during a home visit (33% vs 14%, $p<0.001$).

Conclusion: Although the prevalence of adverse SDoH was high among MIGHTy Heart subjects living in high and low health disparity communities, housing insecurity and safety concerns were more prevalent among those in HD areas. This finding is likely to impact MIH programs geared towards home-based care, and additional resources may be needed in this group. Furthermore, although healthcare utilization, particularly ED visits, was similar among those in HD and LD communities, HD patients more frequently received lasix at home, suggesting active treatment may have prevented unplanned ED visits in this group.

Characteristic	High, N = 25[1]	Low, N = 25[1]	p-value[2]
Length of Participation in CTP, Months	20 (12, 28)	19 (11, 28)	0.7
Age	68 (61, 77)	70 (63, 81)	0.5
Race			<0.001
Asian	0 (0%)	1 (4.0%)	
Black/ African-American	18 (72%)	8 (32%)	
Hispanic or Latino	5 (20%)	3 (12%)	
Other	1 (4.0%)	1 (4.0%)	
White	1 (4.0%)	12 (48%)	
Spanish-speaking Only	2 (8.0%)	0 (0%)	0.5
Marital Status			0.12
Divorced or separated	4 (16%)	2 (8.0%)	
Living with domestic partner	0 (0%)	3 (12%)	
Married	3 (12%)	8 (32%)	
Single	15 (60%)	9 (36%)	
Widowed	3 (12%)	3 (12%)	
Education			0.5
Associate's degree	3 (12%)	0 (0%)	
Bachelor's degree	2 (8.0%)	4 (16%)	
Doctoral degree	3 (12%)	1 (4.0%)	
Eighth grade	1 (4.0%)	1 (4.0%)	
High school	8 (32%)	5 (20%)	
Master's degree	3 (12%)	6 (24%)	
Some college	4 (16%)	6 (24%)	
Some high school	1 (4.0%)	2 (8.0%)	
Living Arrangement			0.8
Alone	11 (44%)	9 (36%)	
Friend or roommate	1 (4.0%)	2 (8.0%)	
Multiple family members	3 (12%)	5 (20%)	
Single family member (spouse, child)	10 (40%)	9 (36%)	
Responsible for Care			0.8
A family member or friend	3 (12%)	4 (16%)	
A home health aide or similar type of assistance	2 (8.0%)	3 (12%)	
Myself	20 (80%)	18 (72%)	

[1] Median (IQR); n (%)
[2] Wilcoxon rank sum test; Fisher's exact test

No, authors do not have interests to disclose

252 Overdose Following Medication for Opioid Use Disorder Initiation After Emergency Department Visit

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Study Objective: An emergency department (ED) visit for patients with opioid use disorder (OUD) may represent an opportunity to start medication for OUD (MOUD), including buprenorphine, methadone or naltrexone. This study aimed to determine overdose outcomes associated with starting MOUD within 7 days of an ED visit.

Methods: This was a retrospective observational study using a subset of the Oregon Comprehensive Opioid Risk Registry (CORR) database, comprised of: 1) the Oregon All Payer Claims Database (APCD), which includes Medicaid, Medicare, and commercial insurance claims for approximately 80% of Oregonians from 2013-2020; 2) the Oregon prescription drug monitoring program (PDMP); 3) Oregon vital records death certificates; 4) emergency medical services (EMS) calls; and 5) the Oregon hospital discharge database. We identified patients 18 years old and older with diagnosis codes related to OUD (ICD-10 codes F11.1x-F11.2x and F11.9x) that were recorded in an ED visit in 2017-2019 that resulted in a discharge (ie, not admitted or transferred). We included patients who had continuous insurance enrollment six months before and twelve months after the index ED visit but allowed up to a sixty-day gap in coverage. We included only the first episode in that time period. We excluded individuals who had an OUD-related hospital visit in the prior six months, or those with evidence of MOUD treatment (either a billing code for clinic administered buprenorphine, methadone or naltrexone, or a PDMP record of a dispensation of an OUD formulation for buprenorphine) in the previous six months. The main exposure was receiving outpatient MOUD treatment in the seven days post-ED visit. Patients were followed 6 months and 12 months post-discharge and we assessed the first occurrence of a non-fatal or fatal opioid-related event. Non-fatal opioid overdose events were captured from hospital discharge records and APCD ED insurance claims for any opioid poisoning events (ICD-10 codes T40.0, T40.1, T40.2, T40.3, T40.4, and T40.6). Fatal opioid overdose events were captured using underlying cause-of-death ICD-10 codes. We used a logistic model to investigate the association of having an opioid overdose event and receiving OUD treatment 7 days post index visit.

Results: There were 8,345 patients discharged after an ED visit. 50.6% (n=4,226) were male, the majority (65.5%, n=5,469) had Medicaid insurance, and the majority (51.3%, n=4,278) had 3 or more comorbidities recorded. 694 patients (8.3%) had evidence of MOUD initiation within 7 days of discharge. The overall fatal or non- fatal overdose rate at 6 months was 2.9% (n=244) and at 12 months was 5.1% (n=423). The 6-month overdose rate was 2.0% (n=14) for patients who received MOUD and 3.0% (n=230) for patients who did not. The 12-month overdose rate was 5.0% (n=35) for those who received MOUD and 5.1% (n=388) for those who did not. In the adjusted analysis, there was a decreased odds of fatal or non-fatal overdose in the 6 months after MOUD following an ED visit (0.57, 95% CI 0.33-0.98), but the difference was non-significant at 12 months (0.85, 95% CI 0.59-1.21).

Conclusions: Patients who received MOUD within 7 days after ED discharge had a significantly decreased odds of fatal or non-fatal overdose within 6 months of discharge. An ED encounter for patients with OUD is an opportunity to initiate this life-saving treatment. Further research is needed to determine why outcomes at 12 months were not different.

Yes, authors have interests to disclose
Disclosure: Bicycle Health
Stockholder Bicycle Health
Disclosure: Cessation Therapeutics
Consultant/Advisor Cessation Therapeutics
Disclosure: Vertex Pharmaceuticals
Consultant/Advisor Vertex Pharmaceuticals

253 Prescribing Patterns and Patient Factors in an Emergency Department-Initiated MOUD Program to Combat Opioid Use Disorder Throughout a Changing Landscape

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Study Objectives: Opioid overdose (OD) is a leading cause of morbidity and mortality, and emergency medicine has been on the forefront of developing programs for patients with opioid use disorder (OUD). Emergency department (ED) initiated medication for opioid use disorder (MOUD) has been shown to improve outcomes in patients with OUD. Our hospital began a program for ED-initiated MOUD during the opioid epidemic. This program has continued through many changes, including perceptions of treatment options for patients with OUD, a world-wide pandemic affecting access to care, and changes to regulations (eg, X-waiver requirements). The purpose of this study was to determine the prescribing patterns and patient factors in an ED-initiated MOUD program longitudinally from 2017-2023.

Methods: This was a retrospective IRB-approved review of patients presenting to a large urban Midwestern ED at high risk for opioid OD which consisted of a secondary analysis from patients previously presented (November 2017-December 2020, n=1676 to determine outcomes of subsequent ODs) and additional ongoing analysis (January 2021 to July 2023). Additional analysis was undertaken due to several factors: 1) post-COVID timeframe, 2) removal of X-waiver requirements in January of 2023. Patient demographics, social determinants of health, and prior history of OUD and prescription use were determined. The primary outcome of this study was ED-initiated MOUD. Comparisons were made using binary logistic regression and Chi-squared analysis.

Results: Increase in ED-initiated MOUD prescribing each year from 9% to 40% ($P<0.001$). When the X-waiver requirements were removed, prescribing rates increased from 27% to 40% ($P<0.001$). No difference was seen in prescribing patterns by race or gender. Patients with Medicaid were more likely prescribed ED-initiated MOUD vs self-pay (24% vs 11%, $p<0.01$). Patients prescribed ED-initiated MOUD had higher rates of prior OUD history (23% vs 16%, $p<0.01$), previously prescribed take-home naloxone (9.6% vs 3.2%, $p<.001$), and previously longer course MOUD (28 pills filled or more, 31% vs 12%, $p<.001$). Current data (11/2017-9/2023) confirmed our previous finding (11/2017-12/2020) that patients on longer course MOUD have a decrease in 90-day OD (5.3% vs 2.7%, $p=.021$) and 6-month OD death (1.2% vs 0.9%, $p=.036$).

Conclusion: Prescribing rates of ED-initiated MOUD have continued to increase despite a changing landscape of ED practice, with continued improvement in morbidity and mortality. Understanding patient factors and prescribing patterns may help further influence the use of ED-initiated MOUD.

No, authors do not have interests to disclose

254 Emergency Department-Based Medication for Opioid Use Disorder: A Five-Year Experience

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Background: Medication for opioid use disorder (MOUD) programs have been shown to be successful in treating opioid use disorder (OUD) patients. Successful programs are resource-intensive. We describe our 5-year emergency department (ED)-based MOUD program results, including expanding our existing program into free-standing EDs using telehealth.

Methods: Our MOUD program uses addiction care coordinators (ACC) to provide screening, physical assessments, medication administration, patient education, and outpatient referrals for OUD patients presenting to our ED. ACCs coordinate care to ensure patients stay on their treatment course while navigating a complex healthcare environment. Peer recovery specialists also provide counseling to our OUD patients. Our MOUD program is available 24 hours daily at our two full-service hospitals. In November 2021, we expanded our MOUD program to our two free-standing EDs using a telemedicine platform. Nurses at the free-standing EDs were trained on MOUD principles, and treatment and consultation with the ACCs were done through telemedicine using iPads and Epic electronic health records. Outcomes included the number of patients inducted through the MOUD program over a five-year period (2019-2023), the number inducted through telehealth, and the retention rate in the MOUD outpatient program at 1 and 6 months.

Results: A total of 373,797 patients were screened for OUD over the 5 years, and 1,072 (2.8%) were inducted into the MOUD program during their ED visit. We had a total of 53 patients (4.9%) inducted through our telemedicine MOUD program. The overall retention rate was 28.6% at one month and 23.7% at 6 months. The retention rate for the telemedicine MOUD cohort was 33.3% at one month and 25.0% at one month ($p > 0.05$). The number of patients inducted and retained into the MOUD program declined over the years (Figure). According to state data, the number of opioid and buprenorphine prescriptions also went down over this five-year period. Inpatient admission for OUD did not increase over the 5 year period.

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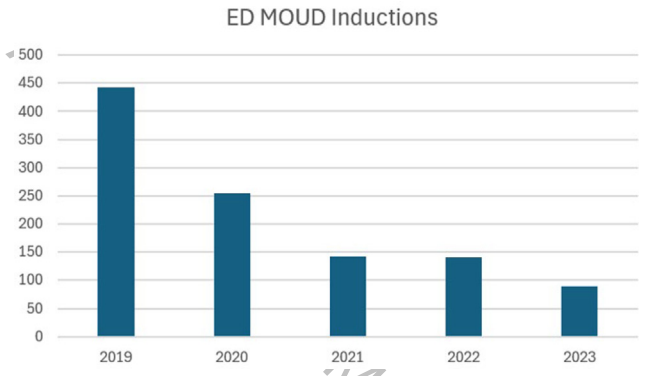
Conclusion: MOUD programs expand access to treatment for patients with OUD. They can also be expanded successfully to free-standing EDs through telemedicine. Patients' use of the ED-based MOUD program has declined each year, and retention rates have fallen. Several factors could be involved, such as increased strength of fentanyl, worsening withdrawal symptoms, increased inpatient admission for OUD, and expansion of MOUD to other community sites.



No, authors do not have interests to disclose

255 Understanding the Barriers of Emergency Physicians to Prescribing Medically Assisted Treatment for Alcohol Use Disorder

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Study Objectives: The goal of this study is to identify barriers that lead to the under-prescribing of naltrexone for medically assisted treatment (MAT) for alcohol use disorder (AUD) upon discharge from the emergency department (ED).

Background: Since 2005, the National Institute on Alcohol Abuse and Alcoholism has recommended anti-craving medications be considered for every patient with alcohol dependence, as they are both safe and effective. Despite that recommendation, studies show fewer than 10% of patients with AUD in the US receive either specialty alcohol treatment or medical management. Studies have demonstrated that even in the absence of psychosocial support, the use of MAT can reduce heavy drinking days. It has been shown that physicians would increase their prescription of medications to treat AUDs if they had more training. Our work aims to understand what other perceived barriers exist to emergency department prescribing and initiation of MAT for eligible patients.

Methods: The team conducted five separate focus groups with a total of thirteen emergency physicians. The interviews were designed to understand the possible barriers that exist for the prescribing of MAT for AUD. The interviews were transcribed and using a grounded-theory approach, themes were identified from the transcripts. Six team members participated in the thematic analysis and all disagreements were resolved through discussion and consensus. The project was approved by the Hackensack Meridian Health IRB.

Results: Six themes were identified in the focus groups (Table). The top 4 themes: 1) Provider Knowledge (demonstration of cursory knowledge or general lack of knowledge); 2) Not having a system during the course of care (no time, no guideline/pathway, nor discharge instructions); 3) Patient Safety Factors (lab results, social situations, poor history, currently intoxicated); 4) Concern for lack of follow-up, accounted for over 95% of the text.

Conclusions: Clinicians were most concerned with not having enough knowledge about MAT, not having a well-defined system in place in the department for naltrexone prescription, and patient safety factors. Using the information from these interviews and a survey filled out by 48 physicians (preliminary results presented at ACEP 2023), we are working to create a short educational video addressing these themes. The video will then be shown to physicians across the network and we will seek to understand the impact of this video through surveys and electronic health record data mining. This study received funding from the New Jersey Healthcare Foundation #PC 172-23.

Table: The identified themes, in order of most discussed; a representative quote is chosen for each one.

Theme	Proportion of Transcript	Example of Text
Provider Knowledge (demonstration of cursory knowledge or general lack of knowledge)	36%	"[I] definitely have more experience with treating withdrawal than active alcohol use"
Not having a system during the course of care (no time, no guideline/pathway, nor discharge instructions)	28%	"I think like a guideline or a pathway or something [would motivate ED physicians to prescribe MAT for AUD]. A clear and concise one that is easy to fall back on. I think taking out the subjectivity of deciding who and when to treat can encourage a lot of providers to use it."
Patient Safety Factors (lab results, social situations, poor history, currently intoxicated)	20%	"And the degree of their like health education. You know like, this is a treatment for alcoholics, and like, treatment for withdrawal even, and I just think that, 'Oh, I'm like having new symptoms, I'm just gonna take this and I'll be fine like…' "
Concern for lack of follow-up	12%	"And like I was saying, I don't have any problem like giving recommendations, it's just a matter of are we able to help them continue following up if that's not the case, then… No, I feel like what might actually be doing a [dis]service"
Patient Choice for AUD MAT	3%	The rehab thing is the biggest issue that I feel like we have to face often. Because they're like "I don't want to go, I just want to keep drinking," and I don't know how to help them.
General Statements of Support of AUD MAT	1%	I think we're [the ED] probably a valuable point of contact for these patients to actually make a difference.

Table 1: The identified themes, in order of most discussed; A representative quote is chosen for each one.

No, authors do not have interests to disclose

256 Buprenorphine Treatment After an Emergency Department Visit for Non-Fatal Opioid Overdose

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Study Objectives: Studies have shown that initiation of medications for opioid use disorder, including buprenorphine, following a non-fatal opioid overdose, increased engagement in addiction treatment and reduced fatal overdose risk in the year following the non-fatal event. This study described buprenorphine treatment patterns and examined the association of extended-release buprenorphine (BUP-XR) and transmucosal buprenorphine (BUP-TM) on subsequent non-fatal opioid overdose emergency department (ED) visits following a non-fatal opioid overdose ED event.

Methods: In this retrospective cohort study using IQVIA's PharMetrics® Plus claims database, 8,868 patients with a non-fatal opioid overdose ED event (index date) between March 2018 and December 2021 were identified and followed for up to 1 year after their index date (variable post-index period). Treatment patterns were assessed, and a Cox proportional hazards model was used to examine buprenorphine treatment as a time-varying exposure to assess time to first post-index ED opioid overdose.

Results: Following the index non-fatal opioid overdose ED visit, 17% of patients received buprenorphine treatment post-index. Among patients who initiated buprenorphine post-index, the average time to treatment initiation was 91.9 (standard deviation: 94.5) days from the index overdose. The crude incidence rate of post- index ED opioid overdoses was 10.7, 10.2, and 7.3 per 100 person-years for patients with no buprenorphine, BUP-TM only and BUP-XR (with/without BUP-TM), respectively. In adjusted Cox models, BUP-XR treatment (with/without BUP-TM) was associated with a 33% reduction (Hazard ratio [HR]: 0.67; 95% Confidence Interval [CI]: 0.48-0.92) in risk of post-index ED opioid overdose compared to patients with no buprenorphine. There was no significant difference in post-index ED opioid overdose between patients with BUP-TM only treatment [HR: 0.45; 95% CI: 0.12-1.71) compared to patients with no buprenorphine.

Conclusion: The low utilization of buprenorphine treatment after a non-fatal opioid overdose highlights the importance of continuing to expand buprenorphine induction in the ED setting.

Yes, authors have interests to disclose

Disclosure: Indivior

Employee Indivior

Disclosure: IQVIA

Employee IQVIA

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257 Utilization of a Type-1 Emergency Department Observation Unit for Rapid Very-Low-Dose Buprenorphine Induction in Patients With Opiate Use Disorder

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Study Objective: To determine the feasibility of utilizing a type-1 emergency department (ED)-led Observation unit to treat patients with opiate use disorder transitioning to buprenorphine.

Background: Buprenorphine can be a life-saving medication for people with Opioid Use Disorder (OUD). The main barrier to treating patients with OUD with buprenorphine is related to the difficulty initiating the medication, particularly given the risk of precipitated withdrawal. To avoid this, standard buprenorphine induction techniques involve waiting for patients to reach moderate withdrawal before administering the medication. Alternatively, very low dose induction techniques (initially described as the Bernese Method) have been described in addiction literature. Such protocols rely on slowly increasing the buprenorphine dose while maintaining a dose of an opioid full agonist. Observation units could serve as a safe and cost effective setting to support patients with OUD interested in buprenorphine induction in a medically supportive setting with access to multidisciplinary care providers. This study evaluates the feasibility of using an ED observation unit for induction of buprenorphine utilizing a rapid 3-day very low-dose induction protocol.

Methods: This is an observational study of patients placed in New York City Health & Hospitals Kings County Observation Unit from June 1, 2023 to December 31, 2023 for induction onto buprenorphine. Patients were placed in observation according to an established observation unit protocol. Patients were excluded if they had a concomitant acute medical need that required admission to the hospital (including alcohol withdrawal), unstable vital signs, or methadone maintenance dose greater than 120mg per day. The institutional treatment protocol for rapid very low dose suboxone initiation was developed by our addiction medicine team and approved by the pharmacy and therapeutics committee. Feasibility is determined by a success rate greater than 35% (Success is defined as titration to full dose buprenorphine films ($\geq$ 8mg suboxone) or long-acting buprenorphine injection (300mg subcutaneous) on the day of hospital discharge. Data on hospital admission rates and follow-up with the addiction medicine team were also collected. Data are summarized as median and quartiles for continuous variables and percentages and 95% confidence intervals for categorical variables.

Results: A total of 22 patient visits were included. 12 patients were male (54.5%). 13 self-identified as black (59.1%), 2 self-identified as white (9.1%), and 7 as "other" (31.8%). In the year prior to the observation stay, the patients included averaged 3.2 visits to the Kings County ED. 5 of the patients (20.8%) had previously tried suboxone. 12 patients (50%) initially visited the ED for symptoms of withdrawal, 2 (8.3%) for unintentional overdose, and 9 (37.5%) for other reasons. 11 of 22 patients (50.0%) had follow-up with our addiction medicine team within 90 days of discharge from the hospital. Overall, 13 visits reached the feasibility endpoint (59.1%). 11 patients (50%) received a subcutaneous injection of long-acting buprenorphine. 9 patients (40.9%) requested to be discharged prior to completion of the very low dose induction.

Conclusion: The rapid very low-dose titration of buprenorphine protocol in our ED observation unit resulted in a success rate of 54.2% percent indicating the feasibility of implementing such a protocol. Furthermore, 50% of patients were discharged following long-acting buprenorphine injections to provide at least one month of MAT and 54.2% of patients had subsequent follow up as outpatients with our addiction medicine team.

No, authors do not have interests to disclose

258 Safety of a Community Tele-Paramedicine Program: Results of a Quality Assurance Review

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Background: The Community Tele-Paramedicine (CTP) Program was first piloted in our emergency department (ED) in 2019. This service cares for complex, chronically ill patients by bringing ED care into their home, often after recent ED visits or inpatient hospitalizations. At the time of program initiation, CTP focused heavily on CHF patients. There was little to no available data on quality assurance (QA) for similar programs nationwide. As such, initial internal QA processes focused on assessing the quality of care delivered. More recently, as the program has evolved to include other patient population subgroups, the process has evolved, shifting focus to track and assess patient outcomes and the program's efficacy in caring for a complex patient population.

Study Objective: CTP combines paramedic home visits coupled with emergency physician (EP) telehealth visits to bring ED care to the home to manage patients living with multiple chronic illnesses, including heart failure. We describe the results of a QA program implemented with an aim to monitor interventions and outcomes such as ED return visits or readmissions associated with CTP visits.

Methods: CTP operates within a large, urban, integrated health system serving six academic and community hospitals. Patients are referred after an acute care episode such as an ED visit or hospital admission. Weekly chart reviews were performed to abstract clinical data including patient and visit information, EP name, medications administered, ED transports during encounter, return ED visit and/or hospital admission within 30 days of CTP visit, and 30-day readmissions. All return visits were reviewed during CTP and departmental QA committee meetings comprised of CTP EPs, CTP medical director, and departmental quality leaders to assess adverse events (medication errors/reactions, unexpected changes in clinical condition, unplanned healthcare visits or death) related to CTP encounters and determine if return visits were preventable.

Results: A total of 2,200 visits were reviewed between 08/2022-03/2024, including 1051 unique patients. On average, 16.3 new patients were enrolled monthly, for a total of about 55.3 patients seen monthly, accounting for about 115.8 CTP visits per month. Medications were administered in 394 visits (17.9%), most commonly intravenous furosemide (93.4%) with a mean dose of 104.1mg (range: 20-200mg). Only 84 (3.8%) CTP visits resulted in immediate ED transport. There were 247 (11.2%) ED visits within 30 days of a CTP visit resulting in 159 (7.2%) admissions. Among patients enrolled, the mean number of 30-day return ED visits and readmissions was 2.7 and 2.3 events per month, respectively. During the study period, 13 CTP patients expired (1.2%). Monthly QA reviews did not identify adverse events or preventable return ED visits or admissions.

Conclusion: Quality review of CTP operational data identified few patients that required immediate ED transport, at only a rate of 3.8%. This suggests the majority of patients can be managed by such a program without need for escalation to the level of ED care. The relatively low morality rate of 1.2% and only 2.7 and 2.3 events monthly of 30-day return visits and 30-day readmissions in medically complex patients highlights the program's efficacy. The absence of serious adverse events related to CTP participation suggests that CTP can safely manage patients at home following acute care encounters and optimize care delivery.

No, authors do not have interests to disclose

259 A Virtual Physician Evaluation in the Emergency Department Waiting Room Reduces the Frequency of Left Without Being Seen Events: A Pilot Study

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Study Objectives: We piloted a virtual physician evaluation (VPE) program to initiate diagnostic testing for patients waiting for an emergency department (ED) evaluation. The program goals were to reduce left without being seen (LWBS) events, expedite diagnostic testing, and improve overall ED throughput.

Methods: This is a retrospective analysis of administrative data from a single urban, tertiary care center ED with an annual volume of over 80,000 adult patients. Depending on waiting room census and staff availability, VPE shifts were conducted on Monday and Tuesday afternoons (13:00-19:00). The video conferencing platform allowed for conversation, visual inspection, and specific examination of the ears, nose, throat, heart, and lungs. VPE physicians ordered initial diagnostic testing without direct interaction on most patients in the waiting room patients based upon review of the triage note and prior medical records. VPE physicians selected some patients with Emergency Severity Index (ESI) category 2 or 3 virtual evaluation at their discretion. All video evaluations were logged, and an administrative registry provided retrospective data for all ED patients during the VPE pilot period. This analysis includes all ESI level 2 or 3 patients who presented after 13:00 on Mondays or Tuesdays during the 6-month pilot. Chi square tests compared subject-level frequency of LWBS and t-tests compared ED turnaround times (time from ED arrival to final disposition, TAT) between subjects who did and did not receive a virtual evaluation. Multiple variable logistic regression estimated the association between days with a VPE shift and ED-level LWBS and TAT.

Results: From April to September 2023, 7,532 ESI level 2 and 3 patients presented to the ED on a Monday or Tuesday after 1300, 110 (1.5%) of which received a face-to-face

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virtual evaluation during 21 VPE shifts (average 5.2 patients per shift). Days with a VPE shift were busier (261 vs 256 patients per day, p<0.001) with higher average waiting room volumes (13.3 vs 12.2 patients per day, p<0.001). Age and sex distributions were similar between VPE and non-VPE patients, but VPE patients were more likely to be ESI level 3 (67% vs 54%). Compared to patients not seen through the VPE process, VPE patients were less likely to LWBS (0% vs 4.6%, p=0.021) and had faster times from room arrival to disposition (mean difference 74 [95% CI 30 - 117] minutes) but not total TAT (mean difference 21 [95% CI -22 - 65] minutes). Adjusted for age, sex, acuity, ED volume, and hourly waiting room census, presentation on a VPE day was associated with lower odds of LWBS (OR 0.79; 95% CI 0.63 - 0.99). Patients presenting on VPE days also had faster turnaround times (12.1 [95% CI 1.5 - 22.88] minutes) adjusted for age, sex, acuity, provider type, admission status, ED volume, and average waiting room volume.

Conclusion: On an individual patient level, VPE evaluation of ESI level 2 and 3 patients while awaiting room placement was associated with lower risk of LWBS events and shorter time to disposition once roomed. On an ED level, the addition of VPE shifts was associated with lower odds of LWBS and faster overall turnaround times for level 2 and 3 patients.

No, authors do not have interests to disclose

260 Comparison of Mobile Cardiac Outpatient Telemetry Initiated From the Emergency Department Versus Other Settings

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Study Objectives: Mobile cardiac outpatient telemetry (MCOT) has become an invaluable tool in the diagnosis and management of arrhythmias and other cardiac conditions. While MCOT devices can be initiated from various settings including clinics, hospitals, and homes, their utilization directly from the emergency department (ED) poses unique benefits and challenges. Given the critical nature of symptoms like syncope, palpitations, and near-syncope frequently managed in the ED, starting MCOT in this setting could potentially lead to earlier diagnosis and intervention. Comparison of the outcomes of MCOT initiated in the ED with those initiated in other settings is essential to understand how location influences diagnostic success and patient management.

Methods: This retrospective review included all patients at an urban academic medical center in a 27-month period that underwent application of a mobile cardiac outpatient telemetry (MCOT) patch device prior to discharge from the ED. The decision to provide a patient with a patch was per provider discretion. These devices were prescribed for a 14-day period and were capable of continuous monitoring and transmission for the full duration. Data including arrhythmia information and compliance metrics were collected from the online device management suite. Significant arrhythmias were defined as ventricular tachycardia (VT) ≥4 beats, supraventricular tachycardia (SVT) ≥4 beats, ≥3 second pause, second degree Mobitz II, third degree AV block, atrial fibrillation, or ventricular fibrillation. The data collected from these devices was compared to aggregate statistics provided by the device manufacturer of all patients nationally in a 12-month period who had received the same device from any location (eg, ED, clinic, hospital, or mail-delivery).

Results: In total, 1,265 patients underwent MCOT placement and data was received from 98.3% of patients. Wear time and compliance was similar between the local and national cohorts (local median 13.6 days vs national median 13.7 days, ED 98.3% vs all settings 98.8%). The percentage of patients with arrhythmias, excluding constant atrial fibrillation, was 67.4% locally compared to 78.6% nationally. Multiple arrhythmias (≥2) were found in 23.2% of local cases versus 31.7% nationally. Notably, the percentage of symptomatic events was higher locally (80.8%) than nationally (68.6%), and arrhythmias during these events were slightly more common in the local cohort (18.3% local vs 15.3% national). VT of ≥8 beats had a local detection rate of 8.5%, compared to 11.2% nationally. For SVT, local detection rates for episodes of ≥8 beats were 46.9%, somewhat lower than the 53.4% seen nationally. In terms of AF, local rates were lower across all types—paroxysmal, permanent, and combined—compared to national figures (9.7% locally vs 13.2% nationally for all AF cases). The study did not detect any cases of polymorphic VT, Torsades de Pointes (TdP), or Ventricular Fibrillation (VF) in either cohort. Time to first arrhythmia was comparable between both groups.

Conclusion: Compliance and wear time for MCOT are remarkably similar between patients initiated in the emergency department and those in other settings. Although the percentages of detected arrhythmias are slightly higher across all settings compared to the ED alone, the differences are modest, suggesting comparable diagnostic effectiveness. These findings affirm that the ED remains a viable and effective location for initiating MCOT, providing timely and critical diagnostic data that is largely consistent with broader clinical settings. This reinforces the utility of MCOT in the ED as an important tool for early arrhythmia detection and management.

Table 1: Summary of Arrhythmias

Arrhythmia	Local Count	Local Percent	National Percent
Ventricular tachycardia (≥8 beats)	95	8.5%	11.2%
Ventricular tachycardia (≥4 beats)	239	21.5%	28.0%
Pause (≥3 seconds)	39	3.5%	5.2%
AV block (2nd degree Mobitz II or 3rd degree)	15	1.3%	2.6%
Paroxysmal atrial fibrillation	70	6.3%	7.5%
Permanent atrial fibrillation	38	3.4%	5.7%
All atrial fibrillation	108	9.7%	13.2%
Supraventricular tachycardia (≥30 seconds)	69	6.2%	6.4%
Supraventricular tachycardia (≥8 beats)	523	46.9%	53.4%
Supraventricular tachycardia (≥4 beats)	689	61.8%	68.9%
Polymorphic VT, TdP, or VF	0	0.0%	0.0%

Table 1: Comparison of significant arrhythmias recorded between local patient population versus aggregate statistics for national data. (VT = ventricular tachycardia, TdP = Torsades de Pointes, VF = ventricular fibrillation)

Table 2: Summary of Wear Statistics

Wear Statistic	Local	National
Percentage with arrhythmia (excluding 100% AF)	67.4%	78.6%
Percentage with multiple arrhythmias (≥2)	23.2%	31.7%
Percentage with symptomatic events	80.8%	68.6%
Percentage with arrhythmias during symptomatic events	18.3%	15.3%
Percentage meeting physician notification criteria	11.3%	15.1%
Median patient compliance	98.3%	98.8%
Average wear time (days)	11.5	11.3
Median wear time (days)	13.6	13.7
Average age (years)	56.9	65.0
Median age (years)	60.0	69.0

Table 2: Comparison of various wear statistics between local patient population versus aggregate statistics for national data. (AF = atrial fibrillation)

Figure 1: Average Time to First Arrhythmia in Days

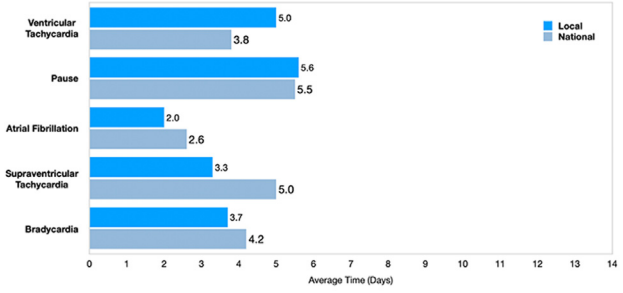

Figure 1: Comparison of average time to first arrhythmia in days between local patient population versus aggregate statistics for national data.

No, authors do not have interests to disclose

261 Shifts in Emergency Department Visits for Lower-Acuity Conditions Among Veterans

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Background: Emergency department (ED) utilization has increased over the last three decades while acuity has decreased, with "non-emergent" conditions accounting for 25-38% of ED visits nationally, and up to 60% within the Veterans Health Administration (VA), the largest healthcare system in the United States. More recently, largely in response to the COVID pandemic, the VA has made a dramatic and unprecedented nationwide shift from in-person patient encounters to telehealth (ie,

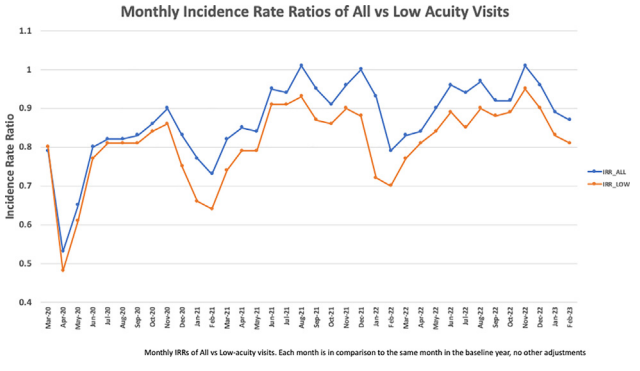
video- and phone-based care), particularly in primary care. The extent to which ED visits for non-emergent conditions have been reduced and replaced by primary care telehealth visits remains unclear.

Study Objectives: In this study, we first examined how patterns of non-emergent ED visits changed during the period of telehealth expansion. Next, we compared the demographic and geographic features of non-emergent ED visits before and after telehealth expansion. Finally, to determine if low-acuity diagnoses which the largest declines in ED visits had an associated rise in telehealth utilization, we described changes in the number of low-acuity primary care encounters conducted in- person, via telephone, and via video in VA primary care during this same period.

Methods: This was a retrospective observational study examining VA ED visits from March 2019-February 2023. We calculated the proportion, type, and counts of non-emergent visits using a novel set of diagnosis codes developed within the VA. Poisson regressions with month-level fixed effects were performed to calculate incidence rate ratios (IRRs) for yearly and monthly counts of all ED visits and non-emergent ED visits, compared to a 2019 baseline. Standardized mean differences were calculated to compare demographic characteristics of non-emergent ED users pre and post-expansion of telehealth, defined as March 2020–July 2020, coinciding with the COVID pandemic. The ten non-emergent diagnoses with highest percent and count reductions in ED visit volumes were identified, and monthly counts of in person and virtual primary care visits for these ten diagnoses were calculated.

Results: Eight million ED visits were analyzed during the study period. On average, non-emergent visits dropped by 17%, corresponding to 16,000 fewer visits per month. The proportion of non-emergent visits dropped from 60.5% to 58%. Non-emergent diagnoses remained similar before and after telehealth expansion, with low back pain, knee pain, and urinary tract infection being the most common. Poisson regressions of non-emergent ED visits demonstrated IRRs of 0.73, 0.83, and 0.86 for years one, two and three following VA telehealth expansion, respectively, compared to a pre-expansion baseline ($p<0.001$). Standardized mean difference analysis showed higher VA service-connected disability rating and lower Elixhauser comorbidity scores among later visits. The largest percentage reductions were seen in ED visits for generalized screening examinations (53%), major depressive disorder (39-47%), gastro-esophageal reflux disease (47%), and gout (45%). The largest count reductions were seen in ED visits for low back pain (~17,000 fewer visits/year), knee & foot pain (~10,000 fewer visits per year), and essential hypertension (~3,750 fewer visits per year). Primary care analysis is ongoing and has demonstrated increases in telehealth visit volumes for all non-emergent diagnoses examined.

Conclusions: Our findings demonstrate substantial reductions in the number and proportion of non-emergent ED visits following the rise in VA virtual care that persist through February 2023. Non-emergent visits declined more than overall visit rates, with a few diagnoses demonstrating large reductions. With ED boarding and wait times rising, understanding changes in ED utilization for lower-acuity care offers an opportunity to improve the value of emergency care and inform health system resource allocation, patient outreach and education, and quality and safety efforts.



No, authors do not have interests to disclose

262 Does TeleTriage Benefit Emergency Departments?

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Study Objective: The use of telemedicine has increased exponentially in recent years, improving access to healthcare for patients with financial, physical, geographical and transportation-related barriers to care. Telemedicine is used in a variety of clinical specialties, ranging from outpatient clinics to tertiary care hospital settings. Previous research indicates that high volume demand and the need for clinical expertise are the two major drivers of the development of telemedicine. Due to the shortage of staffing, among many other factors, patients in the state of Maryland often experience increased emergency department (ED) wait times. To address this problem, EDs have adopted a telemedicine triage (TeleTriage) system, where remote clinicians perform screening exams on patients physically in the ED, to reduce patients' wait time and ED length of stay (LOS). Our study aims to investigate whether TeleTriage expedites patient care compared to the traditional ED care model.

Methods: This is a retrospective, observational analysis of data obtained from the ED at two tertiary care centers of the University of Maryland Medical System. Patients who were treated during the calendar year of 2023 were eligible. The TeleTriage team is staffed via a moonlighting model with either Advanced Practice Practitioners (APP), Emergency Attending Physicians or Emergency Resident Physicians who work from home or in a central telemedicine hub, with a maximum coverage of 14 out of 24 hours per day. Using telemedicine equipment in each triage room, TeleTriage clinicians remotely screen as many patients as possible across multiple EDs with the assistance of the in-person triage nurse at the time of initial patient triage assessment. Patients are semi-randomly selected to be evaluated by TeleTriage clinicians, with selection dependent on multiple factors including patient volume, number of simultaneous triages occurring at any given time, triage nurse evaluation of need for escalation, and TeleTriage clinician availability. TeleTriage clinicians stratify the risk and acuity of each patient, document findings, order tests, and either refer to continue in-person care or discharge patients directly from the waiting room. We compared patients who were evaluated by the TeleTriage team versus those who were evaluated in-person only via the traditional system. Primary outcome was ED LOS, which was dichotomized by its median. As such, prolonged ED LOS was defined as those ED LOS greater than the population median ED LOS. Using the dichotomized outcomes, multivariable logistic regression was performed to assess the association between patients' characteristics and ED LOS.

Results: The study analyzed 86,253 patients, of whom 11,154 (13%) were evaluated via TeleTriage. Mean (+/- SD) age for TeleTriaged patients was 47 (18) compared to 44 (19) years (difference -2, 95% CI -2.8 to -2.0, $P<0.01$) for non-TeleTriaged patients. There were more male TeleTriaged patients (6,169, 55%) than non-TeleTriage patients (36,154, 48%, difference -7%, 95% CI -8% to -6%, $P<0.001$). There was higher percentage of Emergency Severity Index category 3 (Urgent) among TeleTriaged patients (8,450, 76%) versus non-TeleTriaged patients (35,019, 47%, difference -23%, 95% CI -24 to -22%, $P>0.001$). Median (interquartile range [IQR]) for ED LOS of the population was 397 [206-274] minutes. The EDLOS for TeleTriaged group was 555 [329-1031] compared to 375 [191-700, $P<001$)], although the TeleTriaged patients had shorter interval to see clinicians (median 25, IQR 13-59 minutes]), compared to non-TeleTriage patients (median 81 [28-224] minutes, $P<0.001$). Multivariable logistic regression, adjusted for age, gender, race, ESI, date and time of triage, insurance type, confirmed that patients receiving TeleTriage was associated with higher odds for long EDLOS (OR 1.56, 95% CI 1.47-1.66, $P<0.001$).

Conclusion: Patients undergoing TeleTriage in our population were associated with longer stay in the ED, but shorter intervals to see clinicians. Further studies are necessary to confirm or refute our observations, and to investigate underlying causes and resultant outcomes for this observation.

No, authors do not have interests to disclose

263 Tele-Ultrasound Consult Implementation in a Tertiary Care Emergency Department: A Feasibility Study

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Study Objectives: Point-of-Care Ultrasound (POCUS) is widespread in its use and has been shown to be beneficial in expediting and facilitating patient care, but its

adoption can be variable among clinicians. Tele-ultrasound (Tele-US), remote POCUS mentoring, can close this gap in adoption and expertise. In this study, we evaluate the feasibility and effectiveness of implementing a tele-US consult service in a tertiary care emergency department.

Methods: This hybrid type II implementation study was carried out in a tertiary care emergency department with an annual patient census of 120,000. The tele-US consult was carried out using the Butterfly *Tele-guidance* platform. The tele-US implementation was from September 2023-Feb 2024. Ultrasound faculty staffed the tele-US consult on weekdays from 12pm-6pm, the busiest times in the ED. Emergency medicine clinicians consisting of attending physicians, residents and advanced practice practitioners (APPs) had access to the tele-US consult service. After every tele-US consult was completed, clinicians completed a 10-question survey on their experience using the tele-US consult service and how it changed the patients' clinical care. Data were analyzed descriptively.

Results: There were 77 tele-US consults during the pilot study. 54.5% (42/77) of the consults were for patients presenting with shortness of breath and chest pain. 70% (54/77) of the studies were cardiac POCUS followed by lung POCUS at 18.2% (13/77). When asked if the tele-US consult changed clinical care for the patient, clinicians responded that the tele-US consult led to a change in the ordering of imaging in 36.4% (28/77) of patients and a change in medication administration in 24.7% (19/77) of patients, the tele-US consult had no change in clinical management in 20.8% (16/77) of patients. In the cases where the tele-US consult led to a change in ordering of imaging, the tele-US consult led to a cancellation of a comprehensive ultrasound study in 78.6% (22/28) of cases and a cancellation of computed tomography in 17.9% (5/28) of cases. The clinicians estimated that tele-US consult saved the patients' an average of 2.81 hours (SD 5.86), compared to if the patients had waited for a comprehensive or radiology-performed ultrasound study.

Conclusion: Tele-US is feasible in a tertiary care emergency department and led to the change in patient care including a change in medication administration and change in ordering of imaging. Tele-US led to a cancellation of comprehensive ultrasound imaging and a subsequent decrease in ED patient length of stay.

Yes, authors have interests to disclose

Disclosure: GE/Caption Health

Consultant/Advisor GE/Caption Health

264 Changes in Optic Nerve Sheath Diameter Following Rigid Cervical Collar Application in Patients With Traumatic Brain Injury: A Prospective Observational Study in a Tertiary Care Teaching Hospital

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Study Objectives and Background: In previous studies, application of Cervical collar (C- collar) had shown to significantly increase the optic nerve sheath diameter (ONSD) in healthy volunteers with intact cerebral autoregulation. Though in them this effect seems to be of minor importance. If baseline ICP is increased or autoregulation is impaired in a patient with traumatic brain injury (TBI), this mechanism might worsen cerebral blood flow. No studies have been conducted to see this effect of C- collar on ONSD in TBI patients. Therefore, the objective of this study was to determine the magnitude of change in ONSD after application of rigid C- collar in patients with TBI.

Methods: Ours was a prospective observational study where 70 adult patients were enrolled who sustained TBI, presenting to the emergency department. We used a robust exclusion criterion which was designed to decrease the effect of local factors which could affect ONSD in the eye, such as ocular trauma. An average of 2 sonographic measurements, transverse and longitudinal of each eye was recorded in each patient in supine position and the measurements were made at different time frames, ie, at baseline, at 5 minutes and 20 minutes after C-collar application and immediately after C-collar removal. One-way ANOVA was used to compare ONSD at various time points.

Results: There was statistically significant increase in ONSD after application of C-collar at 5 minutes (mean difference; RE- 0.63 mm, LE- 0.64 mm) and 20 minutes (mean difference; RE-0.76 mm, LE-0.75 mm) when compared with the baseline value in patients with TBI and the magnitude of increase is seen to be highest in patients with moderate and severe TBI, who are already at risk of neurological deterioration due to underlying pathology.

Conclusion: We can conclude from our study that there is a significant increase in intracranial pressure following rigid cervical collar application in patients with traumatic brain injury and the magnitude of increase is seen to be highest in patients with moderate and severe TBI, who are already at risk of neurological deterioration due to underlying pathology. This study does not discourage the use of rigid C-collar following trauma, rather it emphasizes the fact that C-collars should be removed at the earliest possible chance. Therefore, all efforts should be directed towards ruling out C-spine injury at the earliest in order to restrict the use of C-collar for minimum duration of time.

Comparison between :	MILD TBI				MODERATE TBI				SEVERE TBI			
	RE		LE		RE		LE		RE		LE	
	MD	*p*-value	MD	*p*-value	MD	*p*-value	MD	*p*-value	MD	*p*-value	MD	*p*-value
C_{12}	-0.57	<0.001	-0.57	<0.001	-0.68	<0.001	-0.72	<0.001	-0.64	<0.001	-0.65	<0.001
C_{13}	-0.62	<0.001	-0.66	<0.001	-0.87	<0.001	-0.83	<0.001	-0.80	<0.001	-0.84	<0.001
C_{14}	-0.28	<0.001	-0.28	<0.001	-0.33	<0.001	-0.31	<0.001	-0.41	<0.001	-0.39	<0.001
C_{23}	-0.05	1.00	-0.08	0.50	-0.19	0.001	-0.11	0.225	-0.16	0.072	-0.18	0.124
C_{24}	0.28	<0.001	0.29	<0.001	0.34	<0.001	0.40	<0.001	0.23	<0.001	0.26	<0.001
C_{34}	0.34	<0.001	0.38	<0.001	0.53	<0.001	0.52	<0.001	0.39	<0.001	0.45	<0.001

Table - Comparison of Mean difference (MD) in ONSD (cases) between various time points in various classes of TBI (1. Baseline, 2. 5 minutes, 3. 20 minutes, 4. After removal)

C_{12} – Comparison of ONSD values at baseline and 5 minutes of application

C_{13}– Comparison of ONSD values at baseline and 20 minutes of application

C_{14}– Comparison of ONSD values at baseline and immediately after removal

C_{23}– Comparison of ONSD values at 5 minutes and 20 minutes of application

C_{24}– Comparison of ONSD values at 5 minutes of application and immediately after removal

C_{34}– Comparison of ONSD values at 20 minutes of application and immediately after removal

No, authors do not have interests to disclose

265 Qualitative Assessment of a Pilot Trauma Training Program for Community Health Responders in Rural Nepal

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Study Objectives: Evidence-based pre-hospital trauma care can improve morbidity and mortality after an injury. In rural Nepal, where there is no systematic pre- hospital trauma care available, community health responders (CHRs) serve as primary pre-hospital providers. A novel two-day pre-hospital trauma training program, adapted from the World Health Organization's Basic Emergency Care Course, was piloted for CHRs in April 2023. This study was a qualitative assessment of the program to better understand the experiences, perspectives, opportunities, and barriers of the training program.

Methods: Three months after the initial trauma training program implementation, semi-structured interviews were conducted with participants. Interview topics included overall feedback on the training program, program administration and training materials, pre-hospital trauma activities by CHRs, and participants' recommendations. Interviews were conducted in Nepali and translated into English. Analysis was conducted using the immersion-crystallization method to identify topical categories and patterns, and to come to final interpretation of the data.

Results: Fourteen participants (out of 35 total trained) were interviewed, representing diverse CHR roles: teachers, ambulance drivers, community health workers, and health post workers. Participating CHRs indicated that the training program had a positive impact on participants' ability to provide patient care in the pre-

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hospital setting, enhanced their knowledge and skills, and instilled confidence in their ability to provide pre-hospital care. Identified barriers included transportation challenges for participants to get to the training site, limited understanding of some medical terminology, and a reliable access of pre-hospital care supplies to conduct the skills they had learned. Participants requested refresher trainings and improvements to the training handbook to ensure ongoing education and skill retention.

Conclusion: This qualitative assessment indicates that the pilot pre-hospital training program for CHRs was well-received and practical among the interview participants in rural Nepal. Ongoing education and enhancements to training materials were deemed necessary to empower diverse community members to be effective first responders and to address the challenges of providing care in resource-constrained settings. The future design of CHR-targeted trauma programs can use the findings of this assessment to iteratively improve upon the proposed programs.

No, authors do not have interests to disclose

266 The Association of Early Brain-Based Biomarker Levels and Clinical Outcomes in Traumatic Brain Injury: A Secondary Analysis of the Prehospital TXA for TBI Trial

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Study Objectives: Blood-based biomarkers of neurologic injury including glial fibrillary acidic protein (GFAP) and ubiquitin C-terminal hydrolase L1 (UCH-L1) are associated with the presence of clinically significant intracranial hemorrhage (ICH) and important early clinical outcomes following traumatic brain injury (TBI). However, the association between biomarker levels drawn within one hour after injury and clinical outcomes are unknown. We sought to characterize the association between GFAP, UCH-L1, and a novel blood-based biomarker, microtubule-associated protein 2 (MAP-2), drawn within one hour of injury with the presence of ICH on initial computed tomography (CT) imaging on hospital presentation (primary outcome) and neurosurgical intervention including craniotomy, craniectomy, or placement of neuromonitoring device performed within 24 hours of injury (secondary composite outcome).

Methods: This is a retrospective analysis of the Prehospital TXA for TBI Trial, a multicenter double-blinded, randomized controlled trial performed across 20 centers and 39 emergency medical systems in the United States and Canada that enrolled patients with suspected TBI with a prehospital GCS score of 3 to 12 and not in shock (SBP $<$ 90 mmHg) with documented injury times within than 2 hours of injury. We included subjects with biomarker levels available within 60 minutes of injury. Patients were analyzed in aggregate regardless of TXA treatment status. Receiver operating characteristic curve (ROC) analyses were conducted for our primary and secondary outcomes and expressed as area under the ROC Curve (AUROC) with 95% confidence intervals (CIs) to identify biomarkers and their combinations with the highest test performance. AUROC points corresponding to the highest sensitivity and specificity were identified and Youden's Index was calculated to identify the point of optimum balance of sensitivity and specificity.

Results: Of 966 patients in the primary trial, 563 had biomarker levels available within 60 minutes of injury and were included in our analyses. Mean age was 41 (SD: 19), 74% male, 97% blunt injury, 97% GCS score 3-12, and median injury severity score 17 (IQR 6-26). There were 316 (56%) subjects with ICH on initial CT, and 95 (17%) underwent neurosurgical intervention. In ROC analysis for presence of ICH on CT, GFAP had an AUROC of 0.89 (95% CI: 0.86-0.92), followed by MAP-2 with 0.76 (95% CI: 0.72-0.80) and UCH-L1 with 0.73 (95% CI: 0.69-0.77), with no combination of biomarkers outperforming GFAP alone. For predicting neurosurgical intervention, GFAP had an AUROC of 0.78 (95% CI: 0.74-0.83), followed by MAP-2 with 0.74 (95% CI: 0.68-0.79) and UCH-L1 with 0.69 (95% CI: 0.64-0.74) with no combination of biomarkers outperforming GFAP alone. Test characteristics are reported in the Table: Test Characteristics for GFAP within 60 minutes.

Conclusion: GFAP, UCH-L1, and MAP-2 levels measured within one hour of injury are associated with clinically relevant outcomes including the presence of ICH and need for early neurosurgical intervention. GFAP demonstrated the strongest test performance across all outcomes. This study supports the clinical value of TBI biomarkers measured within one hour of injury and sets the precedent for future clinical and research endeavors.

	Positive CT for ICH		24h Neurosurgical Procedure	
Sensitivity at 30pg/mL (95% CI)	99%	(97-100)	98%	(92-100)
Specificity at 30pg/mL (95% CI)	36%	(30-42)	20%	(16-24)
PPV at 30pg/mL (95% CI)	67%	(62-71)	22%	(18-26)
NPV at 30pg/mL (95% CI)	96%	(89-99)	98%	(92-100)
Maximum Sensitivity	30pg/mL	-	55pg/mL	-
Optimized Sensitivity-Specificity	110pg/mL	-	500pg/mL	-
Maximized Specificity	2300pg/mL	-	6200pg/mL	-

Table 1: Test Characteristics for GFAP within 60 minutes

No, authors do not have interests to disclose

267 Development of a Machine Learning Model to Predict Alcohol Withdrawal Complications in Trauma Patients

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Study Objectives: Alcohol withdrawal syndrome (AWS) can complicate the management and recovery of trauma patients with positive blood alcohol content (BAC) upon arrival to the emergency department (ED). Nationally, 33-67% of trauma patients report alcohol misuse, and up to 10% of hospitalized patients experience AWS. Early identification of high-risk patients is crucial for optimizing care and improving outcomes. There are very few clinical decision support tools that predict the development of AWS, none of which have been tested or validated in trauma patients. The objective of this study is to develop and validate a machine learning-based tool that predicts AWS complications in trauma patients with positive BAC.

Methods: In this single-center retrospective chart review, we collected records of all adult trauma patients admitted at a large county hospital ED in Queens, New York from January 2015 to December 2022; key data included demographics, vital signs, medical and clinical history, trauma information, hospital course, alcohol withdrawal course and clinical outcomes for each visit. Descriptive univariate analysis was performed. Data was split into 80%/20% for training and testing respectively. The study will employ class balancing methods and test 4 algorithms to predict patients with withdrawal complications–logistic regression (LR), random forest (RF), support vector machine (SVM), and gradient boosting machine (GBM). Model performance will be evaluated using accuracy, sensitivity, specificity, area under the receiver operating characteristic curve (AUC-ROC), precision, and F1-score.

Results: 2,502 trauma patient encounters with positive BAC on arrival were included in the study; median age was 41.6 years; 86.3% were men; 16.6% were non-Hispanic White, 6.6% Black, 4.4% Asian; 46.8% were Hispanic or Latino. 85.1% had blunt force trauma and 14.9% had penetrating trauma. Median BAC was 207.5±126.4 mg/dL, with 79.7% of patients having a BAC level greater than the legal driving limit in the U.S. of 80 mg/dL. 4.4% of patients experienced AWS, with a higher median BAC for AWS patients of 272.7 mg/dL as compared to 201.4 mg/dL for non-AWS patients ($p<0.01$). Hospital length of stay was longer for AWS patients versus non-AWS patients (15.5 vs 8.8 days, respectively; $p<0.01$). Similarly, ICU length of stay was also longer (3.0 vs 1.8 days, respectively; $p<0.05$). Development and evaluation of the machine learning models are still ongoing, but preliminary results indicate that the RF model has the highest test accuracy (0.9067), and sensitivity (0.9706) for prediction.

Conclusions: AWS is prevalent among trauma patients, impacting outcomes. Developing an accurate predictive model for AWS complications in this population is feasible. Early identification using predictive models can facilitate targeted interventions for high-risk individuals, potentially improving patient outcomes and reducing healthcare costs associated with AWS complications. This underscores the importance of integrating data-driven approaches into emergency medicine practice and health policy.

No, authors do not have interests to disclose

268 Identification of Risk Factors for Unstable Cervical Spine Fractures Not Recognized by Validated Clinical Rules

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Study Objective: The objective of this study was to identify clinical risk factors for unstable cervical spine (C-spine) fractures not identified by validated clinical rules. Unstable C-spine fractures can lead to devastating spinal cord injury, with more than

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15 million people living with spinal cord injury worldwide, primarily due to trauma. At this time, no established clinical criteria differentiate the risk of stable versus unstable C-spine fractures. Validated rules like the National Emergency X- radiography Utilization Study (NEXUS) and the Canadian C-spine Rule (CCR) address low risk criteria and dangerous mechanism of injury with regard to C-spine trauma. However, the lack of clinical rules for evaluating stable versus unstable C-spine fractures may lead to inadequate early management of trauma currently considered at low risk for C-spine injuries.

Methods: This was an IRB-approved retrospective chart review conducted at an urban Level 1 Trauma center with an average of 57,000 visits per year. Study patients were identified using the ICD 9 and ICD 10 codes related to C-spine fractures for the period of January 2012 to July 2021. Data were extracted from medical records for sex, age, visit date/time, injury date/time, mode of arrival, mechanism of injury, chief complaint, stability of fracture, presence of neck pain, midline tenderness, or neurologic deficit. Patients were excluded if the fracture was already known or chronic.

Results: 700 pts were analyzed; 232 (33%) had unstable C-spine fractures and 468 (67%) had stable fractures. Univariate analysis indicated that increased odds of unstable fracture were associated with sex, age, neck pain, midline tenderness, and some mechanisms of injury. Females had 42% greater odds of having an unstable fracture compared to men (p=0.04), while prior literature has shown male gender to be a risk factor for C-spine injuries. The odds of sustaining an unstable fracture increased with age, specifically 2% per year after age 20. Those in their 70s (OR 2.32, P=0.05), 80s (OR 4.38, P=0.001) and 90s (OR 2.74, P=0.05) had greater than double the odds of having an unstable fracture when compared to teenagers. Compared to patients with no neck pain complaint, those who did have neck pain had almost double the odds of having an unstable fracture (OR 1.84, p=0.002). Compared to patients who had no complaint of midline tenderness, those who did have tenderness had >50% greater odds of having an unstable fracture (OR 1.52, p=0.04). Using motor vehicle accidents (MVA) with rollover as the reference group, patients who had fallen 10-19 feet had triple the odds of suffering an unstable fracture (OR 3.1, p=0.02) and, surprisingly, those who suffered a ground level fall (GLF) had more than double the odds of having an unstable c-spine fracture (OR 2.79, p=0.001). As expected, increased odds of unstable fracture were observed for diving accidents (OR 1.86), falls from 1-9 ft (OR 2.17), and falls from >20 ft (OR 1.41) but these were not statistically significant, possibly due to the relatively small number of cases. Analysis of mechanism of injury comparing those under 65 years old (n=457) with those 65 and older (n=243) demonstrated that GLF, MVA, and MVA with rollover were among the top 4 most numerous mechanism types for both age groups. In both age groups, a large proportion of unstable fractures were identified in patients whose mechanisms have been considered low risk including GLF, fall from bed, and assault. The proportions of unstable C-spine fractures due to these mechanisms are greater than or equal to proportions observed in the standard high risk categories.

Conclusions: This study demonstrated that some injury mechanisms previously considered low risk can result in unstable C-spine fractures, particularly GLF, fall from bed, and assault. Additional research will further refine the clinical risk factors that may help identify patients most likely to have unstable C-spine fractures.

No, authors do not have interests to disclose

269 An Analysis of Suture Breakdown Over Time: Comparison of Five Different Suture Materials

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Study Objectives: Accounting for roughly 5% of emergency department (ED) visits, laceration repair is one of the most common procedures performed by the emergency physician. Few guidelines currently exist regarding the specific type of sutures to use for common lacerations, and research comparing the longevity of different suture materials is sparse. The purpose of this study is to compare the breakdown rate of different commonly available sutures in the ED.

Methods: Four identical suture kits were obtained and a simple interrupted technique was used to place sutures in the following order by a single physician: 3-0 Ethilon; 4-0 Ethilon; 5-0 Ethilon; 3-0 Chromic Gut; 4-0 Chromic Gut; 5-0 Fast Absorbing Plain Gut; 3-0 Prolene; 4-0 Prolene; 4-0 Vicryl; 5-0 Vicryl; Steri-strips; 4-0 Vicryl (samples 1 and 2) and 3-0 Prolene; 4-0 Prolene; 3-0 Chromic Gut; 4-0 Chromic Gut; 5-0 Fast Absorbing Plain Gut; 3-0 Ethilon; 4-0 Ethilon; 5-0 Ethilon; 4-0 Vicryl; 5-0 Vicryl; 5-0 Vicryl (samples 3 and 4). Two of each suture type were used in addition to three additional 4-0 Vicryl and 5-0 vicryl sutures for a total of 126 sutures. The kits were placed in regularly used work bags for exposure to daily stressors, and pictures were taken twice weekly to document suture breakdown. Statistical analysis was performed used Chi-squared testing for categorical variables with an alpha level of 0.05.

Results: A total of 6 weeks of data was collected. A detailed description of the breakdown corresponding to each suture size and material can be seen in the Table. Breakdown was seen in 24 (19.0%) of the sutures. The suture material with the highest breakdown rate was Fast Absorbing Plain Gut (33.3%) while that with the lowest breakdown rate was Ethilon (5.6%). The percentage of Ethilon sutures that broke down during this study period was significantly less than the breakdown rate of all other sutures combined (5.6% vs 24.4%, p=.014717). With respect to the different samples, the only breakdown noted was a single 5-0 Fast Absorbing Plain Gut suture at Day 39 in sample 3. Vicryl was noted to breakdown in all of the other three samples, with breakdown being recorded as early as Day 5 in one case (sample 1). Prolene and Ethilon were only noted to breakdown in one of the four samples.

Conclusion: Prolene, Ethilon, Chromic Gut and Fast Absorbing Plain Gut all maintained structural integrity for at least 14 days in this study. Any of these suture materials therefore appear adequate for the common ED laceration repair as sutures are generally removed within this timeframe. Based on this limited data, Ethilon had a statistically lower breakdown rate than the other sutures over the course of 6 weeks.

Suture Type	Day Breakdown was first noted
3-0 Ethilon	-
4-0 Ethilon	-
5-0 Ethilon	Day 14; Day 42
3-0 Chromic Gut	Day 23 (x2)
4-0 Chromic Gut	Day 35; Day 39
5-0 Fast Absorbing Plain Gut	Day 31 (x2); Day 37; Day 39
3-0 Prolene	Day 14
4-0 Prolene	Day 35; Day 42
4-0 Vicryl	Day 36; Day 39
5-0 Vicryl	Day 5; Day 39
Steri-strips	Day 2; Day 4; Day 5 Day 6 (x2); Day 7
4-0 Vicryl (single stitch)	Day 8
5-0 Vicryl (single stitch)	-

Table 1: Description of time to breakdown for each suture type

No, authors do not have interests to disclose

270 Diagnostic Accuracy of Ocular Pathology by Emergency Physicians Comparing Ocular Ultrasound and Digital Fundoscopic Imaging

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Study Objectives: Ocular complaints comprise ~2% of all emergency department (ED) visits. Emergency physicians (EP) must rapidly diagnose and differentiate ocular pathologies to prevent significant morbidity, including permanent vision loss. Although all physicians are trained in direct fundoscopy, studies show that EPs lack confidence in these skills and interpretations. Point-of-care ultrasound has demonstrated efficiency and accuracy in evaluating ocular emergencies, including retinal detachment (RD). Additionally, newer technologies such as digital retinal imaging (DRI) are becoming more common in EDs for diagnosing ocular complaints. EPs' comfort, familiarity, and accuracy with these technologies are unclear, and the optimal method for diagnosing retinal pathology in the ED is still under debate. The aim of this study was to compare EP accuracy in interpreting DRI and ocular ultrasound (OcUS) of both normal and pathological conditions. Additionally, the study examined if level of training had any effect on the accuracy of interpretation across these modalities.

Methods: This was an observational survey study out of a suburban community teaching hospital with an emergency medicine residency. Twelve OcUS clips were selected from an ultrasound database by Advanced Emergency Medicine Ultrasound fellowship-trained EPs, representing 5 core retinal pathologies: central retinal artery occlusion (CRAO), RD, vitreous detachment, vitreous hemorrhage, and papilledema. In addition, twelve DRI of similar pathologies, sourced from various databases were also selected. Normal findings of both OcUS and DRI were included. Duplicate images and clips were selected to reduce errors. The images and clips, along with

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corresponding clinical vignettes, were compiled into a 24-question survey. The survey was sent via email to 93 attending and 18 resident emergency physicians. Data analysis was conducted using paired Student's t-test and chi-squared test. Institutional review board approval was obtained for this study.

Results: A total of 54 combined residents and physicians from various post-graduate year (PGY) levels, ranging from PGY1 - PGY16+, participated in the survey. Two entries were excluded due to incomplete surveys, resulting in 52 completed surveys for analysis. Overall, the accuracy in diagnosing ocular pathology was significantly higher with OcUS (65.5%), compared to DRI (45.2%), p=0.029. EPs demonstrated higher accuracy in recognizing OcUS findings in all categories except for CRAO (DRI 62.5% vs OcUS 39.4%) and papilledema (DRI 68.3% vs OcUS 57.7%). Accuracy with OcUS was superior to DRI interpretation across all PGY levels. PGY 1-3 showed higher OcUS accuracy (69.2%) compared to PGY5+ (59%). PGY 5+ scored higher with DRI (46.5%) compared to PGY1-3 (39.6%).

Conclusion: This study demonstrates that EPs have a higher overall accuracy in diagnosing ocular pathologies using OcUS compared to DRI. These findings suggest that a combined approach to ocular diagnostics may be beneficial, with a focus on enhancing EPs' skills in both OcUS and DRI. Further research is needed to determine the optimal balance between these modalities and to explore targeted educational strategies to improve diagnostic accuracy for specific pathologies.

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271 Transesophageal Echocardiography in the Emergency Department: Development of a Validated Checklist for Training

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Study Objectives: Although the use of transesophageal echocardiography (TEE) may improve cardiac arrest management, Emergency Physicians (EPs) may have insufficient clinical practice opportunities to become competent in TEE. Standardized checklists, such as those used in simulation-based mastery learning (SBML), improve trainee performance for rarely performed procedures, including other point-of-care (POC) ultrasound procedures. To date, there is no validated checklist for performing POC TEE in the emergency department setting. The objective of this project was to develop and validate an SBML checklist containing the critical actions for performing POC TEE that can be used for procedural skills training.

Methods: This was a modified Delphi study and pretest-posttest study. Checklist development occurred sequentially as follows: 1) preliminary checklist construction based on literature review, 2) a modified Delphi process using a panel of 12 national TEE experts to revise the checklist until reaching consensus, and 3) determination of a minimum passing standard (MPS) using Mastery Angoff and patient safety techniques. We then measured aspects of validity by piloting the checklist as part of an SBML program. Inter-rater reliability was calculated using a Fleiss' Kappa coefficient. After training 13 EPs with the checklist, descriptive statistics were used to assess their performance using the checklist. A previously validated survey was used to assess pre- and post-training confidence in using TEE in a clinical setting on a 100-point scale. The Wilcoxon signed-rank test was used to compare the pre- and post-training confidence for all trainees, and Wilcoxon-Mann-Whitney test was used to compare the confidence in using TEE after training between 9 EP trainees who had prior TEE experience and 4 trainees who had no prior TEE experience.

Results: The final checklist consisted of 43 items after 3 Delphi rounds. The MPS was set at 83% and the panel deemed 4 actions as critical to patient safety. There was almost perfect inter-rater agreement with a Kappa coefficient of 0.96 (95% CI 0.91-1.0). All EPs that participated in training met the MPS, with a mean score of 96.9% (95% CI 94.8-99.1). Mean confidence using TEE improved after SBML (27.7 to 82.1, p<0.0001). For trainees who had prior TEE experience, their mean post-training confidence was higher compared to trainees without prior TEE experience (84.9 vs 75.8), but this was not statistically significant (p=0.45).

Conclusions: We developed and demonstrated validity evidence for a 43-item checklist to use as part of SBML for TEE. The inter-rater reliability of the checklist is excellent. EPs had significant improvement in their confidence to use TEE in clinical practice after training with the checklist, and their post-training confidence was not differentiated by prior TEE experience.

No, authors do not have interests to disclose

272 The Use of Point-of-Care-Ultrasound in Evaluating for Colitis and Diverticulitis in the Emergency Department

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Background: Acute diverticulitis and colitis are common diagnoses made in the emergency department (ED). Several small studies have demonstrated the utility of point-of-care ultrasound (POCUS) in evaluating bowel pathology; however, large prospective studies are lacking. We performed a prospective study to evaluate the use of POCUS in evaluating patients with concern for diverticulitis and/or colitis in the ED. The purpose of this study was to determine the accuracy, sensitivity, and specificity of POCUS in diagnosing diverticulitis, complicated diverticulitis, and colitis in ED patients presenting with abdominal pain.

Methods: We conducted a prospective observational study of patients with suspected diverticulitis or colitis in an academic ED. Patients were enrolled if there was clinical suspicion for either diverticulitis or colitis and a Computed Tomography (CT) scan was ordered. The CT scan served as the gold standard diagnostic test. POCUS of the bowel was performed using a curvilinear transducer. Sonographic signs of diverticulitis included all of the following: presence of sonographic point tenderness, bowel wall edema greater than 0.5cm, enhancement of the pericolonic fat, and presence of diverticulum. Sonographic signs of complicated diverticulitis included the presence of any one of the following findings: intraperitoneal free fluid, 2 or more areas of bowel wall edema in different abdominal quadrants, free air, presence of an abscess, or dilated loops of bowel greater than 2.5cm. Patients with any one of the above findings with sonographic signs of diverticulitis were considered complicated. Colitis was diagnosed based on the presence of bowel wall edema, enhancement of pericolonic fat, and sonographic tenderness to palpation. Test characteristics of POCUS in identifying diverticulitis, complicated diverticulitis, as well as colitis, as compared with CT findings, were calculated along with 95% confidence intervals (CIs).

Results: A total of 787 patients were enrolled. Using CT, 319 patients were diagnosed with diverticulitis (with 85 patients found to have complicated diverticulitis); 76 patients were diagnosed with colitis. The sensitivity of POCUS for diagnosing diverticulitis was 0.94 (95% CI: 0.91-0.96) and specificity was 0.93 (95% CI: 0.90- 0.95). The sensitivity of POCUS for complicated diverticulitis was 0.91 (95% CI: 0.84-0.97) and specificity was 0.91 (95% CI: 0.89-0.93) with a negative predictive value of 0.99 (95% CI: 0.98-0.99). The sensitivity and specificity of POCUS for diagnosing colitis was 0.72 (95% CI: 0.62-0.82) and 0.97 (95% CI: 0.96-0.98), respectively. The accuracy of POCUS for diverticulitis, complicated diverticulitis, and colitis was 0.93 (95% CI: 0.91-0.95), 0.91 (95% CI: 0.88-0.93), and 0.95 (95% CI: 0.93-0.96), respectively.

Conclusion: The use of POCUS for evaluating bowel pathology is expanding in emergency medicine. Our study shows that POCUS has high accuracy in diagnosing both diverticulitis and colitis. This suggests that POCUS should be considered as the first line imaging modality in this patient cohort. Specifically for cases of complicated diverticulitis, a NPV of .99 may suggest that CT imaging is not required in this patient cohort. Further studies are needed to determine whether a screening tool combining POCUS findings with individual patient factors can be used to determine which patients with suspected inflammatory bowel disease do not require CT scans in the ED.

No, authors do not have interests to disclose

273 Artificial Intelligence to Detect Spinal Fluid and Spinal Cord on Ultrasound

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Background: Lumbar puncture (LP) is a critical diagnostic test in febrile infants that is associated with high failure rates, especially among novice providers. Ultrasound guidance can improve LP success but is underutilized due to lack of provider comfort and expertise in this skill. Automated identification of optimal interspaces on ultrasound has the potential to improve procedural success. Our aim was to develop an artificial intelligence (AI) algorithm using a database of ultrasound spinal anatomy videos to identify key anatomic structures and aid in infant LP performance.

Methods: 13 unique patient ultrasound videos were included contributing 3,390 total frames to model development and testing. Frames were annotated with binary

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classification for presence of key anatomical features including spinal cord and spinal fluid and determining whether the image is bad or good quality. We treated the problem as a multilabel classification task at the frame level. Data were augmented to increase dataset to 11,224 frames and to balance classes between training and testing sets. Image processing techniques were used to enhance image features for model learning. Deep learning architecture employed including ResNet18, ResNet34, AlexNet, VGG16 and DenseNet, with hyperparameter tuning for optimal performance (learning rate, epochs, loss function, optimizer). We evaluated test characteristics of all models to identify individual features. F1 score was computed to assess for optimal balance between true positives, false positives, and false negatives.

Results: The ResNet18 model performed best with an average f1 score of 0.98 for all three feature classifications. DenseNet121 had highest accuracy, but ResNet18 was chosen as the superior model due to fewer critical errors (0 false positives for fluid and 3 false negatives for cord), expert validation (priorities: reducing false positives for fluid and false negatives for cord) and optimizing cord detection (sensitivity for cord = 0.97 despite feature prevalence of 20%)

Conclusion: The model successfully identified images with spinal fluid, spinal cord, and of poor quality with high accuracy using ResNet architecture. Future work will expand the dataset, label feature pixels for localization, and test real-time deployment.

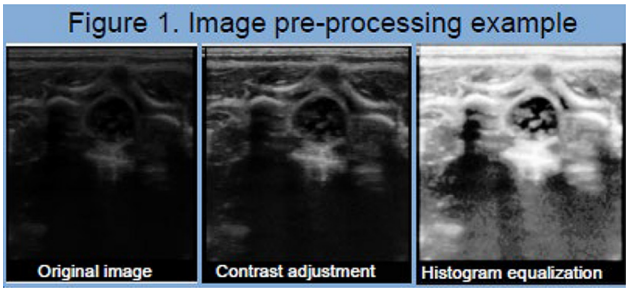
Table 1. Model performance

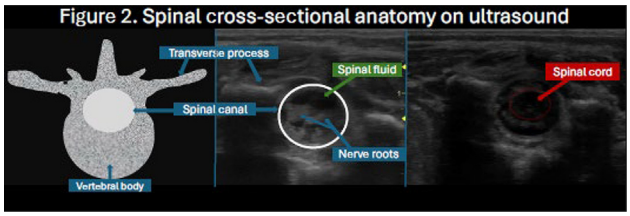
Metrics	AlexNet	VGG16	ResNet18	ResNet34	DenseNet121
Accuracy	0.9784	0.9798	0.9882	0.9843	0.9897
Precision	0.9775	0.9720	0.9852	0.9836	0.9863
Recall	0.9647	0.9733	0.9825	0.9730	0.9849
F1-score	0.9710	0.9726	0.9838	0.9783	0.9856
TN	1253	1264	1280	1282	1294
FP	17	21	11	12	10
FN	27	20	13	20	11
TP	737	729	730	720	719
FP (Cord)	2	8	0	1	2
FN (Cord)	14	1	3	5	2
FP (Fluid)	5	13	0	6	7
FN (Fluid)	9	2	10	11	4
FP (Quality)	10	0	11	5	1
FN (Quality)	4	17	0	4	5
Misclassified images No.	26	23	11	23	12

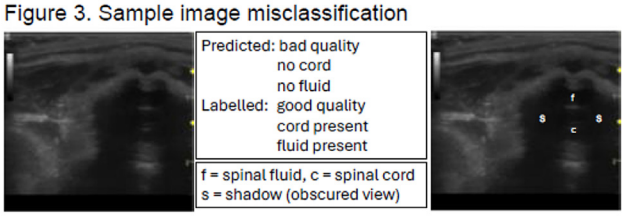
Table 2. Confusion matrix with test characteristics for model predictions of quality, spinal cord, and spinal fluid

	Quality present	Quality absent	Fluid present	Fluid absent	Cord present	Cord absent
Feature predicted	112	11	488	0	130	0
Feature absent	0	555	10	180	3	545

	Sensitivity (95% CI)	Specificity (95% CI)	Positive predictive value (95% CI)	Negative predictive value (95% CI)	F1 score
Quality	100% (96.76% to 100%)	98.06% (96.55% to 99.03%)	91.06% (85.01% to 94.81%)	100% (99.34% to 100%)	0.9532
Fluid	97.99% (96.34% to 99.03%)	100% (97.97% to 100%)	100% (99.25% to 100%)	94.74% (90.69% to 97.08%)	0.9899
Cord	97.4% (93.55% to 99.53%)	100% (99.33% to 100%)	100% (97.20% to 100%)	99.45% (98.34% to 99.82%)	0.9886







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274 Association of Dilated Aortic Root on Point-of-Care Ultrasound With Aortic Aneurysm and Dissection

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Study Objectives: Thoracic aortic dissection (TAD) is a life-threatening condition with the mortality rate of 1-2% per hour, highlighting the significance of prompt diagnosis. Thoracic aortic aneurysm (TAA) is associated with TAD and can be detected by point-of-care ultrasound (POCUS). We sought to evaluate the diagnostic accuracy of POCUS in detecting TAA and the prevalence of TAD in patients with TAA by POCUS.

Methods: Patients with aortic root measurement of 4.5cm or greater on transthoracic cardiac POCUS between 2013 and 2023 who received either chest Computed Tomography (CT) or cardiology echocardiogram (c-echo) were retrospectively selected by querying a POCUS database (QpathE) from three emergency departments in our system. Comprehensive demographic, clinical, and imaging data were retrieved from electronic medical records. For both CT and c-echo an aortic measurement ≥4cm was considered aneurysmal, using the largest reported measurement. If both CT and c-echo were performed the largest CT measure was used. Statistical analysis was performed using IBM SPSS version 29.

Results: Our final cohort included 219 patients with TAA (≥4.5 cm) on POCUS, with the median age of 69 years (IQR [58,80]) of which 178 (81.3%) were male. 166 (75.7%) had CT performed and 53 (24.3%) had a c-echo without CT. There was a significant positive correlation between POCUS measurements with those of CT and c-echo ($r=0.51$, $p<0.001$). Comparing the measurements on POCUS with those derived from our ground truths, the mean difference for the Bland-Altman plot was 0.32 cm (95% confidence interval; -0.91 to 1.55), with the average POCUS measure being slightly higher. TAA was present in 197 (89.95%) with the reported TAD in 29 of them (14.7%). Overall, the positive predictive value (PPV) of POCUS for TAA was 89.95% (95% CI, 86%-93.8%).

Conclusion: Although POCUS measurement tended to be slightly higher than that of CT or c-echo on average, it demonstrated a high accuracy and predictive value for TAA. More than one in ten patients with TAA on POCUS had TAD. Our results underscore the efficacy of POCUS for the prompt detection of thoracic aortic aneurysm and dissection.

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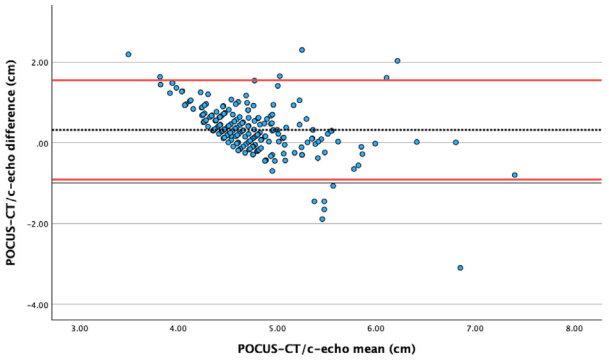

Figure1. Bland-Altman Plot. Mean difference (dashed line) and 95% limits of agreement (red lines)

No, authors do not have interests to disclose

275 To Do or Not to Do? Qualitative Methods for Ultrasound-Guided Subclavian in the Emergency Department

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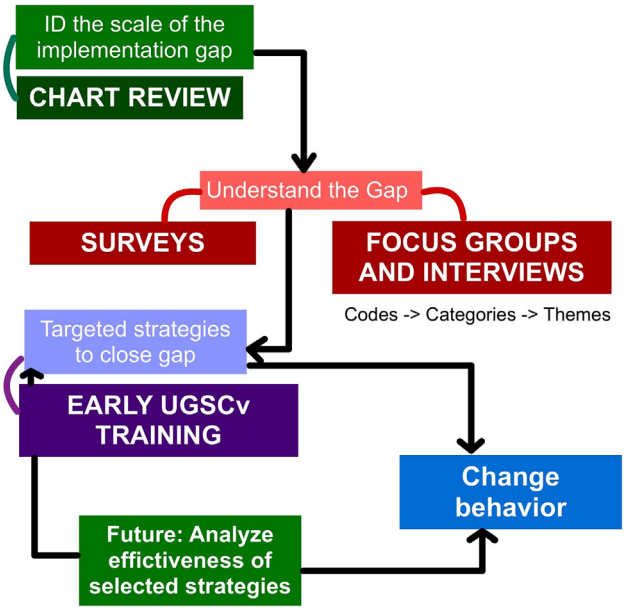
Study Objectives: Ultrasound guided subclavian vein cannulation (UGSCv) for central venous catheter (CVC) placement demonstrates patient safety benefits including reduced infection risk and decreased complication rates when compared to cannulation of the internal jugular and femoral veins. Despite these benefits, emergency physicians (EPs) do not preferentially select UGSCv during CVC placement. The purpose of this study was to quantify provider behaviors regarding subclavian vein cannulation and conduct qualitative interviews to develop deep understanding of current practice to aid in the selection of implementation strategies to increase adoption of UGSCv among EPs.

Methods: To identify and quantify clinician practice patterns we performed chart review of CVC site selection from the same 6 months in 2013 and 2023. With confirmation that EPs underutilized UGSCv, we conducted focus groups and interviews with EP faculty and residents at a single, large academic medical center to investigate current attitudes, knowledge, and perspectives on UGSCv. We previously performed a quantitative, electronic survey that identified factors that facilitated UGSCv (eg, Fewer complications, higher success rate) or were barriers to performing UGSCv (eg, Lack of comfort, no training/education). To develop our interview questions, we used our data on barriers and facilitators in an Implementation Science framework called the Consolidated Framework for Implementation Research (CFIR) allowing us to effectively guide our discussions for deeper, contextual understanding. Then, we conducted qualitative content analysis of the focus group transcripts (NVivo software) to characterize those barriers and facilitators and to identify major themes for use in the development of strategies to increase adoption of UGSCV.

Results: We reviewed charts from January to June in 2013 and 2023 looking at the number and site selected for CVC cannulation. In 2013, SCV represented 11% of the total number of CVC placed and 16% in 2023. In our qualitative analysis, we identified 64 distinct codes or concepts after reaching saturation from 5 interviews and 3 focus groups with a mix of 12 EPs (attending physicians and residents). Using concept mapping, we grouped those codes into 6 general categories to develop comprehensive understanding of the barriers against UGSCv and develop an implementation plan. These categories included *environmental factors* (eg, access to supervision, ingrained practice patterns), *physical factors* (eg, time required to supervise and perform UGSCv, physical constraints and ergonomics), *awareness* (eg, access to UGSCv learning, prior training experiences, no current standard in training, lack of opportunities for skill development), *psychological safety* (eg, fear of judgement, time outweighing educational opportunities), *motivation* (eg, ease of the alternative, personal expertise development, resident support and education), and early intervention strategies against inertia (eg, resident interest in UGSCv, early training, simulation based learning, faculty support for resident education). Our work shows that there is a major opportunity to target our interventions early in resident education to improve resident awareness, self-efficacy to perform UGSCv, and motivation of staff to train or supervise them.

Conclusion: Our qualitative analysis confirms the barriers and facilitators we identified previously and gives us a deeper understanding of why those barriers and facilitators exist in our ED. This knowledge will guide the development of evidence-based, targeted strategies to increase the adoption of UGSCv creating more versatile EPs. Specifically, this data sheds light that earlier exposure and training of UGSCv for junior resident physician learners, even before learning the traditional internal jugular approach, should mitigate barriers against widespread adoption of UGSCv in our ED.



No, authors do not have interests to disclose

277 Impact of Initiating a Stroke "Launch Pad" on Timeliness of Thrombolytic Therapy

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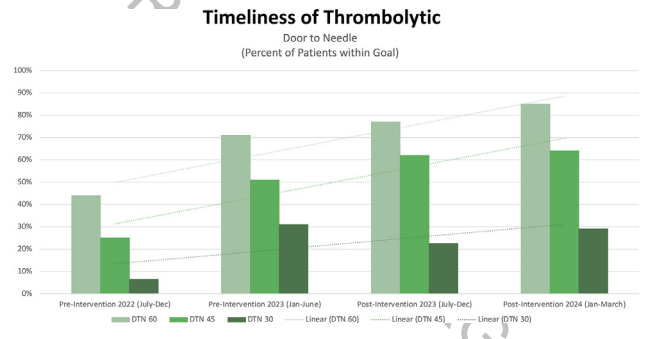
Study Objective: To evaluate the impact of implementing a "launch pad" system within the emergency department (ED) of a large comprehensive stroke center on the time from ED arrival to administration of thrombolytics.

Methods: *Setting.* A large Southeastern Academic Medical Center with a 70 bed ED and a comprehensive stroke center. *Participants.* The study included all code stroke patients presenting to the ED within 24 hours of time last known well. *Design.* A quality improvement (QI) design was used to evaluate the impact of implementing a "launch pad" process. At baseline, code stroke patients were taken to any acute ED bed available. The patient would be assessed by the stroke neurology team simultaneously while IV access was being initiated, blood work was being sent and our protocolized "code stroke" order set was being initiated. After the neurology evaluation the patient would be taken to the CT suite. The launch pad intervention included a pre-defined bed with a scale in a space adjacent to the CT suite for the initial evaluations of all potential stroke cases and emphasized a standardized process prior to CT including determination of blood glucose, inclusion/exclusion criteria for thrombolysis, initiation of treatment for blood pressure > 185/110, obtaining weight, ensuring iv access, and performing the national institute of health stroke scale. A goal was to enable administration of thrombolytics immediately following the noncontrast CT scan. We examined a 12 month period prior to initiation of the intervention and then the 9 month period post intervention to identify changes in the care metrics continuously tracked as part of the QI program of the stroke center, including the percentage of patients treated in compliance with door-to-needle time (DTN) within 30, 45 and 60 minutes.

Results: For the 12 month period prior to the initiation of the launch pad (July 2022 – June 2023) there were 1095 "code stroke" activations from our ED. In the 9 months (July 2023 – March 2024) after initiating the launch pad there were 926

"code stroke" activations. Average door to needle time (timeliness of thrombolysis) is trended and shown in figure 1. Percentages of patients meeting the 30 minute, 45 minute and 60 minute benchmarks demonstrated an improvement in all measured variables.

Conclusions: Implementation of a stroke launch pad in our emergency department has demonstrated significant improvements in the proportion of patients meeting critical time benchmarks, including those aimed at administering thrombolytics within 30, 45, and 60 minutes. We suspect that the success of the stroke launch pad is due to a centralized location and dedicated resources that facilitates rapid assessment and initiation of stroke protocols upon patient arrival and a standardized and coordinated evaluation by multidisciplinary teams within the launch pad that streamlines communication and decision-making processes, reducing delays in care delivery.



No, authors do not have interests to disclose

278 Unveiling Gaps: A Comprehensive, Equity-Driven Examination of Emergency Department Discharge Workflows

Jiang L, Sanapala S, Steel P/NY-Presbyterian, Weill Cornell Medical Center, New York, New York, US

Study Objective: From a patient perspective, discharge can represent the end of an exhausting unanticipated healthcare encounter. Prior work has shown that emergency department (ED) discharge content is often incomplete and poorly comprehended and non-adherence to the post-ED discharge plan can lead to adverse events. A pilot study at Weill Cornell Medical Center identified less than 50% of key discharge content conveyed to patients during ED discharge – mirroring results found in peer-reviewed publication. Recognizing that closing the ED encounter is a multistep process through several modalities and often by more than one care team member, we sought to expand on this study by observing all ED discharge interactions and modalities to produce a more rigorous understanding of the content and communication gaps currently present.

Methods: We conducted a prospective observational study at two New York City EDs. Patients were selected for observation based on demographic characteristics to ensure diverse representation. Research Assistants (RAs) observed the entirety of the patient's ED course from initial evaluation to discharge, documenting all discharge-related discussions from all provider types. RAs recorded demographic information, ED environment details, length of discharge conversations and turbulence in discharge flow. RAs also documented both verbal and written discharge content compared to a "gold-standard" checklist developed from national guidelines.

Results: Between September 2023 to March 2024, 175 patient interactions were observed. Over half (58.3%) of patients were English speaking followed by 17.7% Spanish, 10.9% Cantonese or Mandarin, and 13.1% Other. Average total time of discharge discussion was 2 minutes and 46 seconds. Most interactions did not have any interruptions, with an average of 0.1 interruptions (min 0, max 2) per discharge, lasting an average of 14 seconds. During verbal discharge discussions, the vast majority included discussion of ED diagnosis (87%), ED evaluation results (87%), medications (81%) and follow-up plan (78%). Only half (54%) discussed ED return precautions. However, assessment of comprehension occurred during only 53% of discharges with 46% of patients having the opportunity to ask follow-up questions. Written discharge content mirrored these results except for decreased inclusion of ED evaluation results (69%) as well as improved discussion of ED return precautions (86%). While 91% of verbal discharge occurred in patients' preferred language, only 61.5% of patients were explicitly asked language preferences and written discharge instructions were often (55%) not in their primary language.

Conclusion: Results show the importance of both written and verbal discharge processes to ensure delivery of all important discharge content to patients. While most key content was provided, it is clear there is a deficit in ensuring patients understand their post-ED plan and can ask clarifying questions. To enhance patient comprehension, we need to ask about their preferred language and consistently use translation services when needed. To our knowledge, this study represents one of the most comprehensive examinations of potential gaps in current ED discharge processes, inclusive of vulnerable populations often excluded in other studies. While prior work has focused on a single aspect, such as written content or verbal communication, ED discharge rarely occurs with one provider, through one modality, during a single interaction. This necessitates a comprehensive examination of all components and touch points of this multi-faceted process and the important interplay between these factors to enhance patients' discharge comprehension and outcomes.

Yes, authors have interests to disclose

Disclosure: MCIC Vermont

Grant Support MCIC Vermont

279 Association of Increased Advanced Imaging Utilization With the Deployment of a Provider in Triage Model

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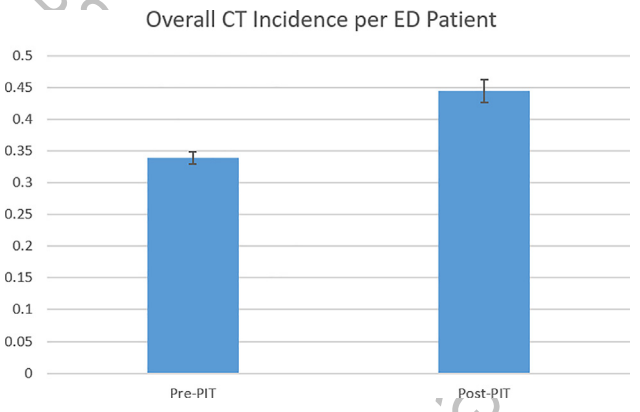
Study Objectives: Provider in triage (PIT) models are increasingly common across emergency department (ED) settings in the United States. These initiatives have demonstrated an ability to reduce door to provider times and improve left without being seen rates. However, the model could also have the potential to increase utilization of diagnostic imaging, as the PIT provider may reduce the threshold for ordering testing due to the abbreviated nature of the patient evaluation. At our institution, a PIT model was implemented in July 2023. The objective of the current study was to assess for change in overall advanced imaging utilization following the deployment of the PIT model.

Methods: This was a retrospective study at a single academic ED encompassing a time period from July 2021 to October 2023. The incidence rate of advanced imaging that occurred for adult ED patients (age 18 or greater) was assessed. This included computed tomography (CT), magnetic resonance imaging (MRI), radiology ultrasound (RUS), and point-of-care ultrasound (POCUS) studies. The PIT physician model was trialed in May and June 2023, with full implementation starting in July 2023. We compared three pre-PIT four month time periods (7/1/21-10/31/21, 7/1/22-10/31/22, and 1/1/23-4/30/23) to the post-PIT time period of 7/1/23-10/31/23. Two separate investigators retrieved data on imaging utilization from the Carestream Picture Archiving and Communication Software (PACS) program via a standardized data abstraction form. The number of patient visits per four month period along with distribution of emergency severity index (ESI) scores were also abstracted. Incidence of advanced imaging was compared between the pre-PIT and post-PIT cohorts via the chi-squared test. One hundred CT pulmonary angiogram (CTPA) studies were randomly selected from each cohort and assessed for the presence or absence of acute pulmonary embolism.

Results: There were 56,842 adult ED visits in the pre-PIT period and 20,615 in the post-PIT period. The average ESI level was 2.81 in the pre-PIT period and 2.89 in the post-PIT period. There was no difference in the proportion of patients assigned ESI level 1, 3, and 5. There was a slightly higher percentage of patients assigned ESI level 2 in the pre-PIT cohort, 30.7% as compared to 27.8%, $p<0.0001$. Conversely, the pre-PIT cohort had a lower percentage of patients given ESI level 4, 12.6% compared to 16.7%, $p<0.0001$. Incidence of overall CT utilization per ED patient increased from 0.39 (95% CI 0.37-0.34) to 0.45 (95% CI 0.44-0.46), $p<0.0001$. CT Abdomen/Pelvis increased from 0.086 (95% CI 0.083-0.088) pre-PIT to 0.111 (95% CI 0.107-0.116) post-PIT, $p<0.0001$. CTPA incidence increased from 0.014 (95% CI 0.013-0.015) to 0.025 (95% CI 0.023-0.027), $p<0.0001$. CT Head incidence increased from 0.094 (95% CI 0.091-0.096) to 0.11 (95% CI 0.10-0.11). MRI utilization increased, with an incidence of 0.037 (95% CI 0.035-0.038) pre-PIT and 0.042 (95% CI 0.039-0.045) post-PIT, $p=0.001$. Incidence of RUS and POCUS were not significantly different between the groups. The CTPA positivity rate within the 200

randomly selected patients was 9% (95% CI 4.1%-17%) in the pre-PIT cohort and 7% (95% CI 2.8%-14%) in the post-PIT cohort, p=0.62.

Conclusions: In our single center retrospective study, the initiation of the provider in triage model was associated with significantly increased utilization of CT and MRI. ESI levels suggested a slightly higher severity of illness in the pre-PIT cohort, while the CTPA positivity rate did not differ between the cohorts. Given the retrospective nature of the present study, it is unclear if the PIT model is responsible for the demonstrated increase in imaging utilization. Further study is needed to assess for additional confounding variables that may impact the incidence of imaging during this first period of PIT implementation.



No, authors do not have interests to disclose

280 'What Are We Waiting For?' Conflicting Perspectives on the Emergency Department Boarding Crisis: A Qualitative Analysis of Interviews With Patients, Frontline Providers and Hospital Leaders

Cumbermack M, Reich D, Lynch M, Patel S, Sharma R, Daniels B/Weill Cornell Medicine, New York, New York, US

Study Objectives: Boarding admitted patients in the emergency department (ED) continues nationwide at crisis levels. Numerous studies link boarding to increased medical errors, longer inpatient stays, and increased morbidity and mortality. However, few studies qualitatively describe ED boarding. We aimed to compare the experience of ED boarding from the perspectives of patients, providers, and hospital leadership.

Methods: This cross-sectional study was conducted in July 2023. A convenience sample of admitted patients physically located in the ED and waiting ≥10 hours for an inpatient bed was included. ED staff and leadership were identified via snowball sampling. Staff included attending and resident physicians, physician assistants (PAs), nurse practitioners (NPs), and registered nurses (RNs). Hospital leadership included ED and hospital personnel with direct involvement in operations. Structured interview guides explored five domains: communication, medical care, comfort, long-term impact, and innovation. Interviews were electronically transcribed and de-identified. Four coders independently reviewed transcripts using directed content analysis until thematic saturation was reached.

Results: We conducted 55 interviews: 15 patients boarding in the ED, 6 members of hospital operations / leadership, 12 attending physicians, 6 resident physicians, 12 PAs, 2 NPs, and 2 RNs at a single, urban, academic ED. Thematic analysis (**Figure**) revealed all groups desired improved patient-provider communication: patients expressed frustration over ambiguous wait times for beds and lack of clarity regarding changes in care team (eg, ED vs inpatient providers). ED providers consistently felt boarding negatively affected patient safety and medical care; a theme not routinely expressed by patients though patients frequently noted the disruptive environment and difficulty getting medications when needed. Patients and providers agreed comfort measures (TVs, reading materials, sleep masks, ear plugs) could improve the boarding experience. Many patients indicated cleanliness (especially bathrooms) and lack of access to food negatively impacted their experience. Providers stressed boarding decreases staff morale, increases burnout, and would benefit from regular communication from hospital leadership regarding measures taken to address boarding. Leadership emphasized the negative impacts of ED boarding on clinical outcomes, patient satisfaction and financial/reputational while identifying increased discharges before noon and optimized patient flow as possible solutions.

Conclusions: Patients, providers, and leadership uniformly acknowledge the negative impacts of ED boarding on the patient experience. However, perspectives on the relative importance of these various impacts (ie, worse clinical care versus comfort), perceptions of efforts to reduce ED boarding (ie, acknowledgement by leadership versus actions taken) and solutions best suited to mitigate the negative impacts of ED boarding (improved communication versus hospital-level operational changes) differed meaningfully between these key stakeholder groups. Efforts to reduce ED boarding should address not only hospital-level operational improvements to patient flow, but also local improvements to better the patient experience and combat moral injury among frontline providers.

Figure 1: Comparison of patient, frontline provider and hospital leadership perspectives on the ED boarding crisis

Emergent Themes by Domain	Patients	Frontline Staff	Hospital Operations
Communication	• Long wait times, no regular updates, and conflicting information by providers • Unclear for patients who their care team is and what it means to be admitted • Clear communication is a priority	"[One doctor said], 'we don't have that on file so you can't take that' and then another said, 'screw what she said, take your meds.' **You guys aren't speaking the same language. It's just a lot of crossed wires and miscommunications.**" – Patient J	"They **just don't know who the team is. Because** they're sitting down in the emergency room, **they think that the team they see physically is the one taking care of them.** So, I think **that's a big confusion, they think we're still taking care of them.**" – Provider 36	"While we work on the bigger system issues, **we have to do a better job in communicating to patients.** It [wait times] was very shocking for them at times, but **they have to know the truth.**" – Provider 6
Medical Care	• Patients less concerned about impact on care, but report difficulty receiving medications • Boarding overwhelms staff, creates interruptions, and precipitates unsafe conditions • Patients receive lower quality care and worse outcomes	"I had to ask for that [home medication] myself. I had to **demand that**, there was **no pills offered to me** and I still **didn't get one that the doctor promised me.**" – Patient N	"**I just cannot provide that care** [to boarders] **if I'm constantly being interrupted** with more acute patients." – Provider 39 "There have been numerous cases where someone is **diabetic and goes into DKA just waiting for an inpatient team.**" – Provider 30	"I think that boarding **limits our ability to provide the highest quality care.** I feel that for patients, **access to their providers is delayed** and getting **treatment is also delayed** … there's data that shows **people boarding the ED have worse outcomes.**" – Provider 6
Patient Comfort	• Unsanitary bathrooms, lack of privacy and food, and disruptive environment • Emphasized overcrowded rooms and ED stretchers not conducive to long term care • Recognize that overcrowding and lack of privacy are unacceptable	"**The bathroom locks are not working … I'm so scared to use the bathroom.**" – Patient N "[If] you're waiting in a hallway in general it's kind of **dehumanizing** … people **literally waiting by with trash and laundry**" – Patient J	"For one thing, **stretchers are probably the worst thing** you can put someone on who is at **any risk of a pressure injury or pressure ulcer.** It's something that this **hospital is going to pay out of pocket for.**" – Provider 39	"There's no private bathroom, no door, there's a lot of noise and constant beeping and commotion. **It's impossible to feel comfortable in that setting.**" – Provider 3
Long-term Impact	• Patients had a positive opinion of the ED and would return • Frontline providers worried about moral injury, worsening burnout, and many felt ED boarding is not a priority for hospital leadership • Hospital leadership emphasized low patient satisfaction negatively impacts reimbursement and competitiveness	"I have a **long history of a relationship** with [this hospital]. And I do think **the care is excellent**. And I do think the **people are wonderful**. I haven't seen anything to change my opinion of that this morning." – Patient P	"It's just **depressing & exhausting**. & I think there's just also the **moral injury of not providing the best care** for your patients … **none of us feel good** about that." – Provider 39 "It's almost as if **they are willing to accept the mad house of the ER … opposed to recognizing that there are things they can do**. It almost seems as if **we're an accepted evil**." – Provider 10	"If **satisfaction scores are low**, the percentage of **Medicare payment gets decreased**, so we get less payment as a **penalty**. Even a 1% drop can mean a **loss of millions of dollars**." – Provider 4

No, authors do not have interests to disclose

281 Use of Magnetocardiography in the Emergency Department for Diagnosis of Cardiac Ischemia in Acute Chest Pain Patients

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Study Objectives: Acute chest pain is a common emergency department (ED) complaint, and efficiently identifying those with acutely threatening conditions, such as acute coronary syndrome (ACS), is a challenge. The current standard of care relies on electrocardiography (EKG) and serial troponins. Magnetocardiography (MCG) is a non- invasive technique that measures the magnetic field generated by the electrical activity of the heart (Figure). The Avalon-H90 MCG is a novel cardiac screening medical device that uses 57 superconducting quantum interference device magnetic sensors to receive a three-dimensional spatial magnetic signal from the heart without patient contact, radiation, or contrast agents. MCG has been shown to detect ischemia and infarction with high accuracy. This study aims to assess Avalon-H90 MCG as an adjunct in identifying patients with ACS.

Methods: Prospective observational study of a convenience sample of patients presenting with chest pain to an academic ED. After written consent, patients were evaluated with the MCG and the standard of care (EKG and serial troponins). MCG testing was completed after an EKG that was either negative or non-specific for ischemia and before serial troponins were completed. Follow-up was until hospital dismissal and all medical records were reviewed for 30 and 90-day follow up. Diagnostic test accuracy was calculated against the clinical diagnosis as the gold standard. Sensitivity, specificity, likelihood, and predictive values were calculated.

Results: From 100 patients, MCG correctly identified 23 of them as positive and 50 as negative for cardiac ischemia. Twenty-seven patients had false positive results. There were no false negative results. MCG correctly identified all 23 patients with cardiac ischemia. 13 of these were diagnosed at presentation in the ED, 5 by 30-day chart review, and 5 by 90-day chart review. Of 27 false positive patients, 10 patients had concerning cardiac history, 4 patients had pulmonary embolism, and the remaining patients had other underlying health conditions that can affect the normal

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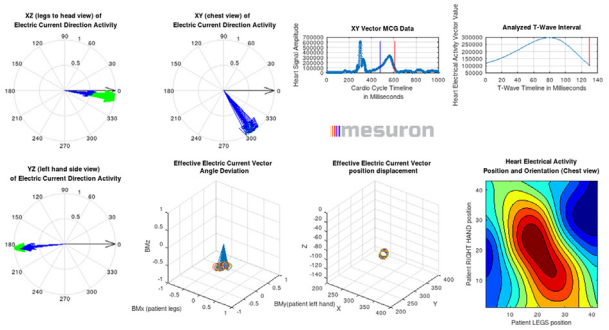
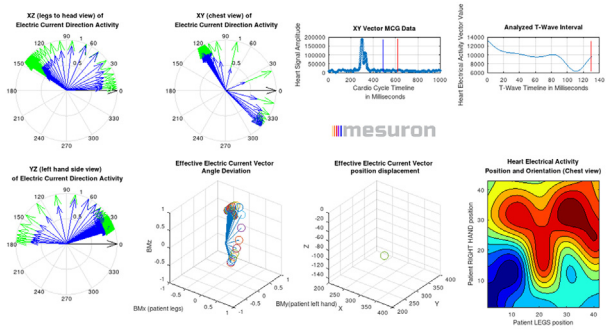
electrical activity of the heart. This results in a prevalence of 23.0%, accuracy of 73.0%, sensitivity of 100% (CI 85.2-100%), specificity of 64.9% (53.2-75.5%), positive likelihood ratio 2.85 (2.1-3.9), negative likelihood ratio of 0.00 (0.0-0.5), positive predictive value of 46% (38.6-53.6%), and negative predictive value of 100% (92.9-100%).

Conclusion: MCG demonstrated high sensitivity in the ED, meaning it can be used to rule out disease. This makes this method a good screening tool for ischemic heart disease among patients with non-diagnostic EKGs. This test is not invasive and may help with disposition and follow up, as it can identify patients with ACS for up to 90 days.

Normal MCG



Abnormal MCG - positive for ischemia



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Stockholder Mesuron Inc.

282 Prevalence, Characteristics, and Outcomes of Patients Who Decline Pulmonary Vascular Imaging During Antenatal Pulmonary Embolism Diagnostics

Qiao E, Campbell A, Heringer G, Florio C, Sperling J, Roubinian N, Vinson D/California Northstate University, Elk Grove, California, US

Study Objectives: Pulmonary vascular (PV) imaging is often indicated in antenatal pulmonary embolism (PE) diagnostics. Unfortunately, computed tomography, pulmonary angiography, and lung scintigraphy expose the fetus to ionizing radiation, increasing risk of childhood leukemia. Concerned about fetal exposure, some pregnant patients decline PV imaging. Little is known about this phenomenon.

Methods: We undertook a retrospective cohort study of outpatients who underwent antenatal PE diagnostics with D-dimer (DD), compression ultrasonography (CUS), PV imaging across 21 community-based U.S. medical centers from 10/2021—03/2023. We included pregnant persons identified during manual chart review with suspected PE who were recommended PV imaging. We excluded those with COVID-19. We used the pregnancy-adapted Geneva score to estimate PE pre-test probabil (PTP). We compared patients who did and did not consent to PV imaging using bivariate analysis. We used quasi-Poisson regression to calculate adjusted relative risks (aRRs) of consenting with 95% confidence intervals (CIs). We reported incidence of follow-up and PV imaging at 14 days as well as 90-day incidence of venous thromboembolism (VTE) and death in non-consenting patients.

Results: Among 679 outpatients tested for acute PE, PV imaging was recommended for 383 (56.4%). Median age was 30.0 years (interquartile range 25.5-34.5); 49 (12.8%) were in the first trimester, 143 (37.3%) in the second, and 191 (49.9%) in the third. Testing was more common in the emergency department (ED) (n=319; 83.3%) than in obstetric (OB) settings (Labor and Delivery or clinic) (n=64; 16.7%). PTP categories were low, n=216 (56.4%); intermediate, n=167 (43.6%), and high, n=0. Overall, 299 (78.1%) consented to and 84 (21.9%) declined PV imaging, with index PE diagnosed in 5 (1.7%) patients by PV imaging. The 2 groups were not significantly different in race/ethnicity, gestational age, and PTP categories (results not shown). We identified differences in age, gravidity, and diagnostic setting (Table). Setting alone was independently associated with consenting to PV imaging (aRR 1.35 [95% CI 1.18-1.54]; P<0.001), when adjusted for age, race/ethnicity, gestational age, gravidity, and PTP. Compared with patients who consented to PV imaging, those who declined underwent more supplemental testing and less commonly had DD values ≥1 mcg/mL (Table). They also more commonly declined chest x-rays: 22/59 (37.2%) vs 0%, respectively. Twelve of 84 (14.3%) non-consenting patients signed against medical advice. Most non-consenting patients (n=69 [82.1%]) were re-evaluated <14 days. Seven non-consenting patients reported persistent or worsening symptoms on follow-up, 6 of whom were seen <7 days. Two of 7 were recommended PV imaging and subsequently consented (after having declined on the index visit). The 2 delayed studies were negative. No non-consenting patient was diagnosed with VTE or died <90 days.

Conclusion: In this multicenter community study of gravid patients tested for PE for whom PV imaging was recommended, 1 in 5 initially declined. The true incidence non-consent is likely higher as we were unable to include in the study those with suspected PE who underwent neither DD nor CUS. Fortunately, non-consenting patients sought re-evaluation if symptoms persisted or worsened, some of whom subsequently underwent delayed PV imaging. In this low-prevalence population, there were no delayed VTE diagnoses among non-consenting patients. Consenting was significantly more prevalent in OB settings compared with the ED, inviting exploration of interspecialty differences in approaching radiation hesitancy.

Table. Characteristics of gravid patients who did and did not consent to pulmonary vascular imaging during index antenatal pulmonary embolism diagnostics

Characteristic	Patients who consented N = 299	Patients who did not consent N = 84	P-value
Age category, years	n (%)*	n (%)*	0.026
<35	213 (71)	70 (83)	
≥35	86 (29)	14 (17)	
Gravidity			0.024
1	71 (24)	24 (29)	
2	69 (23)	29 (35)	
≥3	159 (53)	31 (37)	
Diagnostic setting, n (row %)			<0.001
ED (n=319)	236 (74)	83 (26)	
OB (n=64)	63 (98)	1 (2)	
Accessory diagnostic tests completed			
Chest radiography	81 (27)	37 (44)	0.006
Compression ultrasonography	80 (27)	47 (56)	<0.001
D-dimer	192 (64)	65 (77)	0.023
D-dimer result, mcg/mL†			0.006
<0.5	3 (2)	3 (5)	
0.5 - 1.0	55 (29)	30 (46)	
≥1.0	134 (70)	32 (49)	

* n (column %), except diagnostic setting (row %)
† % calculated from n tested with D-dimer in that column

No, authors do not have interests to disclose

284 Failure Rate of D-Dimer Testing in Patients With a High Clinical Probability of Pulmonary Embolism: An Ancillary Analysis of Three European Prospective Cohorts

Bannelier H, Catoire P, Mélanie R, Freund Y, Thomas K/AP-HP Pitié-Salpêtrière, Paris, Paris, FR

Background: A work-up strategy for the diagnosis of pulmonary embolism (PE) is considered safe if its failure rate is less than 2%. In patients with a high clinical probability of PE, the high prevalence of PE can lower the D-dimer negative predictive value and increase the risk of diagnostic failure. It is therefore recommended that these high-risk patients should undergo chest imaging without D-dimer testing. However, there is limited evidence to support this recommendation.

Study Objective: This study aimed to evaluate the safety of ruling out PE based on D-dimer testing among patients with a high clinical probability of PE.

Methods: Post hoc Bayesian analysis of three European prospective cohorts (PROPER, MODIGLIANI and TRYSPEED). Patients were included in this study if they presented a high clinical probability (according to either the Wells score or the revised Geneva score) and underwent D-dimer testing. In the first 2 cohorts, patients were followed up at 3 months. In the third cohort, all patients underwent chest imaging. The D-dimer based strategy ruled-out PE if the D-dimer level was below the age-adjusted threshold (ie, < 500 ng/ml in patients aged less than 50, and agex10 ng/ml in patients older than 50). The primary endpoint was a thrombo-embolic event in patients with negative D-dimer (ie, less than the age-adjusted threshold), either at index visit or 3-month follow-up. A Bayesian approach estimated the probability that the failure rate of the D-dimer based strategy is below 2% given observed data.

Results: Out of 3,330 patients included in PROPER and MODIGLIANI and 8,444 patients in TRYSPEED, 651 patients (median age 68, 60% female) had D-dimer testing and a high clinical probability of PE, and were included in the study. PE prevalence was 31.3%. Seventy patients had D-dimer levels under the age-adjusted threshold, and none of them had a PE after follow-up (failure rate 0.0% [95% CI 0.0% - 6.5%]. Bayesian analysis reported a credible interval of 0.0% to 4.1%, with a 76.2% posterior probability of a failure rate below 2%.

Conclusion: In this study, there was no PE in patients with a high clinical suspicion of PE and D-dimer levels less than the age-adjusted threshold. However, the large confidence interval precludes a definitive conclusion on the safety of this strategy.

No, authors do not have interests to disclose

285 The ECMIPS Trial: Effects of Cardiac Monitoring on Perceived Stress in Unexplained Syncope

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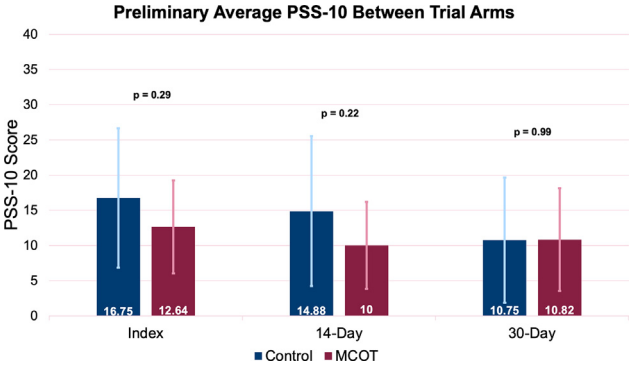
Study Objectives: Syncope is a common emergency department (ED) presentation estimated to cost $2.4 billion annually. Recent efforts have produced clinical decision instruments to estimate which patients have low-risk syncope that may be safe for ED discharge. This sub-study of an open-label RCT of wearable cardiac monitors for unexplained syncope seeks to quantify the effect of wearing a cardiac monitoring device on patient-perceived stress. The goal of this work is to characterize the patient experience and develop a patient-centered approach for individuals who face diagnostic uncertainty. We hypothesize that mobile cardiac outpatient telemetry (MCOT) patch placement will reduce patient-perceived stress compared to usual care.

Background: Despite several diagnostic tools available, many patients with syncope are discharged without an underlying etiology determined. This contributes to the high costs of the health care system. A new development in syncope management from the ED is the use of remote cardiac monitoring for detecting arrhythmias. The effect on patient stress when wearing external cardiac monitors remains uncharacterized. Stress is of particular importance to patients with potential occult cardiac issues such as in unexplained syncope because stress may precipitate arrhythmias.

Methods: This is a randomized, controlled, open-label trial enrolling 160 patients aged ≥50 years who present to a large tertiary care ED with 80,000 annual unexplained syncope or presyncope visits. In this study, the Perceived Stress Scale 10 item (PSS-10) assessment measures the stress of patients who receive a diagnosis of unexplained syncope to compare the perceived stress between those randomized into wearing an MCOT patch or those receiving the standard of care. The primary outcome of this study is differences in the average PSS-10 score between study arms as measured at the time of discharge, 14 days post-discharge, and 30 days post-discharge.

Results: 33 patients have been randomized and 20 patients have completed their participation in the study. Preliminary results show no statistically significant differences in PSS-10 scores at the time of discharge (intervention = 16.75, control = 12.64, p = 0.29) or 14-days post-discharge (intervention = 14.88, control = 10.00, p = 0.22). PSS-10 scores are nearly identical at 30-days post-discharge between both groups (intervention = 10.75, control = 10.82, p = 0.99).

Conclusion: It is possible that there is a statistically significant difference between the groups not readily apparent early in enrollment, as only 12 % of patients have completed their participation. This study is on-track to meet a 2-year enrollment timeline. These results will likely impact how unexplained syncope patients are managed, save significant resources for healthcare systems, and reduce the stress associated with the diagnostic uncertainty of unexplained syncope.



Yes, authors have interests to disclose

Disclosure: Philips Biotel is sponsoring the PI of the parent study

Scientific Study/Trial

Philips Biotel is sponsoring the PI of the parent study

286 Identification of Secreted Modular Calcium-Binding Protein-1 as a Noval Endogenous Protective Molecule Against Acute Myocardial Infarction-Induced Cardiac Rupture

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Background: Cardiac rupture represents a devastating complication for patients suffering from acute myocardial infarction (AMI). The molecular mechanisms underlying this condition remain elusive, and therapeutic targets are currently unavailable.

Methods: Plasma samples were collected from AMI patients and animals. The left ventricular tissue was collected from AMI mice. An unbiased proteomic approach was employed to identify proteins significantly altered in AMI with cardiac rupture. Loss-of-function and gain-of-function animal models were established to determine the cause-effect relationship and underlying molecular mechanisms.

Results: Compared to AMI patients without cardiac rupture, 9 proteins were significantly upregulated, and 24 proteins were significantly downregulated in AMI patients with cardiac rupture. Among these, the secreted modular calcium-binding protein-1 (SMOC-1) was the most significantly upregulated protein in patients with cardiac rupture. Extended patient sample validation and animal model studies confirmed the proteomic finding. A time-course study revealed that SMOC-1 upregulation was robust and transient, peaking 1 day post-AMI and returning to basal levels 1-week post-AMI. In vivo, immunological, and in vitro experiments showed that cardiomyocytes were the primary cell type expressing high levels of SMOC-1 in response to AMI. Cardiomyocyte-specific SMOC-1 knockout doubled the incidence of post-MI cardiac rupture and reduced survival rates, whereas AAV9-mediated SMOC-1 overexpression significantly reduced post-MI cardiac rupture. In vitro and in vivo experiments demonstrated that cardiomyocyte-derived SMOC-1 activates all three critical steps of fibrosis (fibroblast activation, collagen synthases, and collagen maturation), promoting reparative scar formation and attenuating post-MI cardiac rupture. Mechanistically, we demonstrated that SMOC-1 binds with TGF-βR1 and

recruits glutamyl-prolyl-tRNA synthetase (EPRS) in fibroblast, forming a signaling complex that activates the Smad pathway. Inhibition of EPRS abolished the profibrotic effect of SMOC-1.

Conclusions: Our study provides the first evidence that a transient upregulation and secretion of cardiomyocyte SMOC-1 following AMI activates reparative fibrosis by forming a SMOC-1/TGF-βR1/EPRS signaling complex, promoting reparative scar formation and attenuating post-MI cardiac rupture. These results suggest that SMOC-1 could be a novel therapeutic target for preventing cardiac rupture and reducing mortality from AMI.

No, authors do not have interests to disclose

287 Medical Students Perceptions, Confidence, and Knowledge of Ultrasound Education: A National Study

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Study Objectives: The prevalence of ultrasound education in medical school has increased over the past decade, however, a review of the scope and impact is still lacking. Despite increased integration, few institutions offer a comprehensive or longitudinal ultrasound curriculum, resulting in significant variability across programs. The absence of national guidelines further amplifies these disparities. To better understand and highlight the increasing imperative for curricula implementation and regulation, we initiated a national, multi-institutional survey to investigate senior medical students' relationship to ultrasound education across three key dimensions: perception, confidence, and knowledge. This is the first study of this magnitude, shifting the spotlight from the beliefs of physicians and educational leaders to those of the students, who are the pivotal stakeholders in their medical education.

Methods: This multi-institutional study employed a digital survey distributed across numerous sites (distributed by student leaders at each institution), yielding responses from 20 institutions, encompassing over 600 student participants. The survey was structured into three primary sections: perception of education, confidence in ultrasound utilization, and a knowledge assessment with confidence qualifiers. both the confidence and knowledge sections had subcategories. The education and confidence section utilized a 5-point Likert scale. The knowledge assessment included four abnormal/normal, two multiple-choice, and four identification-based questions. Paired t-tests were used to assess the statistical significance of differences between students with and without longitudinal ultrasound curricula in each subcategory. Data collection commenced in March 2024 and is ongoing, we present our preliminary results.

Results: Out of the students surveyed 42.9% were from programs with longitudinal curricula vs 57.1% from those without, 46.4% were 3rd year students and 52.6% of 4th years. For "ultrasound relevance post-residency" 84.7% of students surveyed agreed or strongly agreed; while only 5.3% disagreed, and 3.2% strongly disagreed. Overall positive perception of ultrasound use, and education was significantly higher in longitudinal students 4.21 vs 3.67 (Mean diff. = -0.535, 95% CI [-0.670, -0.401]). Longitudinal students exhibited significantly higher confidence levels in all facets of ultrasound imaging ($p<0.0001$). Reporting greater confidence in obtaining image 3.35 vs 2.29 (Mean diff. = 1.05, 95% CI [0.868, 1.234]), interpreting ultrasound images 3.41 vs 2.64 (Mean diff. = 0.77, 95% CI [0.598, 0.945]), using ultrasound machines 2.84 vs 1.93 (Mean diff. = 0.91, 95% CI [0.754, 1.062]), and performing ultrasound procedures 2.26 vs 1.88 (Mean diff. = 0.38, 95% CI [0.203, 0.555]) compared to their counterparts. Overall confidence was 2.86 vs 2.11 (Mean diff. = 0.75, 95% CI [0.1189, 0.2125]). Moreover, longitudinal students demonstrated greater accuracy in image analysis ($p<0.0001$). Specifically in abnormal/normal image analysis 73.1% vs 56.5% (Mean diff. = 16.6%, 95% CI [0.119, 0.213]), image identification 69.5% vs 45.3% (Mean diff. = 24.2%, 95% CI [0.1835, 0.2998]), and overall accuracy 64.3% vs 47.5% (Mean diff. = 16.9%, 95% CI [0.128, 0.210]) respectively.

Conclusion: Students in longitudinal ultrasound education programs exhibited notably higher confidence levels and greater accuracy compared to their counterparts (Figures 1 and 2), it's crucial to note that these low scores highlight the lack of basic ultrasound knowledge. Despite these findings the majority of students still place a high emphasis on ultrasound education. These findings underscore the current gaps in ultrasound education and urgent need for establishing national standards aligned with students' goals. Addressing current gaps in ultrasound education can elevate the competence and confidence of future physicians, ultimately enhancing patient care and outcomes.

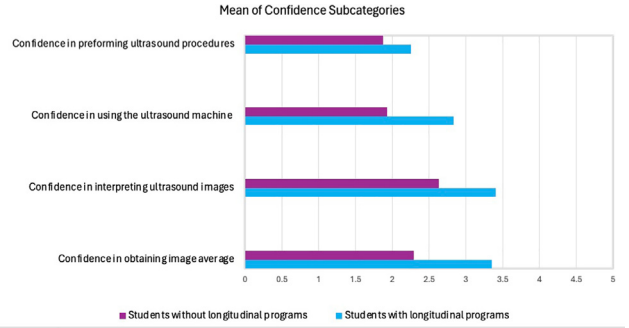

Figure 1. Confidence subcategories scored on a 5-point likert scale strongly disagree to strongly agree.

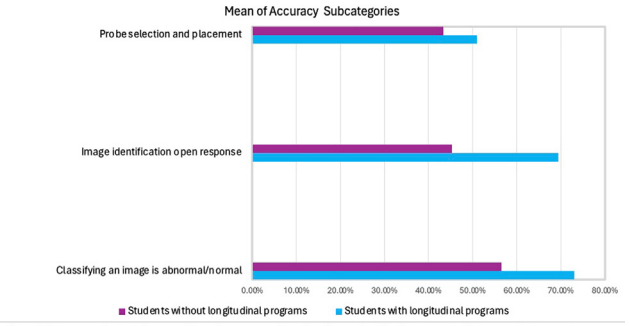

Figure 2. Accuracy subcategories scored based on accuracy based on binary classification, converted into percentage correct.

No, authors do not have interests to disclose

288 Trends in Social Media Use in Emergency Medicine Residency Programs

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Study Objectives: Nearly all emergency medicine (EM) residency programs have some form of social media (SM) presence. Initially focused on education, SM is now a key tool for program branding and recruitment. With recent shifts in the state of SM, including the change in ownership of Twitter (X) and the rise of visual platforms like Instagram (IG) and TikTok, it is important to understand the current trends in EM residency SM use. This study describes and quantifies the current usage of various SM platforms and reports monthly X and IG activity by EM residency programs. We hypothesize that utilization of IG has become more prevalent compared to that of blogs, Facebook (FB), and X, and that fluctuations in SM activity align with key academic year calendar events.

Methods: Using the EMRA Match site, 287 unique EM residency programs were evaluated for the presence of six digital platforms, as self-reported by individual programs. We only included platforms which posted novel content during the study period (September 2022-August 2023). We performed an analysis of monthly post quantity and engagement for the most popular platforms, X and IG. A composite score was created for each platform to capture overall SM engagement (see Figure 1). The monthly posts and composite engagement scores were then compared to the EM academic calendar to evaluate for temporal trends.

Results: Table 1 shows the prevalence of each platform and the percentage of program utilization. Our analysis found that almost all programs maintain a website. X and IG are the most commonly used SM platforms, while FB and blogs are infrequently utilized, and TikTok is nearly absent. While the prevalence of IG is slightly greater than X, the frequency of posting on IG was significantly higher, with a mean of 57 IG posts/program over the year-long study period vs 37 for X. Figure

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1 shows the average monthly posts per platform. There were notable variations in SM posts (Figure 2) and engagement (Figure 3) when compared to crucial milestones in the EM academic calendar. Overall, posting and engagement on IG was higher than X. Both platforms exhibited increased posts at the time of the 2023 National Residency Match. X engagement was highest at the end of recruitment season. There was a general trend in increased IG engagement over time, particularly during graduation and when welcoming new interns, but not at the time of the match.

Conclusion: These findings demonstrate that IG is now the most utilized SM platform for EM residencies, a shift from previous studies that identified X as most popular. A limitation of this study is that IG Stories could not be quantified, meaning that utilization of IG is likely even higher than reported. TikTok is rarely used by EM residencies, despite being one of the most globally downloaded apps, and is a potential for future focus. We note a correlation between EM residency SM activity and the academic calendar that varies by SM platform. Strategic peaks during the end of recruitment season leading to Match Day (February/March) and graduation plus intern orientation (June/July) highlight thoughtful alignment that may be purposeful to optimize SM engagement. Understanding these temporal trends may aid programs to improve their SM impact as well as identify opportunities to increase future engagement.

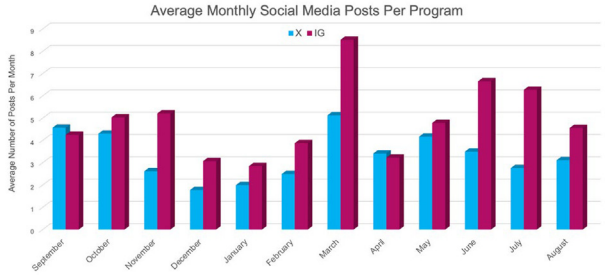
Figure 1. Social Media Engagement Composite Score (Per Month)

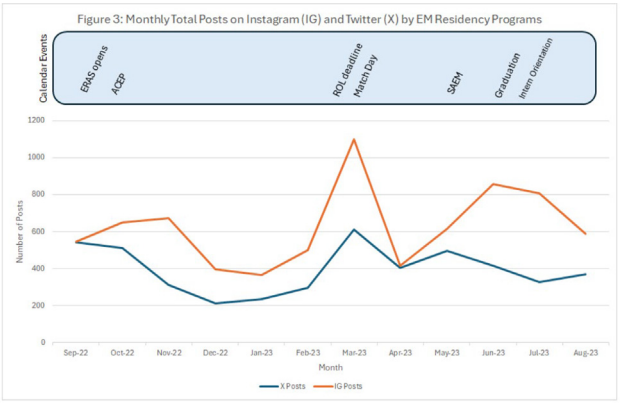
X	IG
Likes + Comments + Reposts/Total Posts	Likes + Comments/Total Posts

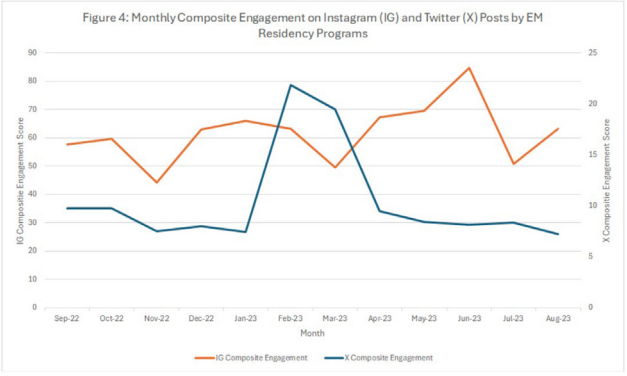
Table 1: Presence of EM residency digital platforms

	Yes	No	Prevalence (%)
Website	244	43	85
Blog	42	245	14
FB	46	241	16
X	120	167	41
IG	129	158	45
TikTok	2	285	0.6

Figure 2. Average monthly social media posts per EM residency program







No, authors do not have interests to disclose

289 Real-Time Implementation of an Advocacy Curriculum to Sustain an Emergency Medicine Residency

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Study Objectives: Advocacy at the local, state and national level is crucial to ensuring quality emergency care is available to patients in all communities and that initiatives critical to emergency physicians are acknowledged. While critical to the profession, advocacy is often not addressed in emergency medicine (EM) residency curricula. The objective of this project is the implementation in real-time of an advocacy curriculum for the resurrection and sustainment of a community emergency medicine residency in South Texas.

Methods: We implemented, in real-time, an advocacy curriculum designed to aid in the resurrection of a community emergency medicine residency. On October 12, 2023, a community EM program and its current residents were notified of a unilateral decision to close the Corpus Christi Emergency Medicine program. Immediately following the closure announcement, faculty elected to implement a grassroots community advocacy curriculum with the aim to reverse the program closure decision. Initial participation was voluntary with resident and faculty self-selecting to participate. Advocacy efforts were aimed at the city, county, state and national levels. Residents formed what later became termed a White Coat Army and began attending local medical society meetings, county commissioner's meetings and reaching out to state and local leaders through both social and conventional media. Data analysis was completed that showed the economic value of the program to the hospital system as well as to the community. The curriculum is still in development but continues to grow and evolve. It includes advocacy topic discussions during didactics and participation in advocacy efforts by residents and faculty at the local and state levels. The residency program has also recently increased community outreach efforts with the implementation of street-level medicine in partnership with local EMS and police partners.

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Results: There were 36 residents and 12 faculty that self-selected to participate in the real-time implementation of grassroots community advocacy. The overall result of this advocacy was not only the resurrection of the EM residency program but also the implementation of an advocacy curriculum. In December 2023, due to advocacy efforts, the local county hospital district found the EM residency to be vital to the health of the local community and voted to fund the program. This reinstatement is the first of its kind in emergency medicine training to occur and has resulted in the implementation of a sustained advocacy curriculum for the Christus Health/Texas A&M School of Medicine emergency medicine residency program.

Conclusion: Advocacy is crucial to sustain an emergency medicine residency within the community. The Christus Health/Texas A&M School of Medicine emergency medicine residency implemented a grassroots community advocacy program in real-time resulting in shift in perception of need by the community and the resurrection and long-term sustainment of the program due to its advocacy efforts.

No, authors do not have interests to disclose

290 Comparison of Characteristics of Emergency Medicine Residency Programs With Unfilled Positions in the 2023 and 2024 Match

Preiksaitis C, Abubshait L, Little A, Lewis K, Bowers K, Nash C, Landry A, Gottlieb M/Stanford University, Palo Alto, California, US

Study Objectives: This study aims to identify the persistent and emerging factors influencing unfilled emergency medicine (EM) residency positions in the 2024 National Resident Matching Program (NRMP) Match. Building upon previous analyses, including our examination of the 2023 Match data, we seek to validate and expand our understanding of the program characteristics associated with unfilled positions. By adopting a Bayesian analytical approach, we integrate prior findings with the latest Match outcomes, providing a comprehensive and probabilistic assessment of these influential factors. Ultimately, our objectives are to inform strategic decision-making by residency programs, mentors, and national bodies, while also projecting potential future staffing challenges within the EM workforce.

Methods: We conducted a cross-sectional, observational study examining the relationship between EM residency program characteristics and the likelihood of having unfilled positions in the 2024 Match. Using a Bayesian hierarchical modeling approach, we incorporated prior knowledge from our 2023 Match analysis into the current study, allowing for dynamic updating of parameter estimates. The dataset included publicly available NRMP data on EM programs, encompassing variables such as program size, location, ownership structure, and historical accreditation. We used Markov Chain Monte Carlo (MCMC) methods to fit our Bayesian logistic regression model, accounting for intra-program variability through random intercepts. Convergence diagnostics, posterior predictive checks, and effective sample size evaluations were completed. Findings are reported as odds ratios with 95% credible intervals.

Results: The 2024 Match involved 281 EM programs, with 135 PGY-1 positions (4.5%) remaining unfilled across 54 programs. Our Bayesian analysis identified seven program characteristics significantly associated with unfilled positions (Figure 1): previous unfilled positions (OR 52.98, 95% CrI 27.11–105.64), smaller program size (<8 positions, OR 19.49, 95% CrI 6.11–63.43; 8-10 positions, OR 3.82, 95% CrI 1.22–11.47; 11-13 positions, OR 5.87, 95% CrI 1.99–17.64), located in the Mid-Atlantic (OR 9.78, 95% CrI 2.89–34.47), prior osteopathic accreditation (OR 5.53, 95% CrI 2.01–15.49), located in South Atlantic (OR 4.62, 95% CrI 1.34–16.12), located in East North Central (OR 3.86, 95% CrI 1.14–13.87), and corporate ownership structure (OR 3.16, 95% CrI 1.28–7.69).These findings reinforce and expand upon our previous work, highlighting the persistent influence of program size, geographic location, historical factors, and ownership models on Match outcomes.

Conclusion: Our study provides a comprehensive assessment of the factors associated with unfilled EM residency positions, using a Bayesian approach to integrate prior knowledge with the latest Match data. The reduction in programs with unfilled positions from 2023 to 2024 signals progress, yet challenges persist, particularly among smaller programs and those in specific geographic regions. Our findings underscore the need for focused attention from stakeholders, including residency programs, mentors, and national bodies, to address these ongoing issues. Continued monitoring and strategic interventions are crucial to ensure a sustainable EM workforce capable of meeting healthcare demands effectively. By identifying these influential factors, our study lays the groundwork for refining recruitment strategies, informing program accreditation decisions, and projecting future staffing needs within the EM specialty.

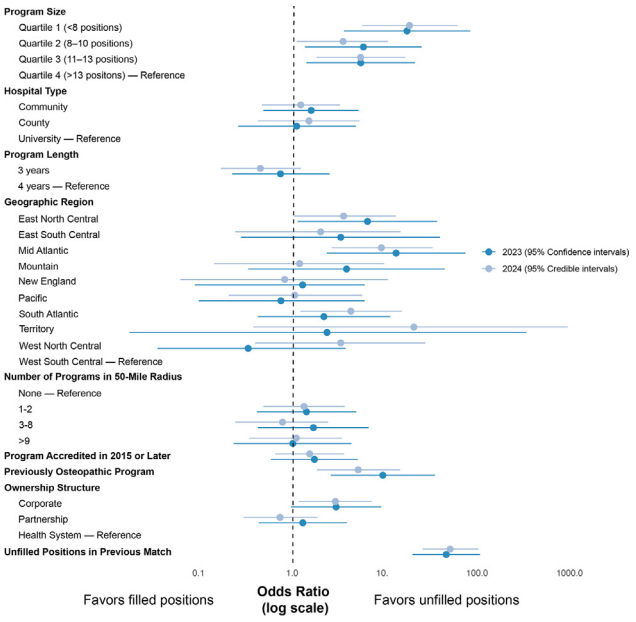

Figure 1: Comparison of adjusted odds ratios of having an unfilled position at emergency medicine programs in the National Resident Matching Program in 2023 versus 2024.

No, authors do not have interests to disclose

291 Visualizing Pediatric Critical Care FY 2020 - 2022 Fellow Tracheal Intubation Learning Curves

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Study Objectives: Tracheal Intubation (TI) is a life-saving procedure for pediatric intensivists. Developing proficiency in TI is one of the goals in the Pediatric Critical Care Medicine (PCCM) fellowship. We aim to develop a dashboard for PCCM fellows to visualize their own learning curves and proactively identify educational needs. We hypothesize majority of the fellows will achieve TI competence during 3 years.

Methods: Using the local airway management quality improvement database (a part of National Emergency Airway Registry for Children: NEAR4KIDS), we build a data field for each fellow training ID. Using REDCap and R, we developed a cumulative sum (CUSUM) learning curve visualization to achieve competence level. We piloted the data visualization in the cohort of PCCM fellows starting at FY 2020 - 2022 for their TIs in the PICU for first 3 years of fellowship. TI competence threshold was a priori defined: 80% success at first attempt with both alpha and beta at 0.1.

Results: 948 TI encounters were performed by 20 fellows (median 37 encounters, IQR 34-43 per fellow) (Table 1). First attempt success rate was mean 83% (IQR 76-87%[W사1]). CUSUM curve was successfully plotted from the database. 15/20 (75%) PCCM fellows achieved competency with 80% of first attempt success rate (Table 2). The TI count to achieve competency was median 15 (IQR 12-18) (Table 3).

Conclusions: The number of tracheal intubations needed to achieve procedural competence amongst pediatric critical care fellows is variable. Only 75% of the PCCM fellows met the criteria for competence level defined as 80% first attempt success. While repeated procedural attempts may lead to competency for some fellows, individualized educational strategies may be necessary for others.

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Demographics	Before Achievement, N = 403[1]	After Achievement, N = 226[1]	p-value[2]
Location of Intubation			>0.9
PICU	348 (86%)	195 (86%)	
CICU	42 (10%)	25 (11%)	
ED	4 (1.0%)	2 (0.9%)	
Other	9 (2.2%)	4 (1.8%)	
Age Group			0.2
<1 Year Olds	121 (30%)	53 (23%)	
1 - <8 Year Olds	135 (33%)	84 (37%)	
8 - <18 Year Olds	117 (29%)	65 (29%)	
>=18 Year Olds	30 (7.4%)	24 (11%)	
Any Difficulty of Intubation			0.2
Difficult airway	92 (23%)	62 (27%)	
Moderate airway	311 (77%)	164 (73%)	
First Attempt Success	340 (84%)	191 (85%)	>0.9

[1] n (%)

[2] Fisher's exact test; Pearson's Chi-squared test

No, authors do not have interests to disclose

292 Designing Didactic and Simulation Sessions for Online Medical Control Training for Emergency Medicine Residents

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Background: In many large urban EMS systems including New York City (NYC), only EMS fellows and attending physicians typically provide online medical control. This creates an educational gap in many emergency medicine (EM) residencies nationally. Recognizing this, we introduced a curriculum focused on the often-overlooked role of online medical control in an emergency physician's responsibilities. The curriculum was designed to bridge the knowledge gap between EM residents and online medical control. This consisted of a session that integrated a didactic lecture with hands-on simulated online medical control calls from paramedics to EM residents. The goal was to measure the shifts in residents' comprehension and confidence surrounding EMS and online medical control post- intervention.

Methods: We engaged 47 participants, comprising EM residents and medical students on an EM sub-internship (74% with no prior EMS experience, 62% EM PGY1-4). Using a 7-point Likert scale, we assessed their understanding of EMS provider levels, medical control types, and other EMS facets. After the didactic lecture, participants engaged in simulated online medical control calls. Their responses were assessed again post-intervention.

Results: There was a marked enhancement in understanding basic EMS systems (3.7 to 5.9), certifications (3.3 to 5.8), local EMS protocols (2 to 5.5), and comfort of online medical control (2 to 5.5) all with p-values < 0.001. The upward trend in mean scores across all queried areas underscored the potency of merging didactic lectures with simulated calls, especially within the context of providing online medical control within an EMS framework that typically excludes residents.

Conclusions: The field of EMS and specifically online medical control can often be overlooked in the education of EM residents. These findings show that didactics paired with simulation of online medical control calls enhanced understanding of both basic EMS systems and online medical control, and can easily be incorporated into the EM resident curriculum. While rooted in NYC's context, this curriculum can be adapted to most regions where online medical control operates through a centralized, resident-excluded model. The primary constraints are the single-center nature and the possibility of response bias. Ongoing research involves a longitudinal experience of on-shift simulated online medical control calls to senior EM residents.

No, authors do not have interests to disclose

293 Prehospital Antibiotics Reduce Mortality From Septic Shock by More Than One-Half

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Background: Sepsis is a medical emergency, with mortality that exceeds that of myocardial infarction, stroke and trauma. Early administration of fluids and antibiotics are important time-sensitive treatment measures for sepsis patients. Every 1-hour delay in antibiotic administration = 4-8 % increase in hospital mortality, especially in septic shock. If sepsis is detected in the prehospital phase, then these treatment measures could be instituted even earlier, which may improve the patients' prognosis.

Methods: This is an IRB approved prospective observational study conducted as part of our county EMS system's quality and research program. Our EMS system is one of the largest in our state, responding to more than 115,000 calls per year, and covering a geographic footprint of over 2,010 square miles. Our prehospital sepsis protocol includes medical patients 18 years or older with abnormal vital signs per the Centers for Disease Control with two or more positive SIRS criteria + altered mental status, presence of risk factors (immunocompromise, indwelling foley catheter, cancer, nursing home resident) and a positive shock index defined as a shock index $>$ 1 or a modified shock index of <0.7 or > 1.3. These patients are considered sepsis alerts, and are given 30ml/kg intravenous fluids. In 2022, we introduced prehospital antibiotics for patients considered to be in septic shock, defined as a MAP < 70 mmHg. Hypotension management included dopamine followed by epinephrine or norepinephrine (not a change). We examined mortality rates before and after the introduction of prehospital antibiotics.

Results: The median age of the cohort was 71 years, IQR 61-80, 45% female, 84% White, 13% Black, and 3% other. Over the 4 years (2 years before and 2 years after protocol change), 1,447 consecutive sepsis alert patients were called on, with an ultimate sepsis diagnosis accuracy of 59-64%. Of those admitted to the hospital after transport, the diagnostic accuracy rose to 92%. Lactate was elevated 48-56% of the time. Approximately 9% of the cohort had a MAP$<$ 70 mmHg. The mortality rate for patients given ceftriaxone in the field compared to those without was significantly lower (15.8% vs 6.8%, P=0.0307, z-test for proportions).

Conclusion: Our county EMS experience with implementing prehospital antibiotics demonstrates that in carefully screened sepsis patients, prehospital antibiotics significantly reduce mortality, keeping other parameters in the protocol the same.

	2023	2022	2021	2020
Called	273	253	463	458
Sepsis dx	175	161	278	272
% Correct	64%	64%	60%	59%
# admitted	250	235	428	423
% admitted	92%	93%	92%	92%
# of Septic Deaths	18	20	34	40
% of Septic Deaths (all)	10%	12%	12.20%	14.70%
% of Septic Deaths without antibiotics	16.1%	15.9%		
% of Septic Deaths with antibiotics	7.0%	6.7%		
# High Lactic Acid	154	127	222	235
% High Lactic Acid	56%	50%	48%	51%

No, authors do not have interests to disclose

294 The Use of Prehospital Ultrasound: A Scoping Review

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Background: With the advent of portable and handheld devices, prehospital ultrasound (PHUS) has become increasingly available and researched. PHUS has the potential to expedite care, provide clinical and procedural decision support for EMS clinicians, and alter transport destinations. This scoping review examines the current literature on PHUS, including studied indications for PHUS use, level of training employing PHUS, and research outcomes of interest.

Methods: We conducted a systematic search in December 2022 across PubMed, Embase, Web of Science, CINAHL, and Cochrane databases. Two independent reviewers screened titles and abstracts with a third reviewer for adjudication,

followed by full-text analysis. Inclusion criteria were published research and conference abstracts from the inception of databases of articles focused on PHUS with scans performed within the prehospital arena. We excluded reviews, case reports, letters to the editor, and research published in non-English language. Kappa was calculated for interrater reliability after title and abstract screening. Data regarding published date, study type, prehospital clinicians within the study, indication for PHUS, and EMS transport setting were collected and categorized systematically by two independent reviewers.

Results: Our search identified 9,718 unique articles of which 109 were included in final analysis after title and abstract review (Kappa 0.68) and full-text analysis. Annual publications increased from 1 in 2000 to 16 in 2022. Nineteen countries were represented with the United States having the highest number of publications (n=34, 31.2%). Most studies were prospective (n=74, 67.9%) with six randomized control trials identified (5.5%). Feasibility studies comprised 45.9% (n=50) of the included publications, while patient-related clinical outcomes was the primary research interest in only 18 studies (16.5%). The most studied prehospital clinicians were physicians (n=58, 53.2%) and paramedics (n=38, 34.9%). The most common indication for PHUS was trauma (n=49, 45%) with the Focused Assessment with Sonography in Trauma (FAST) as the study of choice in 33% of all studies (n=36). Dyspnea was the second most common indication for PHUS with 13 studies (11.9%), followed by cardiac emergencies.

Conclusion: There is a growing, heterogeneous body of literature describing the use of PHUS. The majority of published literature was prospective and described feasibility trials. The FAST exam for trauma was the most studied PHUS. Notable identified gaps include a lack of studies in pediatric patients and a lack of research identifying clinical outcomes.

No, authors do not have interests to disclose

295 Reasons for Emergency Department Transport During Home Visits for Patients With Heart Failure in a Mobile Integrated Health Program

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Study Objective: Our Mobile Integrated Health (MIH) program combines community paramedic home visits with telehealth encounters by physicians, which enables patients to be assessed at home. Our program may be particularly helpful for patients living with heart failure (HF) to assess their need for transport to an emergency department (ED) for evaluation of acute symptoms. HF patients, compared to non-HF patients, have had a greater proportion of ED visits to address concerns with acute symptom management. We aimed to assess which clinical factors assessed using a standardized checklist completed by community paramedics were associated with immediate transport to the ED during a community paramedicine home visit.

Methods: We performed a secondary analysis of community paramedic home visits conducted between 2021 and 2024 among heart failure patients enrolled in a MIH program serving six EDs affiliated with an urban integrated health system in New York City. Home visits could be initiated by patients, care partners, primary or specialty care providers, or care managers. Community paramedics conducted a standardized assessment consisting of a symptom inventory and physical examination, and facilitated a telehealth encounter with a physician for further evaluation. Based on this evaluation, patients could be transported immediately to the ED or continue home management. We examined the following heart failure-specific factors for this analysis: abnormal vital signs, abnormal lung examination, lower extremity edema, decreased oral intake, decreased energy level, remaining in bed greater than 50% of the time, having a weight scale at home, recording weight daily, present weight above dry weight, and orthopnea. Multivariable logistic regression was used to identify factors associated with greater odds of immediate transport to the ED.

Results: Of 2,678 home visits, 67 (2.5%) resulted in ED transport over four years. Prevalence of heart failure factors among these home visits were: abnormal vital signs (4.5%), abnormal lung examination (9.6%), leg edema (17.7%), decreased oral intake (14.2%), decreased energy level (47.3%), remaining in bed greater than 50% of the time (11.9%), having a weight scale at home (88.8%), recording weight daily (15.3%), present weight above dry weight (8.1%) and orthopnea (35.5%). In the multivariable logistic regression analysis (Table), only an abnormal lung examination, patient report of decreased energy, and remaining in bed greater than 50% of the time were associated with the need for immediate ED transport during the home visit.

Conclusion: Among 2,678 community paramedic home visits with heart failure patients over four years, the need for immediate transport to an ED was infrequent. Patients requiring transport were more likely to have abnormal lung examinations highlighting the essential role of community paramedics providing in-home physical examinations. These findings inform MIH programs developing protocols for remote monitoring of HF patients by identifying which patients are more likely to need transport to an ED for further evaluation.

Table 1: Heart Failure Specific Findings on Community Paramedic Checklist and Need for Emergency Department Transfer

Finding during home visit	No (N=2678)	Yes (N=67)	Unadjusted p-value	Adjusted Odds Ratio (95% CI)
Abnormal vital signs	11 (0.4%)	1 (1.5%)	0.257	2.43 (0.13 - 14.2)
Abnormal lung exam	251 (9.4%)	14 (20.9%)	0.005*	2.83 (1.35 – 5.63)**
Leg edema present	476 (17.8%)	12 (17.9%)	1.000	0.56 (0.25 – 1.16)
Decreased oral intake	2306 (86.1%)	48 (71.6%)	0.002*	0.70 (0.39 – 1.29)
Decreased energy level	1247 (46.6%)	52 (77.6%)	< 0.001*	3.77 (2.10 – 7.29)**
In bed >50% of the time	308 (11.5%)	21 (31.3%)	< 0.001*	2.43 (1.35 – 4.27)**
Has scale at home	2368 (91.8%)	54 (81.3%)	0.021*	0.55 (0.28 – 1.16)
Recording weight daily	415 (15.5%)	7 (10.4%)	0.306	0.61 (0.24 – 1.35)
Above dry weight	214 (8.0%)	10 (14.9%)	0.065	1.89 (0.84 – 3.96)
Orthopnea present	895 (33.4%)	27 (40.3%)	0.241	1.27 (0.71 – 2.24)

Statistically significant in univariate Fisher Exact chi-square tests of association (*) and multivariate linear regression model (**)

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296 Paramedic Choice of IM Midazolam Over IM Ketamine for Behavioral Emergencies

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Background: On January 15, 2023, Suffolk County adopted the NYS Collaborative EMS protocols which allow for EMT-Paramedics to choose to administer either Midazolam 5mg IM or Ketamine 250 mg IM for sedation of the agitated patient under the behavioral emergencies protocol under standing orders. A repeat dose administration is authorized after 5 minutes if necessary.

Methods: Data was reviewed from the Suffolk County EMS system which observes over 180,000 calls annually. From January 15, 2023 until January 15, 2024, there were 411 administrations of sedation under the behavioral emergencies protocol by EMT-Paramedics.

Results: Of the 411 administrations, 372 patients received Midazolam 5mg IM (91%) and 9 received Ketamine 250mg IM (9%). For the 372 patients who received Midazolam, 98 patients required a repeat dose administration (26%). For the 39 patients who received Ketamine, 4 required a repeat dose administration (10%). Of the 98 patients who received Midazolam and who required a repeat dose administration, only 2 patients received Ketamine as the second medication choice and 96 patients received a repeat dose administration of Midazolam. The reported incidence of adverse reactions in these patients was observed to be very low. Only 14 of the 372 patients who received Midazolam suffered a serious adverse reaction (4%) defined as the need for assisted ventilation, placement of a supraglottic airway or endotracheal intubation. Only 1 patient who received Ketamine suffered an adverse reaction (2%). In all, 396 patients suffered no serious adverse effect from the use of the protocol (96%) and no cardiac arrests or deaths were observed.

Conclusion: When given a choice of either Midazolam 5mg IM or Ketamine 250mg IM for behavioral emergencies, EMT-Paramedics overwhelmingly chose Midazolam in this study. However, there was a higher incidence of these patients requiring a repeat dose administration in the use of Midazolam as the medication choice.

No, authors do not have interests to disclose

297 Association of Social Determinants of Health With Emergency Department Wait Time Disparities

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Study Objective: Wait times at various stages of emergency department (ED) care have been linked with differences in care outcomes and the patient

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experience. Longer time spent in the waiting room has been associated with patients leaving without receiving care, and along with longer time to admission and length of stay (LOS), increased mortality. ED wait times can serve as a marker of care disparities between patient demographic groups. The goal of this study is to utilize a large national database, Epic Cosmos, to characterize ED wait times according to patient demographics and the social determinants of health (SDOH).

Methods: This retrospective cohort study used a large national deidentified electronic health database with 227 million patients (Epic Cosmos). The inclusion criterion was presentation to a United States ED between January 1, 2019, and March 7, 2024. Patient demographics and SDOH included race, ethnicity, legal sex, gender identity. Results are reported as percentage of patients within each demographic. The primary outcomes were time from arrival to provider first seen (dichotomized into two groups, ≤30 or >30 minutes), and time from bed request to admission (≤120 or >120 minutes). Secondary analyses were performed using area codes (large metropolitan, metropolitan, small town, rural) and area deprivation index (ADI) in order to account for potential confounders of hospital size, capacity, or location. Statistical analysis was performed using Chi-squared analysis to the degree required by the comparison.

Results: There were 156,662,928 ED encounters identified with 31,098,418 encounters resulting in an admission to the hospital. A higher percentage of White patients were seen by a physician in ≤30 minutes (64% vs other races ranging from 57-60%, p<0.00001). White patients also experienced less time from bed request to admission in ≤120 minutes (47%) compared to patients of other races (range 41-44% p<0.00001). These results did not change when accounting for area code and ADI. While there was no significant difference in arrival to provider seen, more non-Hispanic/Latino patients waited ≤120 min for a bed after admission compared to Hispanic/Latino patients (46% vs 42%, p<0.00001), and this difference was similar across area codes and ADI. No significant differences were seen in ED wait times with recorded legal sex. Patients identified as transgender male experienced the highest frequency of bed request to admission in ≤120 minutes compared to other identified gender (49% vs range 40-43%, p<0.00001). This trend remained similar when accounting for ADI and in metropolitan areas, but was reversed in small town area codes.

Conclusion: Significant ED wait time disparities were observed according to race, ethnicity and gender identity. These disparities remained despite accounting for area code (metropolitan vs small town vs rural) and ADI. In the context of the association between longer wait times and poor care outcomes, these differences may lead to clinically significant differences in patient outcomes. Understanding wait time bias based on the SDOH is necessary to identify opportunities for the implementation of improved care standardization.

No, authors do not have interests to disclose

298 Sepsis Presentation, Interventions, and Outcome Differences Among Men and Women in the Emergency Department

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Study Objectives: Sepsis is a common presentation to the emergency department (ED) and represents a life-threatening syndrome with high mortality rates. The existing literature has conflicting findings regarding outcomes between sexes. The goal of this study was to investigate the clinical presentation, interventions, and outcomes based on sex for sepsis in the ED.

Methods: A retrospective cohort study was conducted to identify patients presenting with sepsis to the ED. We employed the Global Collaborative Network from 119 healthcare organizations (HCOs) in the TriNetX Research Network. Sepsis was defined according to ICD-10-CM codes. To evaluate sex differences in sepsis presentation, we collected data on age, comorbidities, sex, vital signs, laboratory values, medications, ICU admission, mechanical ventilation, and mortality at 30 days, 90 days, and 1 year. A 1:1 propensity score matching by age, race, and comorbidities was used to identify and balance potential risk factors across the study groups to investigate mortality, infection source, interventions, and ICU admission trends. A secondary analysis included UTI as the infection source in the propensity score matching to account for potential confounding.

Results: In total, 920,160 patients were included in this study. The most common infection source for both females and males was respiratory, accounting for 40% and 46.2% of sepsis cases, respectively (Table). A urinary infection source was more common in females, whereas respiratory, abdominal, and skin and soft tissue infection sources were more common in males. Females were less likely to receive vasopressors, beta-lactamase inhibitors, piperacillin-tazobactam, and vancomycin. Females were more likely to receive second-generation cephalosporins, third-generation cephalosporins, quinolones, metronidazole, ceftriaxone, and carbapenems than males. Females were also less likely to require ICU admission within 30 days or mechanical ventilation. Females had a lower all-cause mortality rate at 30-days (OR, 0.91; 95% CI, 0.90–0.92), 90-days (OR, 0.91; 95% CI, 0.90–0.92), and 1-year (OR, 0.90; 95% CI, 0.89–0.91). A secondary analysis in which propensity scored matching was used to establish two cohorts with approximately equal numbers of patients with UTI as their infection source showed that females were less likely to receive piperacillin-tazobactam (OR, 0.76; 95% CI, 0.75–0.77), vancomycin (OR, 0.87; 95% CI, 0.86–0.88), and vasopressors (OR, 0.92; 95% CI, 0.91–0.93). After adjusting for UTIs, females still had a lower all-cause mortality at 30-days (OR, 0.94; 95% CI, 0.93–0.95), 90-days (OR, 0.95; 95% CI, 0.94–0.92), and 1-year (OR, 0.93; 95% CI, 0.92–0.94).

Conclusion: Females demonstrated 10% lower odds of mortality from sepsis at 30-days, 90-days, and 1-year. Females were less likely to receive vasopressors, vancomycin, or piperacillin-tazobactam, even after accounting for UTI as the sepsis source.

Table 1: Clinical outcomes of sepsis patients stratified by sex.

Outcome	Females–no. (%) n = 460,080	Males–no.(%) n = 460,080	OR	95% CI	P-value
Mechanical ventilation	47,848 (10.4)	67,172 (14.6)	0.76	0.75–0.77	<0.0001
ICU admission within 30 days	135,263 (29.4)	167,929 (36.5)	0.85	0.84–0.86	<0.0001
Infection source					
Respiratory	184,032 (40.0)	212,557 (46.2)	0.86	0.85–0.87	<0.0001
Urinary	136,643 (29.7)	86,034 (18.7)	1.73	1.71–1.75	<0.0001
Abdominal	17,022 (3.7)	14,722 (3.2)	1.15	1.12–1.17	<0.0001
Skin and soft tissue	47,388 (10.3)	63,491 (13.8)	0.72	0.71–0.73	<0.0001
Unknown origin	74,993 (16.3)	83,274 (18.1)	0.74	0.73–0.75	<0.0001
Septic shock	69,932 (15.2)	71,772 (15.6)	0.97	0.96—0.98	<0.0001
In-hospital mortality					
30-day mortality	55,670 (12.1)	59,810 (13.0)	0.91	0.90–0.92	<0.0001
90-day mortality	78,673 (17.1)	86,034 (18.7)	0.91	0.90–0.92	<0.0001
1-year mortality	98,917 (21.5)	107,199 (23.3)	0.90	0.89–0.91	<0.0001

No, authors do not have interests to disclose

299 Racial Disparities in Concussion Among High School Students in the United States

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Study Objectives: The primary objective of this study was to determine if there was a relationship between race and concussions among high school students living in the United States. Previous studies have included race as a descriptive variable, rather than examining it as a primary exposure. It has been shown that there are differences in access to concussion care among racial groups. Additionally, variation in concussion knowledge and injury prevention may also play a role in concussion disparities.

Methods: We analyzed the 2021 Youth Risk Behavior Survey (YRBS), a nationally representative sample of English-speaking students in grades 9-12 at public or private schools, living in the United States. A total of 209 schools were sampled, from February to May of 2021. Over 17,000 students completed the survey. Students reported if they had a concussion in the past 12 months. To account for the complex survey design, survey weights were used and a complete case analysis was conducted. A

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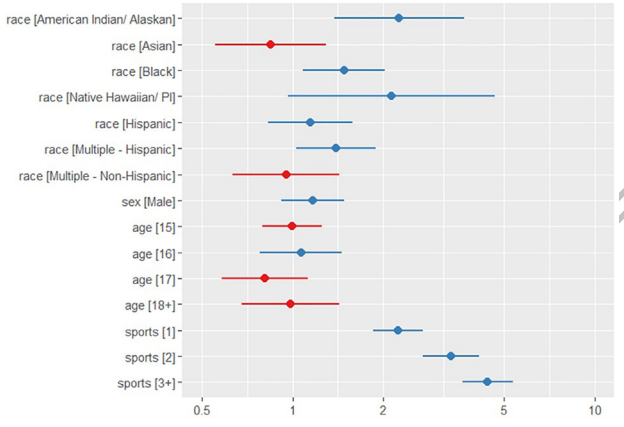
binary logistic regression was conducted to examine the association between concussion in the past 12 months and race, adjusting for age, sex, and number of sports teams played on in the past 12 months.

Results: A total of 13,945 weighted participants were used in the complete case data set. 11.7% had at least one concussion in the past 12 months. 48.8% of students were White, 16.3% multiple races – Hispanic, and 12.3% Black/African American. Concussion was most frequent among American Indian/Alaskan Native (20.7%) and Native Hawaiian/Pacific Islander (19.9%), followed by Black/African American (14.1%). After logistic regression, for the race/ethnicity category, there is a significant relationship with concussion ($p<0.001$). Compared to White students (the reference category), American Indian/Alaskan Native students have 2.25 times the odds of concussion in the past 12 months (95% CI 1.37, 3.70), Black/African American students have 1.48 times the odds of concussion in the past 12 months (95% CI 1.08, 2.02), and Multiple race – Hispanic students have 1.39 times the odds of concussion in the past 12 months (95% CI 1.03, 1.89). The Figure depicts the adjusted odds ratios and confidence intervals visually in a forest plot.

Conclusion: Race/ethnicity was associated with concussion in the past 12 months among high school students in the United States, with American Indian/Alaskan Native, Black/African American, and Multiple race – Hispanic students having significantly higher odds of concussion compared to White students.

Figure 1: Weighted Binary Logistic Regression of the Odds of Concussion Associated with Race/Ethnicity



No, authors do not have interests to disclose

300 Patient Sex and Age Affects Odds of Receiving POCUS Exam During Emergency Department Visit

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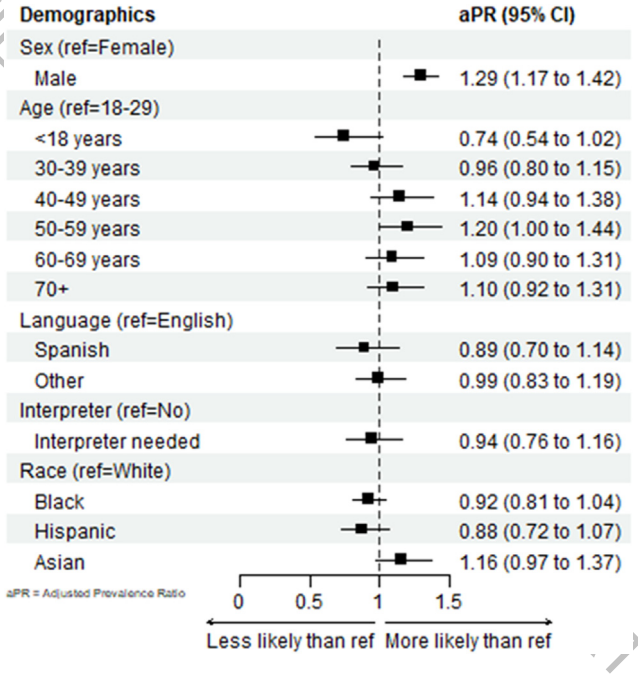
Study Objectives: Point-of-Care Ultrasound (POCUS) has proven integral to the care of many emergency department patients. Meanwhile, racial disparities in healthcare have been well documented across many areas of patient care. We aimed to evaluate whether there may be variability in POCUS use related to patient demographics such as age, sex, race, language, and need for an interpreter.

Methods: Data were collected from all patient visits at a large tertiary care hospital for a three-month period (January-March 2023). The outcome measure of interest was whether a patient received a POCUS exam. Disparities of POCUS use were evaluated for patient Age (<18 years, 18-29 years, 30-39 years, 40-49 years, 50-50 years, 60-69 years, 70+ years), Sex (male, female), Race (White, Black/African American, Hispanic/Latino, Asian), Language (English, Spanish, Other), and use of an Interpreter (Yes, No). We estimated the prevalence of POCUS use and we estimated the adjusted prevalence ratios (aPRs) and 95% Confidence Intervals (CIs) using a Poisson regression, accounting for multiple encounters within patients using generalized estimating equations. Factors associated with POCUS use included in the regression model were triage Acuity level (1-5 or unknown), Diagnostic group (eg, cardiovascular, trauma, gastroenterology) and Encounter type (eg, emergency room, observation, inpatient). Patient data were excluded if the patient had been seen in the emergency department four or more times within the study dates. We also removed visits for which ultrasound status and diagnostic group were not recorded, or when diagnostic group or encounter type had fewer than 15 patients or had no patients who received a POCUS exam.

Results: The study included 22,699 visits from 17,713 unique patients, mean age 46.0 (SD=21.6), 8,770 (49.5%) male. Our final sample included 18,219 visits from 15,701 unique patients, mean age 46.3 (SD=21.6), 7,726 (49.2%) male. The overall prevalence of POCUS use in this sample was 8.7%. Disparities in POCUS use were observed for sex, with males having greater prevalence of receiving a POCUS than females, aPR 1.29 (95% CI 1.17 to 1.42). Patients aged 50-59 years also had greater prevalence of receiving a POCUS exam compared to the reference group of 18-29-year-olds, aPR 1.20 (95% CI 1.00-1.44). No disparities in POCUS use were observed for race (ref=White: Black/African American aPR 0.92 (95% CI 0.81-1.04); Hispanic aPR 0.88 (95% CI 0.72-1.07); Asian aPR 1.16 (95% CI 0.97-1.37)), language (ref=English: Spanish aPR 0.89 (95% CI 0.70-1.14); Other non-English language 0.99 (95% CI 0.83-1.19)), or interpreter use (ref=No Interpreter: Interpreter used aPR 0.94 (95% CI 0.76-1.16)).

Conclusions: Different patient demographics may affect the care patients receive, in this case, the prevalence of POCUS use. Increased POCUS use in older patient cohorts can be expected as these patients have more comorbidities that could affect need for ultrasound. Increased POCUS use in male patients is more challenging to explain though also may be related to specific comorbidities for which ultrasound has utility (eg, Urinary retention). We did not observe disparities in POCUS use by race or language. Further research is warranted including a larger patient cohort and multiple hospitals. Emergency departments must continue to educate providers on potential implicit biases that might affect their care decisions



No, authors do not have interests to disclose

301 Is the ANCOC Score Effective in Predicting Mortality Risk in Patients With Pneumonia?

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Background: The availability of a clinical scoring system that can swiftly and accurately predict the outcome of patients experiencing acute respiratory insufficiency due to pneumonia is crucial for emergency physicians to enhance clinical decision-making and elevate the quality of care provided to each patient. In March 2022, during the initial wave of the COVID-19 pandemic, we introduced the ANCOC score. This prognostic tool, analyzing five parameters (age, blood urea nitrogen, C- reactive protein, oxygen saturation, comorbidities), was adept at forecasting 60-day mortality risk in patients with acute respiratory insufficiency caused by SARS- CoV-2 infection, irrespective of vaccination status and viral variant. However, as we transition away from the pandemic, it has become evident that pneumonia and acute respiratory failure in emergency medicine departments can stem from various causes beyond SARS-CoV-2 infection. In these scenarios, the CURB-65 score has traditionally been utilized, estimating mortality risk for community-acquired pneumonia and aiding in decisions regarding inpatient versus outpatient treatment. Our study seeks to explore whether the ANCOC score, initially developed for COVID-19-related pneumonia, is applicable to all pneumonia cases and how it compares to the CURB-65 score.

Methods: We conducted a retrospective analysis of 461 patients (280 females and 141 males) admitted to our emergency department (ED) with a diagnosis of acute respiratory insufficiency. We gathered demographic data, comorbidities, immunization status, and various laboratory, radiographic, and blood gas parameters for all patients. Additionally, we documented treatment modalities administered and the necessity of oxygen therapy for each patient. Subsequently, both the ANCOC score and the CURB-65 score were calculated for every individual.

Results: In our multivariate analysis, various parameters were significantly correlated with an increased risk of mortality. These included male sex, advanced age, low systolic blood pressure, elevated urea levels, diminished Glasgow Coma Scale (GCS) scores, high serum LDH levels, and the presence of chronic obstructive pulmonary disease (COPD). Conversely, parameters significantly associated with an increased risk of admission to the intensive care unit included age, low PaO2/FiO2 ratio, low GCS scores, high LDH levels, elevated neutrophil-to-white blood cell ratio, and the presence of COPD as a comorbidity. To assess the accuracy of mortality prediction, we constructed receiver operating characteristic (ROC) curves. The area under the ROC curve was 0.672 for the ANCOC score and 0.708 for the CURB-65 score. No difference in accuracy between ANCOC and Curb-65 scores were found.

Conclusion: In an increasingly elderly and therefore fragile population, even a simple pneumonia can have deleterious effects. Consequently, it is imperative for emergency physicians to utilize scoring systems that can rapidly and accurately predict mortality risk in order to provide the right attention and the most appropriate treatments from the first moment in the emergency department. While the ANCOC score demonstrated a high degree of similarity to the CURB-65 score in predicting mortality risk among patients with acute respiratory failure, it did not exhibit sufficient performance to warrant immediate adoption in clinical practice.

No, authors do not have interests to disclose

302 Evaluation of a Cellular Host Response Test for Risk-Stratifying Patients Presenting to the Emergency Department With Signs or Suspicion of Urinary Tract Infection

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Study Objectives: Urinary tract infections (UTIs) are a leading cause of bacterial infections in the US and account for a significant portion of antibiotic consumption and healthcare costs. UTIs occur across a broad spectrum of disease from uncomplicated lower UTI to pyelonephritis, and sepsis. These infections are difficult to accurately diagnose due to the high rates of asymptomatic bacteriuria (ASB) and nonspecific symptoms such as altered cognition. In this study, we evaluated the potential of a novel cellular host response test to risk stratify patients with suspected UTI for localized UTI, sepsis, or no infection.

Methods: The cellular-host response test evaluated in this study is a semi-quantitative in-vitro test that uses deformability cytometry to assess leukocyte biophysical properties from whole blood in <10 minutes. The test generates the IntelliSep Index (ISI), a single score between 0.1 and 10.0, stratified into 3 interpretation bands (Band 1, Band 2, Band 3) that represents the probability of the clinical syndrome of sepsis from low to high risk. Adult patients presenting to the ED with signs or suspicion of infection were prospectively enrolled at multiple US sites (Feb. 2016 – Oct. 2021). EDTA-anticoagulated blood was assayed, and patients were followed by retrospective chart review. Presence of infection and organ dysfunction were confirmed through blinded retrospective physician adjudication. This population was subsampled to those suspected of UTI as detailed in the Figure. Within this cohort, we evaluated risk stratification performance and resource allocation potential of the test through trend analysis across interpretation bands.

Results: The 399 patients included in the analysis were stratified by the ISI as 223 (55.9%) in Band 1, 97 (24.3%) in Band 2, and 79 (19.8%) in Band 3. Comparing Band 3 to Band 1, an approximate 7-fold increase in blood culture positivity (27.8% Band 3, 4.0% Band 1, p<10-4), 2-fold increase in length of stay among survivors (medians 4.5 days Band 3, 2.0 days Band 1, p<10-4), 2-fold increase in maximum SOFA score within 3 days of enrollment (medians Band 1, 3.0 Band 3 and 1.5 p<10-4), 5-fold increase in all-cause 28 day mortality (13.9% Band 3, 2.7% Band 1, p<0.001), and a 9.5-fold increase in infection-associated mortality (0.4% Band 1, 3.8% Band 3, p<0.05) were observed. Finally, though rates of antibiotic administration increased from Bands 1-3 (44.1% Band 1, 74.4% Band 3, p<10-4), patients in Band 1 (low-risk population) comprised 49% of all patients who were administered antibiotics. Given the short length of stay, and low risk of mortality in Band 1, there may be an opportunity to safely reduce antibiotics in this large group of patients.

Conclusion: Our findings show that this cellular host response test may aid clinicians in risk stratifying patients suspected of UTI with the potential to improve resource allocation during treatment and championing antibiotic stewardship initiatives.

Figure 1 Summary of inclusion criteria. 1545 patients were retrospectively enrolled from 5 studies from 2016-2021. Patients were matched to common enrollment criteria of 2+ SIRS criteria (with 1 being WBC or temperature) or order for a culture of bodily fluid, and, SARS-CoV-2(-) or not tested (N = 1196). This subset was downselected to patients that are non-infected or have single source genitourinary infections (N = 788), and finally were downselected to patients with a positive urinalysis (PUA) and/or urine culture ordered (N = 399). PUA was defined as UA being positive for nitrates, leukocyte esterase, bacteria, or white blood cell levels greater than 10 cells/μL.

Yes, authors have interests to disclose
Disclosure: Cytovale Inc.
Employee Cytovale Inc.
Disclosure: Cytovale Inc.
Employee Cytovale Inc.
Disclosure: Cytovale Inc.
Employee Cytovale Inc.
Disclosure: Cytovale Inc.
Employee Cytovale Inc.

303 Using a Standardized Sepsis Order Set Reduces Mortality

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Study Objectives: Sepsis is the single most costly hospital condition in the United States, and the emergency department (ED) is often the first line of sepsis identification and timely treatment. While standardized order sets have been shown to improve outcomes in many other conditions, only one study to date has explored the use of a standardized order set in sepsis. In 2018, our national health care system implemented a sepsis-related quality improvement initiative that included the creation of a standardized sepsis order set based on the suspected source of infection. The purpose of this study was to compare hospital mortality among patients admitted through the ED with sepsis when the standardized order set was and was not initiated.

Methods: This was a retrospective analysis of patients admitted through the ED to 77 hospitals across the United States between January 1, 2019 through December 31, 2023. Electronic health record queries were used to identify patients who had a sepsis discharge diagnosis code in the primary or secondary position based on the

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International Classification of Diseases 10th Revision (ICD-10). Additional variables extracted included patient demographics (age, sex, race/ethnicity), Elixhauser comorbidity index score, presence of severe sepsis (including septic shock), concomitant COVID-19 diagnosis (after February 2020), admission to the intensive care unit, and whether the sepsis order set was utilized. Our primary outcome measures were raw inpatient hospital mortality rate and risk-adjusted mortality. The risk-adjusted mortality compares observed vs expected mortality based on the Premier Inc (Charlotte, NC) CareScience (TM) Analytics Risk-Adjustment Methodology, and their QualityAdvisor Database that incorporates 16 variables encompassing clinical (eg, comorbidities, diagnosis), demographic (eg, age, sex) and other patient-related (eg, travel distance, payer type) factors.

Results: During the study period, 258,212 patients were admitted through the ED and received sepsis-related diagnosis: the sepsis order set was initiated for 125,168 (48%) and not initiated for 133,044 (52%). Patients with and without order set initiation were similar in terms of age (mean (SD): 66 (17) vs 64 (17) years), sex (48% vs 49% female), race (72% vs 73% white), and Elixhauser comorbidity index score (median (IQR): 42 (21-64) vs 41 (21-64)). Patients with order set initiation more frequently had a diagnosis of severe sepsis (39% vs 31%), but they were less likely to have a concomitant COVID-19 diagnosis (8% vs 12%). Intensive care unit admission was similar for the two groups (33% vs 35%). Unadjusted mortality was lower among patients with order set initiation (10.6% vs 13.2%; risk ratio: 0.80; CI 0.78-0.82). Risk-adjusted mortality was lower than expected among patients with order set initiation (0.90) and higher than expected among patients without order set initiation (1.06), with an adjusted mortality risk ratio of 0.85 (CI: 0.82-0.88).

Conclusion: For patients admitted through the ED, initiation of a standardized source-specific sepsis order set reduces hospital mortality in patients with sepsis. More research is needed to determine whether specific components of the order set drive this association, and to explore other outcome measures.

No, authors do not have interests to disclose

304 Prevalence of Sexually Transmitted Infections in the United States: A Trend Analysis

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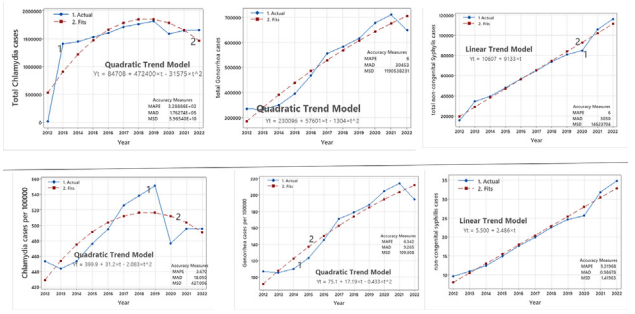
Study Objective: The current rates of sexually transmitted infection (STI) are a serious public health concern that requires critical attention and intervention. An estimate of emergency department cost for STI-related visits between 2016-2018 was $549,234,278. Without appropriate screening and treatment, STIs like chlamydia, gonorrhea, and syphilis can create serious and costly health consequences including progression of disease like tertiary syphilis or ascending infections including pelvic inflammatory disease, particular cancers, infertility, and congenital infection. We aim to assess national changes over time in the rates of chlamydia, gonorrhea, and syphilis (both congenital and non-congenital) infection among US adults.

Methods: This study utilized the CDC surveillance data for nationally notifiable STIs for federally funded control programs between 2002 and 2022, specifically identifying reported infections of chlamydia, gonorrhea, and non-congenital syphilis in the U.S. As most original data was categorical, descriptive analyses with number (%) were used to describe the trend and number of STI cases. Time series with trend analysis, using best fit measures were also used to depict the trend of STI cases between 2012-2022.

Results: There were a total of 22,525,607 cases of chlamydia, gonorrhea and non-congenital syphilis between 2012-2022. Chlamydia infection was most common 16,133,167 (72%), then gonorrhea infection 5,673,003 (25%). Similarly, chlamydia cases per 100,000 of population was 5,403 (73%) between 2012 and 2022, while gonorrhea cases were 1740 (24%) and non-congenital syphilis was 224 (3%). Time series with trend analysis showed that cases of chlamydia between 2012 and 2022 followed a downward quadratic trend, which was faster than a linear trend, with the highest point in 2019 (Figure A, D). These cases continued to increase since 2012 then decreased during the start of the COVID-19 pandemic. Similarly, cases of gonorrhea also followed a quadratic downward trend, although the highest point was 2021 (Figure B, E). In contrast, cases of syphilis were increasing linearly (Figure C, F) between 2012-2022.

Conclusions: Findings of this study suggest that sexually transmitted infections must remain a key public health priority; specifically, the rapid increase in syphilis cases signal an urgent need for intervention. These findings suggest an immediate need for re-evaluation of public health strategies and increased efforts in the realms of education and prevention. Emergency providers are uniquely positioned to address this public health crisis.



No, authors do not have interests to disclose

305 Accuracy of a Host Response Test for Diagnosis of Bacterial and Viral Infections and Prediction of Illness Severity in Emergency Department Patients Is Not Impacted by the Patient's Immune Status

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Study Objectives: Emergency department (ED) patients with suspected infections are common and have diverse diagnoses, severities, and co-morbidities. Specifically, immunocompromised (IC) patients are at high risk for developing severe disease and sepsis. We evaluated the accuracy of the TriVerity™ Acute Infection and Sepsis Test, a 29-mRNA host response test from blood to diagnose bacterial and viral infections and predict illness severity, in IC patients.

Methods: A multicenter, prospective clinical trial (SEPSIS-SHIELD) in EDs across the United States and Europe enrolled adult patients with suspected acute infection or suspected sepsis (NCT04094818). Whole blood was collected in PAXgene® RNA tubes. IC subjects included those with cancer, solid-organ and other transplants, HIV/AIDS, and other immunosuppression (autoimmune, steroids). TriVerity measured the expression of 29 mRNAs on the Myrna™ instrument which reports results via IMX-BVN/SEV-4 classifiers to generate three (bacterial, viral, and illness severity) scores in five discrete interpretation bands (very low, low, moderate, high, very high) in about 30 minutes. Bacterial and Viral score accuracy was evaluated against clinically adjudicated true infection status. Severity score was evaluated against the 7-day need for mechanical ventilation, vasopressors, and/or renal replacement therapy ("ICU-level care"). Sensitivity, specificity, and likelihood ratios (LR) were calculated for each band.

Results: Of 933 patients enrolled,149 were identified as IC. In an interim analysis, 144 of these IC patients (15%) had available severity endpoints, and 88 (9.4%) patients had available infection status (69 [78%] subjects were adjudicated as bacterial, 8 [9%] as viral, and 11 [13%] as non-infected). For the Very Low bands, the sensitivity of the Bacterial score was 96%; the sensitivity of the Viral score was 100%, and the sensitivity of the Severity score was 100%. The sensitivity of the Very Low bands in immunocompetent (NIC) patients was similar for the Bacterial (96%) score and lower for the Viral (95%) and Severity (93%) scores. For the Very High bands, the specificity of the Bacterial (89%) score and Severity (89%) were lower than the immunocompetent patients (Bacterial 96%; Severity 96%); while the specificities of the Viral (99%) scores were similar.

Conclusions: The TriVerity test (in development) utilizes host response to aid in the diagnosis of bacterial and viral infections and the prediction of illness severity. Preliminary results indicate the TriVerity test has high diagnostic and prognostic accuracy and is not affected by the patient's immune status.

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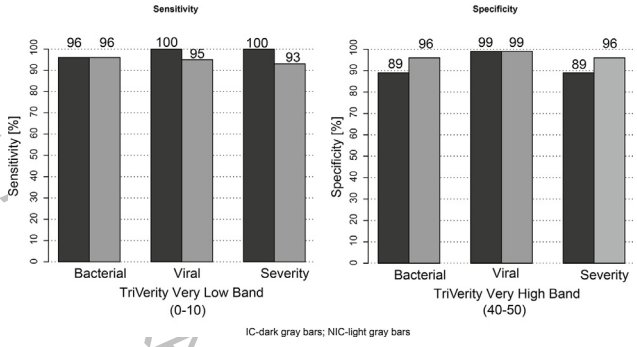
Figure 1. Sensitivity and Specificity of Bacterial, Viral, and Severity Scores in Immunocompromised (IC) and Immunocompetent (NIC) Patients



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306 NAD+ Metabolism Guides Temporal Variation in Macrophage Inflammatory Responses

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Study Objective: Various human diseases display time of day variation in severity and presentation. Animal models of sepsis similarly display time of day variation in severity depending upon time of insult. Myeloid cells such as macrophages are critical for many disease processes, including the early hyper-inflammatory responses seen in sepsis that drive organ dysfunction and death. It is possible that myeloid cells have time of day variation in inflammatory properties or function that may explain these temporal variations. We propose that temporal variation in cellular NAD^+ levels underlies variation in macrophage inflammatory response to endotoxin, independent of the canonical cellular circadian clock.

Methods: We utilized bone marrow derived macrophages (BMDM) isolated from wild type and BMAL1-knock out C57/Bl6 mice to study contribution of canonical clock to temporal variation in inflammatory responses. Cells were synchronized *ex vivo* to various times of day by serum shock technique. Cells were maintained in serum free media after serum shock. Cells were then treated with LPS at least 12 hours after last serum shock time point and samples were collected 6 hours post- treatment. Inflammatory response was measured by qPCR for cytokine expression and immunoblotting. BMDM isolated from RelA-luciferase reporter mice were utilized to measure canonical NF-kB activation at different times of day by luminescence assay. Cellular NAD^+ levels were measured by commercial assay. NAMPT expression was measured by qPCR and immunoblotting. Inhibition of NAD^+ salvage pathway was performed by FK866 treatment and NMN supplementation was utilized to increase cellular NAD^+ levels.

Results: Both WT and BMAL1-KO BMDM display time of day variation in inflammatory response to LPS stimulation as displayed by gene expression of common inflammatory cytokines, with peak in expression at ZT0. This correlates with increased NF-kB activation at these timepoints. Corresponding with this, timepoints with highest inflammatory response to endotoxin had highest intracellular NAD^+ levels as well as expression of NAMPT, the rate limiting enzyme of NAD^+ salvage. Finally, utilization of NAMPT inhibitor FK866 decreased cellular NAD^+ levels and blunted BMDM inflammatory response to LPS.

Conclusion: This study displays that BMDM display time of day variation to LPS stimulation that is independent of the canonical circadian clock, as indicated by temporal variation in LPS response in both WT and BMAL1 knockout cells. This time of day variation in inflammatory cytokine expression is at least partially driven by canonical NF-kB signaling, the major cellular inflammatory response system. Furthermore, BMDM intracellular NAD^+ levels similarly vary throughout the day, suggesting a contribution of an NAD^+ dependent process. Further highlighting the importance of NAD^+ to the inflammatory response, the NAD^+ salvage pathway inhibitor FK866 was able to potently block inflammatory cytokine expression, highlighting its potential as a therapeutic target in inflammatory disease. Future work will aim to elucidate the mechanism by which NAD^+ modulates inflammatory responses. NAD^+ is an essential co-factor for metabolic processes, post-translation modification and epigenetic regulation, which have all been displayed to influence inflammatory gene expression. We will also aim to determine if similar variation in myeloid cell function exists *in vivo* in sepsis models, with the goal of translating such findings to human patients. We anticipate that the results of this work will support the development of novel therapeutics for the prevention of early sepsis deaths in emergency department patients.

No, authors do not have interests to disclose

307 Artificial Intelligence-Enabled Escape Room Simulation for Patient Safety Education

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Study Objectives: The aim of this study was to replace the typical didactic and reference material-based patient safety curriculum with an artificial intelligence (AI)-enabled gamified simulation that incorporated problem solving, teamwork, and communication. We hypothesized that this format would appeal to both visual and kinesthetic learners and would provide significant educational value for this critically important topic.

Methods: Emergency medicine (EM) residents, Advanced Practice Provider EM fellows, and fourth-year medical students at an urban academic center participated in an escape room themed learning activity on patient safety. Topics were chosen from departmental peer review data and survey-based needs assessment including procedural complications, fall risks, dangerous medication interactions, patient safety terminology, cognitive bias recognition, and using the institutional safety reporting system. Learners did not have access to outside technology or references, but were able to use an AI assistant (customized GPT-4 (R) loaded with specific patient safety articles and textbook references) both to help identify key concepts and terms needed to solve the stations as well as to provide the final numerical combination to escape the room. Other gamification techniques employed included matching pairs, decoding an encrypted message, finding a secret code in invisible ink, and assembling a puzzle from pieces awarded at each station. A post-test was given after the initial session, and the topics and gameplay were adjusted accordingly. Topics where learners scored high on both pretest and post-test were removed. The gameplay was changed from larger groups with access to all 8 stations to smaller groups working sequentially through 4 stations to ensure all learners were exposed to each topic and educational intervention. A real submission of the simulated patient safety event to our institutional safety reporting system was added. Response frequencies were analyzed comparing pretest and post-test answers using Fisher's Exact Tests.

Results: 25 learners completed the initial escape room. Of those,10 completed the post-test. 17 learners completed the revamped escape room, and all 17 completed the pretest and post-test survey. Scores from each question were tallied and percentage of correct score were recorded from each question. Percentage of correct answers increased from 73.4% on the pretest to 83.7% on the final post-test ($p=0.0011$), and following the revamped escape room activity, confidence in ability to submit a patient safety report increased from 17.6% to 88.2% ($p<0.001$). Perceived educational value was 94%, and 100% of learners rated this activity more enjoyable than a traditional lecture or module.

Conclusion: AI-enabled gamification of topics typically taught in traditional didactic style resulted in improved learner satisfaction and retention of patient safety topics. Knowledge of the institutional reporting system and confidence in the ability to successfully submit a report was significantly improved. Incorporation of new AI technologies and gamification strategies can be a powerful tool in making engaging, educational sessions for EM learners.

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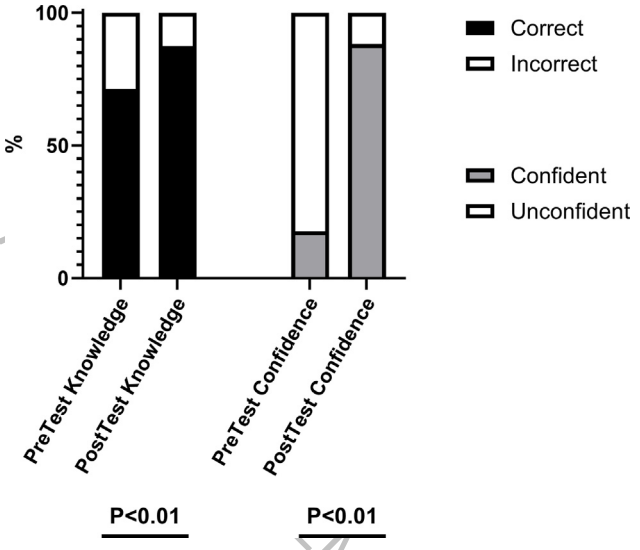

No, authors do not have interests to disclose

308 Provider Documentation of Patient HEART Score Following Implementation of a Non-Disruptive EHR-Driven Support Tool

Weiss M, Katz R, Boccio E/Memorial Healthcare System, Pembroke Pines, Florida, US

Background: The HEART score is a clinical support tool which allows providers to stratify the 6-week risk of a major adverse cardiac event for patients presenting to the emergency department (ED) with chest pain of suspected cardiac origin. Patients are classified as low, moderate, or high risk, and the classification allows the emergency medicine provider to make informed decisions regarding therapeutic management, resource utilization, and disposition. The manual addition of the HEART score to clinical documentation for undifferentiated chest pain was standardized across the healthcare system. The primary objective was to determine whether the implementation of a non-disruptive clinical support tool built within the electronic health record (EHR) to facilitate the calculation and inclusion of the patient HEART score changed provider documentation behavior.

Methods: A quasi-experimental study involving the retrospective analysis of pre-existing administrative data was performed. Patients presenting to one of six ED entities within a single health system in the southeast United States between July 1, 2023, and February 29, 2024, were screened for eligibility. Specific inclusion criteria included: 1) age $\geq$ 21 years, 2) electrocardiogram completed during ED length of stay, 3) troponin resulted during ED length of stay, and 4) International Classification of Disease 10th Revision (ICD-10) code suggesting cardiac cause of chest pain (R07.1, R07.2, R07.9, R07.81, R07.82, R07.89). Records with ED dispositions of left before treatment completed or against medical advice were excluded. ED provider notes were reviewed for documentation of a calculated patient HEART score. The HEART score tool was announced in October 2023 and implemented November 2023. Charts were divided into pre (July 1, 2023, through September 30, 2023) and post (November 1, 2023, through February 29, 2024) cohorts. The outcome HEART score documentation was categorized as a dichotomous variable. A chi-square test comparing documentation rates between pre and post cohorts was performed using SAS v9.4 (SAS Institute, Inc., Cary, NC).

Results: A total of 3,296 charts met eligibility criteria and were included in the analysis. HEART score documentation was observed in 540 of 1,574 (34.3%) and 1,382 of 1,722 (80.3%) ED provider notes within the pre- and post-implementation cohorts, respectively, and this difference was statistically significant ($p<0.001$).

Conclusion: Implementation of an EHR-driven clinical support tool is feasible and successful in improving HEART score documentation rates for patients presenting to the ED with chest pain of suspected cardiac origin.

No, authors do not have interests to disclose

309 Novel Addition of Point-of-Care Ultrasound to Medical Screening Exam for Obstetric Patients Reduces Time to Diagnosis of Ruptured Ectopic Pregnancy

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Background: Ruptured ectopic pregnancy is the leading cause of maternal mortality in 1st trimester pregnancy. Prior studies have shown use of point-of-care ultrasound (PoCUS) reduces time to diagnosis and treatment of ectopic pregnancy. Prolonged wait times and boarding in the emergency department (ED) delay care nationwide. At our institution, cases of delayed intervention for ectopic pregnancy prompted a quality intervention (QI) that incorporated PoCUS into the medical screening exam of pregnant patients (OBMSE). The objective of this study is to compare PoCUS utilization, time to diagnosis, time to intervention, and ED length of stay (LOS) before and after implementation of OBMSE for patients with ectopic pregnancy requiring surgical intervention.

Methods: This was a single center retrospective cohort study of patients found to have ruptured ectopic pregnancy and who received operative intervention between 1/1/2020 and 12/31/2022. During OBMSE, transabdominal transverse and sagittal views were obtained to evaluate for intrauterine pregnancy while right upper quadrant views evaluated for free fluid in Morrison's Pouch. PoCUS examinations were performed by mid level providers, residents, fellows, and attendings. Ultrasound systems used included Sonosite PX, Xporte, and M-Turbo. Patients diagnosed with ectopic pregnancy in the ED were identified by discharge diagnosis using International Classification of Diseases codes. Patients who underwent diagnostic laparoscopy for suspected ruptured ectopic pregnancy were included regardless of PoCUS documentation or performance. Patients diagnosed with non-ruptured ectopic pregnancy, intrauterine pregnancy, or pregnancy of unknown location were excluded. Data was abstracted from hospital records and confirmed by emergency physician reviewers. ED arrival time was recorded from the electronic medical record. The time of diagnosis was determined by placement of a gynecology consult order in the electronic health record. OR arrival was defined by the sooner of "in room" or "anesthesia start" times. Patients were grouped by those who presented prior to OBMSE inception on 7/12/2022 and those who presented after. Time from ED arrival to primary outcomes and descriptive statistics were calculated using Microsoft Excel.

Results: Sixty-one women required operative intervention for ectopic pregnancy prior to implementation of OBMSE and 38 after implementation. Median time to consultation was 3.7 hours prior to implementation and 2.9 hours after implementation ($p>0.05$). Median time to OR arrival was 8.5 hours prior to implementation and 7.2 hours after ($p > 0.05$). Median ED LOS was 7.5 hours before and 6.75 hours after implementation ($p>0.05$). Prior to implementation of the OBMSE process, 39% of women diagnosed with ruptured ectopic pregnancy had PoCUS performed compared to 63% after implementation ($p<0.05$).

Conclusion: This protocolized PoCUS OBMSE process was associated with a significant increase in PoCUS utilization and a statistically significant decrease in time to diagnosis of ectopic pregnancy requiring surgical intervention. The post-intervention group exhibited shorter median times to operative intervention and emergency department length of stay that did not reach statistical significance. In the context of the emergency department, the main objective for ectopic pregnancy is early diagnosis and appropriate consultation, which was improved by this QI process.

No, authors do not have interests to disclose

310 An Institutional Guideline With Clinical Decision Support Reduces Computed Tomography Use in Blunt Head Injury: Preliminary Quality Report

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Study Objectives: Computed tomography (CT) use in emergency departments (EDs) continues to rise despite the associated cost, radiation exposure, and operational inefficiencies. To safely decrease CT brain use in blunt head injury, the American College of Emergency Physicians has endorsed validated clinical decision rules, including the Canadian CT Head Rule (CCHR) and the Emergency X-Radiography Utilization Study (NEXUS) Head CT Rule. We aimed to develop an

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institutional CT guideline comprising these two rules and supported its implementation with provider education and clinical decision support (CDS) integrated within the electronic health record (EHR). Our primary aim was to decrease CT brain usage in blunt head injury.

Methods: This is a pre-post quasi-experimental study at three adult EDs within a single academic health system with approximately 190,000 combined annual visits. All consecutive encounters for patients aged 18 to 64 were included. ED dispositions of left without being seen or left before treatment complete were excluded. A subgroup of patients was defined by chief complaint categories likely to reflect a traumatic mechanism. The guideline was developed after convening institutional stakeholders from emergency medicine and trauma surgery, and a consensus was developed integrating the CCHR and NEXUS Head CT rules. The planned intervention consisted of brief, targeted educational sessions, publication of a workflow algorithm, and development of an EHR-integrated CDS tool. The intervention occurred over a 1-week period (1/17/24-1/23/24). Pre-intervention was 1/18/2023-1/17/2024. Post-intervention was 1/24/2024-4/1/2024. The CDS tool is optional and begins with shared exclusion criteria between CCHR and NEXUS. Clinicians then select a rule and complete the remaining criteria. Data from EHR data are automatically selected and flagged (eg, age, coagulopathy, GCS). CDS results automatically flow to the ED note. Categorical variables pre- and post- intervention were analyzed by chi-square analysis. Aims were further analyzed by plotting on XmR statistical process control (SPC) charts and assessed for special cause variation.

Results: 138,833 ED encounters were included for analysis. The percent of encounters age < 65 with any CT brain trauma study pre-intervention was 11.9%. The rate post-intervention was 10.7% ($p<0.01$). Excluding CT pan-scan orders, the rate of CT brain studies was 9.9% and 9.1% in the pre- and post- intervention periods, respectively ($p<0.01$). SPC analysis showed special cause variation immediately post-intervention for both groups. A subgroup of 16,078 patients was identified with traumatic mechanism chief complaints. Among this group, CT brain utilization was 50.1% pre-intervention and 47.4% post-intervention ($p<0.01$), however SPC analysis did not show special cause variation for this group.

Conclusion: Creating an institutional guideline supported by brief educational sessions and integrated CDS was associated with a reduction in the use of CT brain studies for patients aged 18 to 64. There was a weaker association for a subgroup of patients with chief complaints thought mostly to correspond to traumatic mechanisms. Further analysis will be needed to find how this subgroup differs from the general ED population. This quasi-experimental design is not able to assess causality and could be impacted by multiple unmeasured confounders including operational changes, seasonal effects, and other unknown covariates. These preliminary results show how tools commonly used for quality improvement can help design, implement, and measure an intervention to increase adoption of evidence-based CT stewardship.

No, authors do not have interests to disclose

311 Impact of a Best Practice Advisory on Reducing Duplicative ABO/Rh Testing in the Emergency Department

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Study Objectives: Estimates of vaginal bleeding during pregnancy range from 7-40%. Rhesus (Rh) (D) immune globulin (Rhogam®) should be administered to Rh-negative women anytime fetal and maternal blood mixing is suspected to lower the risk of alloimmunization. Rh status is assessed via a serum blood test (ABO/Rh), and an individual's Rh status does not change. The purpose of this study was to evaluate the effectiveness of an electronic health record Best Practice Advisory (BPA) in minimizing duplicative ABO/Rh testing for pregnant patients presenting to a high-volume emergency department network with vaginal bleeding.

Methods: A quasi-experimental study involving the retrospective review of patient medical records was performed. Patients presenting to one of six emergency department entities within a single health system in the southeast United States with an annual census of approximately 500,000 adult visits were screened for eligibility. An inline decision support, non-interruptive BPA was programmed in the Epic electronic health record system to alert clinicians about existing ABO/Rh test results when the vaginal bleeding in pregnancy Advanced Nursing Initiative was utilized. The BPA was implemented in December 2023. Subjects were divided into pre-BPA (January 1, 2023, through November 30, 2023) and post-BPA (December 1, 2023, through April 30, 2024) cohorts. The outcome, duplicative ABO/Rh testing, was defined as a dichotomous variable. Outcome success was met when an ABO/Rh serum blood test was ordered despite a previous ABO/Rh result available in the Epic electronic health record. Descriptive statistics were summarized, and a student's t-test comparing ABO/Rh duplicative testing rates between pre- and post- BPA cohorts was performed using SAS v9.4 (SAS Institute, Cary, NC).

Results: A total of 1547 duplicative ABO/Rh tests were performed during the study period. An average of 108 (95% CI: 99.1-117) and 72 (95% CI: 63-80) duplicative ABO/Rh tests were ordered during the pre- and post-BPA periods, respectively, reflecting a 34% reduction in duplicative test ordering. This difference in duplicative ABO/Rh testing between pre- and post-BPA cohorts was statistically significant ($p<.001$).

Conclusion: The deployment of a targeted non-interruptive BPA within the Epic electronic health record system significantly reduced duplicative ABO/Rh testing. This initiative reinforces the utility of electronic health record alerts in optimizing patient care and offloading clinician cognitive workload while reducing unnecessary medical testing and associated costs.

No, authors do not have interests to disclose

312 Establishing a Model of Both Asphyxia and Sudden Cardiac Arrest to Determine Post-Arrest Neurologic Injury

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Study Objectives: Sudden cardiac arrest (SCA) is devastating and affects more than 350,000 individuals. Although rates of return of spontaneous circulation (ROSC) are improving, survivors may face devastating neurologic dysfunction due to damage to the blood brain barrier (BBB) secondary to ischemic injury. Maintaining BBB integrity may lead to improved neurologic outcomes. Gap junctions and their main protein, connexin 43 (Cx43) have been shown to be critical for BBB preservation. We recently demonstrated that SCA increased systemic proinflammatory cytokines and decreased the gap junction protein Connexin 43 (Cx43) at the BBB with associated disruption in a model of VF arrest. However, systemic inflammation is likely greater during an asphyxia arrest, and its effect on GJs at the BBB is unknown. Our objective is to establish that post-arrest neurologic dysfunction in both SCA and asphyxia arrest is elicited by neuroinflammation and BBB disruption, which results from impaired gap junction channels (GJC) and opening of hemi-channels (HCs) at the BBB.

Methods: All experiments were approved by the Institutional Animal Care and Use Committee. We utilized a model of SCA and asphyxia arrest in Sprague-Dawley rats (300-500g). Anesthesia was induced with isoflurane and rodents were intubated. In the SCA group, rodents underwent rapid electrical pacing, via an esophageal electrophysiologic catheter. Rapid electrical pacing was performed until ventricular fibrillation or pulseless electrical activity occurred; ventilation was turned off at the time of arrest initiation. In asphyxia group, isoflurane was increased, and the ventilator was turned off resulting in PEA. In both groups, rodents remained in arrest for 4-6 minutes and were resuscitated using Advanced Cardiac Life Support (ACLS). Animals were placed into three groups: Asphyxia (n=3), SCA (electrically stimulated with no ventilation, n=3) or Sham (group underwent the initial procedure but no arrest, n=9). After either 1 hour or 6 hours the rodents were euthanized, and tissue collected. Systemic inflammatory response was quantified using ELISA to measure the proinflammatory cytokine IL-6 and TNF-alpha. BBB integrity was measured using Texas Red (3kD). Endothelial and astrocyte Cx43 at the BBB in the hippocampus was identified using immunohistochemistry and confocal microscopy Colocalization of Cx43 within the endothelium and astrocytes was performed using Huygens software (Scientific Volume Imaging, Netherlands). Additionally, hippocampal Cx43 was quantified using Western blot analysis. Statistical analysis was performed using t-test for continuous variables.

Results: The hemodynamic data (SBP, DBP, HR, SpO2) were similar between groups. Arrest characteristics such as number of rounds of ACLS, amount of epi given, and number of defibrillations were not statistically significant. The total arrest time differed between the asphyxia group (6.74 ± 1.01 minutes) (11.2 and the SCA group (11.27 ± 2.28 minutes, $p<.04$). This time difference may be due to electrical induction of the SCA group. Neurologically, both arrest groups suffered a significant infarct with the rodents being unresponsive to most external stimuli and in a stuporous state. The plan is to analyze the data for the ELISA, immunohistochemistry, and confocal microscopy to measure the systemic inflammatory response and the colocalization of Cx43 within the BBB.

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Conclusion: Our lab has successfully established both an asphyxia arrest model and SCA model to determine the effect of potential pharmacologic therapies on systemic inflammation on BBB disruption after cardiac arrest. Additional data is being collected and analyzed to determine the levels systemic inflammation, quantification of BBB disruption and Cx43 localization that will determine potential future pharmacologic interventions.

No, authors do not have interests to disclose

313 Alternative Chest Compression Techniques for Small Rescuers Generate Sufficient Chest Compression Depth

Okumura T, Sato J, Tessmer E, Len K, Yamamoto L/University of Hawaii John A. Burns School of Medicine, Honolulu, Hawaii, US

Background: Effective CPR requires rescuers to use their body weight to provide sufficiently deep chest compressions for a prolonged period of time. Young/small children are unable to perform effective chest compressions due to their weight. Currently, there is no alternative CPR method for those who are too small. The purpose of this study is to assess the effectiveness of conventional and alternate chest compression methods performed by small children.

Methods: This study enrolled subjects ages 5-15 years old and taught them to perform standard CPR chest compressions using an American Heart Association instructional video. Subjects' gender, age, weight, and height were recorded. Chest compression rate, depth, and release on a manikin were measured electronically for 2 minutes using chest compression depth sensing defibrillator pads. Those unable to successfully perform conventional chest compressions were taught alternative methods of jumping and squat bouncing on the manikin's chest.

Results: 114 subjects ages 5-15 have been enrolled. There was a significant positive correlation between subject weight and compression depth ($R^2 = 0.3445$). A transitional zone (TZ) or the weight range at which subjects were unable to perform sufficient conventional compressions was identified. Generally, subjects weighing less than 57.3 lbs or 26 ± 2-3 kg were unable to perform sufficient conventional compressions. However, all the subjects who failed conventional compressions could perform sufficient compressions using the alternative methods of jumping (while standing on the manikin's chest) and squat bouncing (while sitting on the manikin's chest).

Conclusion: Conventional chest compression efficacy declines significantly below (57.3 lbs/26 kg) but those who could not provide sufficient conventional chest compressions could perform sufficient compressions using jumping and squat bouncing potentially providing these children with a means of chest compressions while awaiting ambulance arrival.

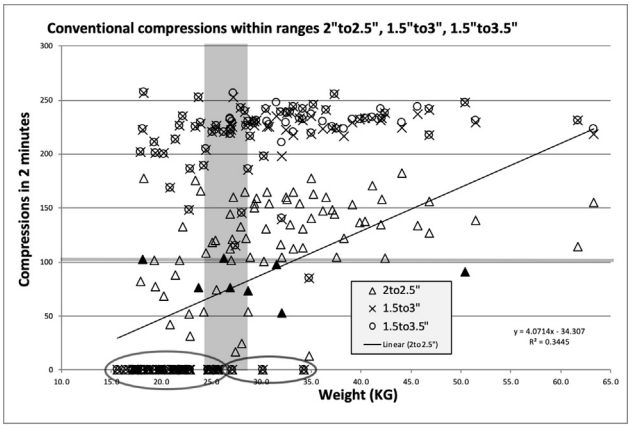

Figure 1. Chest compressions provided in 2 minutes (Y-axis) by small rescuers at different weights (X-axis). Triangles are total 2 to 2.5-inch depth (optimal) compressions delivered in 2 minutes. X and O symbols graph total 1.5 to 3-inch depth and 1.5 to 3.5-inch depth compressions delivered in 2 minutes, respectively. This image shows that subjects less than 26 ± 2-3 kg (demarcated by vertical grey zone) were unable to perform sufficient conventional compressions (sufficient number of compressions = 105; demarcated by horizontal grey line). Linear regression analysis showed that there is a positive correlation between weight and compression depth ($R^2 = 0.3445$).

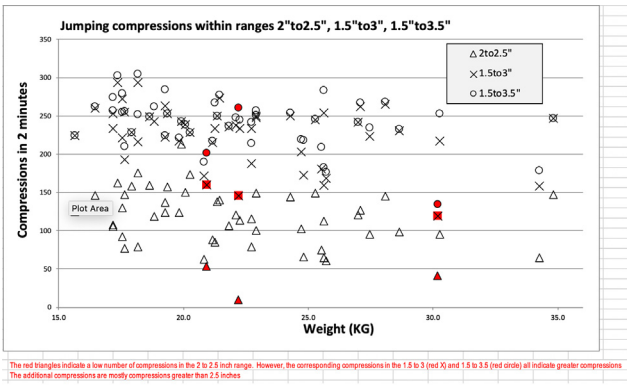

Figure 2. These are subjects who failed to perform sufficient conventional compressions. Using the jumping on the chest method, half of the subjects provided less than 100 compressions in the 2 to 2.5 inch range, but all subjects provided >145 compressions in the 1.5 to 3 inch depth range, and 200 or more compressions in the 1.5 to 3.5 inch depth range.

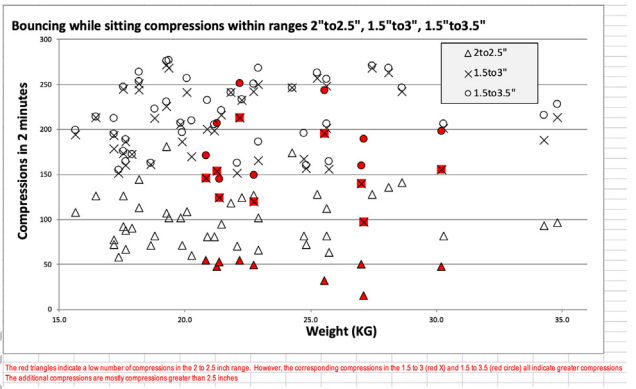

Figure 3. These are subjects who failed to perform sufficient conventional compressions. Using the squat bouncing on the chest method, most of the subjects provided less than 100 compressions in the 2 to 2.5 inch range, but nearly all subjects provided >150 compressions in the 1.5 to 3 inch depth range, and all subjects provided more than 150 compressions in the 1.5 to 3.5 inch depth range.

Yes, authors have interests to disclose
Disclosure: LifeScience Resources
Employee
LifeScience Resources

314 Mechanisms of VT/VF Rearrest After Out-of-Hospital Cardiac Arrest

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Study Objectives: Cardiac rearrest after return of spontaneous circulation (ROSC) increases mortality, making it a high priority for emergency care research. Our aim was to identify mechanisms underlying rearrest due to ventricular tachycardia/fibrillation (VT/VF). Given that close-coupled, narrow complex premature ventricular contractions (PVCs) have been implicated in triggering ischemic and idiopathic VT/VF, we investigated PVC characteristics and associated arrhythmia substrates underlying VT/VF rearrest.

Methods: *Design:* Observational Clinical Trial and Controlled Experimental Investigation. *Setting:* Prehospital and Laboratory. *Subjects:* 1) Adult emergency medical services (EMS) patients with out of hospital cardiac arrest due to VT/VF and ROSC were enrolled. Features of the ECG, including heart rate (HR), T Wave metrics, and PVC characteristics (frequency, duration, coupling intervals) were analyzed from 60 segments of continuous prehospital ECG tracings from 8 VT/VF

rearrest and 16 no rearrest controls. The control group was matched 2:1 based on age, sex, VT/VF primary arrest rhythm, and cardiac etiology of arrest. 2) Anesthetized pigs (n=6), with acute myocardial infarction, cardiac arrest with ROSC, and VT/VF rearrest were instrumented with an ECG and intracardiac electrograms to determine PVC characteristics and arrhythmia mechanisms. Groups were compared using Student's t-test for continuous variables and Fisher's exact test for categorical variables.

Results: Patient demographics, comorbidities, and arrest characteristics (including time from arrest to ROSC, bystander CPR and EMS administration of ACLS drugs) were not different between groups. However, ED administration of epinephrine, amiodarone, and defibrillation were more common in the rearrest group (all $p<0.01$). Acute coronary syndromes, percutaneous interventions, and survival were common and similar between groups (p=ns). PVC burden was similar in rearrest vs control patients (3 vs 4 PVC/min, p=ns) and PVCs initiated VT/VF rearrest in >90% of occurrences. The frequency of close-coupled (<350ms), narrow complex (<120 ms) PVCs was similar (p=ns) and common in both groups. Interestingly, in the rearrest group, HR was slower (82±26 vs 107±30 beats/minute, $p<0.005$) and time from peak to end of the T wave (a marker for repolarization heterogeneities) was greater ($p<0.04$). In pigs with VT/VF rearrest initiated by PVCs, intracardiac repolarization heterogeneities were greater (by 86%, $p<.03$) when a PVC initiated VT/VF vs when PVCs did not initiate VT/VF rearrest. As was observed clinically, there were no differences in any characteristics of PVCs which initiated VT/VF vs those that did not (all p=ns).

Conclusion: After ROSC from VT/VF, PVCs are common and frequently initiate rearrest; however, PVC characteristics are similar in patients who rearrest and those who do not. These data suggest that slower HRs promote heterogeneous repolarization, a known substrate for arrhythmias, which increases susceptibility to VT/VF initiated by PVCs. Markedly enhanced repolarization heterogeneities evolved after ROSC in a translational pig model of cardiac arrest when PVCs initiated VT/VF, providing direct evidence that this underlies susceptibility to VT/VF rearrest induced by PVCs. Improved awareness of factors predicting VT/VF rearrest and targeted therapies to mitigate post-ROSC arrhythmia triggers (PVCs) and substrates (repolarization heterogeneities) warrant further investigation.

No, authors do not have interests to disclose

315 Right Ventricular Dilation in Out-of-Hospital Cardiac Arrest Patients Evaluated With Transesophageal Echocardiography: A Resuscitative Transesophageal Echocardiography Collaborative Registry (rTEECoRe) Study

Owyang C, Kim J, Burns K, Prager R, Kaviyarasu A, Sands N, Abella B, Teran F/New York Presbyterian Hospital-Weill Cornell Medical Center, New York, New York, US

Study Objectives: Right ventricular dilatation (RVD) has been described both during and following resuscitation from out-of-hospital cardiac arrest (OHCA). While in some cases it is believed to represent a temporary increase in RV pressures due to blood pooling in the venous system, persistent RV failure has been associated with worse outcomes in OHCA survivors. We sought to describe the prevalence of RVD in patients evaluated with transesophageal echocardiography (TEE) intra and post resuscitation from OHCA.

Methods: We performed a retrospective analysis of prospectively collected data between January 2021 and April 2024 from adult OHCA patients evaluated with TEE in 23 emergency departments participating in the Resuscitative Transesophageal Echocardiography Collaborative Registry (rTEECoRe). We included all patients evaluated intra arrest and post arrest with collection of RV data. Our primary outcome was the finding of RVD reported by the clinician performing the TEE. We compared characteristics for the intra and post arrest cohorts and conducted multivariable logistic regression to explore the association between RVD and baseline demographics, as well as several variables we thought could influence the development of RVD including type of CPR and ventilation strategy, time from arrest to initiation of CPR (downtime), epinephrine doses, arrest rhythm, and training level of the TEE operator.

Results: From 293 patients included in the analysis, 272 (93%) had intra-arrest and 21 (7.2%) had post arrest TEE evaluation and available RV data. Median age was 62 (49, 72) years and 30% were females. 37 (14%) of patients evaluated intra-arrest and 5 (12%) of those evaluated post arrest had reported RVD. After multivariable adjustment, RVD was more likely to be found post arrest compared to intra arrest in patients with OHCA (OR 4.10 [95% CI, 1.00-16.3]). RVD was also significantly more common in females compared to males (OR 2.9 [95% CI, 1.21-7.12]). We found no association between RVD and all other cardiac arrest variables including other patient characteristics, downtime, initial rhythm of arrest, resuscitation interventions, type of CPR, or level of TEE operator.

Conclusion: In this cohort of OHCA patients, we found higher likelihood of RVD when TEE is performed post-arrest compared to intra-arrest. Further characterization of the time course of RVD and impact in clinical outcomes is warranted to understand the implications of this finding for decision making during OHCA resuscitation.

Yes, authors have interests to disclose

Disclosure: Chair, Scientific Oversight Committee The Resuscitative TEE Collaborative Registry (rTEECoRe)

Scientific Study/Trial

Chair, Scientific Oversight Committee The Resuscitative TEE Collaborative Registry (rTEECoRe)

Disclosure: National Institutes of Health (NIH) / National Heart, Lung and Blood Institute (NHLBI) K23 HL165150

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Disclosure: Course Director, The Resuscitative TEE Workshop

Other

Course Director, The Resuscitative TEE Workshop

316 Life or Death Decisions: Understanding Public Perception of Cardiopulmonary Resuscitation in Emergency Departments

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Study Objectives: Emergency department (ED) patients and families grapple with the dilemma of choosing whether to proceed with cardiopulmonary resuscitation (CPR) and other medical interventions that could potentially prolong life. The objective of this research was to survey adults to determine their perceptions regarding CPR, specifically its probability of leading to survival.

Methods: Prospective written surveys were distributed at two academic medical centers in West Michigan during 2023. A validated survey was administered by trained researchers to a convenience sample of 1,000 non-critically ill patients and/or their families. Information included demographics, TV viewing habits, and 4 anchoring vignettes. The vignettes asked respondents to estimate the chance of recovery (using visual analog scales) following cardiopulmonary arrest in elderly and pediatric patients, in-hospital and out-of-hospital scenarios. Bivariate Pearson's correlations were performed to assess the association between the number of correct answers to the vignettes with age and the frequency of media exposure.

Results: Among the 1000 participants, the mean age was 38 years (range 18 to 87 years); 60% were female. Respondents watched an average of 19.8 +/- 11.3 hours of television/week. This included educational medical TV programs (59%) and TV fictional dramas (54%). CPR training was cited most often as a primary source of information concerning CPR (53%), followed by television (41%), friends or family with medical training (18%), personal experience (15%), and social media (14%). In the vignettes, participants consistently overestimated the success rate of CPR (66% predicted postcardiac survival) as well as long-term outcome (64% predicted a complete neurological recovery). There was no correlation between the number of correct responses and age, television viewing patterns, or internet use.

Conclusion: Most people surveyed overestimated the chances of recovery following CPR regardless of media exposure or CPR training. This places an extra burden on the emergency clinician as they must discuss decisions about the end of life with patients and family who will most likely be grossly misinformed about probable outcomes.

No, authors do not have interests to disclose

317 Strategic Initiatives to Manage a Pediatric Emergency Department With a Reduced Emergency Department Pediatric Resident Workforce

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Study Objectives: Changes made to the structure of our pediatric residency program resulted in a 33% reduction in the number of residents per emergency

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department (ED) shift. In response to this enforced reduction, several measures were initiated to maintain or improve patient throughput, patient satisfaction, and patient safety in the pediatric ED.

Methods: Since July 2022, methods to improve ED throughput included (1) development of a central operations center to coordinate transfers, direct admits, and room assignments, (2) having initial admission orders entered by the attending hospitalist 16 hours per day, and (3) creation of a vertical ED. In anticipation of the resident workforce reduction beginning July 2023, additional measures were initiated. They included ED controlled scheduling of visiting residents (non-pediatric residents) to better distribute residents across all shifts, increased rotation time in the pediatric ED by emergency medicine interns, expanded role of advanced practice registered nurses (APRNs) working in all areas of the ED, increased daytime vertical ED coverage, attendings and fellows seeing more patients independently, and a better awareness of flow by nursing staff. To determine the effectiveness of these interventions, we examined time to admission, length of stay (LOS), time to discharge, left without being seen (LWBS) rate, patient satisfaction (as measured by net promoter scores), and safety events between the first quarters of the academic years of 2022 and 2023.

Results: Controlling for differences in census with regression analysis, we were 50% more efficient in the time to admission in the first quarter of 2023 than 2022: the average number of patients meeting the 90-minute bed request to admit goal was 9.2% in 2022 vs 47% in 2023. See Figure. There was also a decrease in LOS and LWBS between 2022 vs 2023: 219 min and 10.9% vs 195 min and 2.2%, respectively. See Table 1. Time to discharge from the ED also improved from 219 min to 180 min, a decrease of 18%. Patient satisfaction as measured by promotor score increased from 55% to 69%. Between the first quarters of 2022 and 2023 there was an overall increase in voluntary safety event reporting in our department. Most of these reports were in the unclassified events area. Despite this increased reporting, there has been a decrease in near miss and precursor safety events by 16% and 8%, respectively, between the first quarters of 2022 and 2023. See Table 2.

Conclusion: Despite a reduction in resident staffing, we have continued to improve major patient throughput metrics and patient satisfaction scores while experiencing a decrease in the number of near miss and precursor safety events. This project is ongoing as we continue to face further resident workforce reduction in our pediatric ED.

Figure 1.

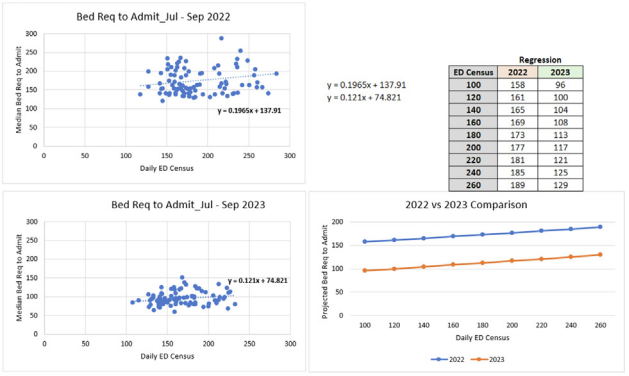

Table 1.

	Jul-Sep		
	2022	2023	Delta
Median LOS	236	195	-17%
LOS for Discharge	219	180	-18%
Avg. Daily Census	188	166	-12%
LWBS	10.9%	2.2%	

Table 2.

	2022	2023	% Change
Unclassified	99	180	82%
Near Miss	73	61	-16%
Precursor	83	76	-8%
Total	255	317	24%

No, authors do not have interests to disclose

318 Impact of Emergency Department Waiting Room Volunteers on Patient Satisfaction

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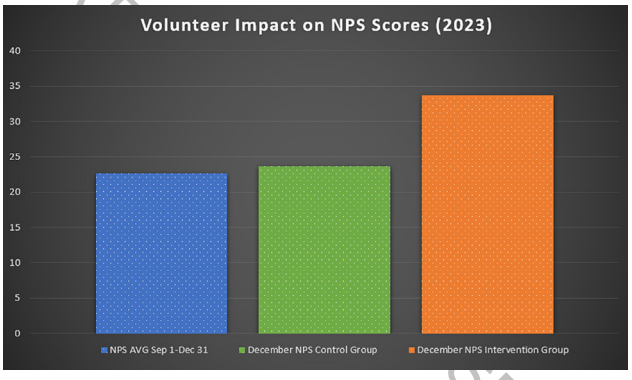
Study Objectives: Patient satisfaction has suffered at many emergency departments (EDs), including ours, due to high volumes and excess patient boarding, with care often stemming from the waiting room. Nonetheless, this crucial quality metric impacts everything from patient outcomes to reimbursement. Total Performance Score, which helps determine CMS hospital reimbursement through the Value-Based Purchasing Program, relies heavily (25%) on patient experience. We also know that satisfied patients are more compliant with return precautions and other care factors, influencing clinical outcomes. Previous literature further demonstrates that better staff communication and increased information sharing on ED arrival lead to direct improvements in patient satisfaction. Our aim was to similarly improve this metric at our institution by implementing a new volunteer program in the Adult ED Waiting Room. We hypothesized that with volunteers providing updates, patient comforts (blankets, phone chargers, etc), and answering questions about the visit, patient satisfaction scores would rise.

Methods: After an initial PDSA cycle in October 2022, a volunteer position went live in the ED waiting room at OHSU, an academic quaternary care center in Portland, Oregon. We initially analyzed all discharged patients' Net Promotor Score (NPS). After a subsequent PDSA cycle in December 2023, to better delineate the volunteer program's impact, we transitioned to tracking NPS scores in a retrospective cohort design, with patients who interacted with a volunteer serving as the intervention cohort and those who did not serving as a control. This was accomplished by adding a question regarding volunteer interaction on the NRC post-discharge survey. Absolute difference between the groups was used for analysis over a one-month period at the end of 2023.

Results: NPS data in December of 2023 showed scores of 33.7 (n=98) in the intervention group, compared with 23.7 (n=283) in the control. This 42.2% improvement was significant and likely attributable to the volunteer interaction.

Conclusion: An emergency department waiting room volunteer program aimed at improving information delivery and overall patient comfort led to sizable increases in patient satisfaction. We think similar effects can be achieved at other institutions, and future trials would be beneficial in confirming this suspected causal relationship.



No, authors do not have interests to disclose

319 Adopting the Human Factors Analysis and Classification System Into Emergency Medicine Morbidity and Mortality Rounds: A Quality Improvement Study at the Halifax Infirmary

Villa N, LeBlanc C/Dalhousie University, Faculty of Medicine, Halifax, Nova Scotia, CA

Study Objectives: This study assessed the integration of the Human Factors Analysis and Classification System (HFACS), adapted from the Royal Canadian Air

Force Flight Safety Program, into emergency medicine (EM) morbidity and mortality (M&M) rounds. The objective was to determine whether incorporating the HFACS could lead to a perceived increase in the overall quality of M&M presentations through the standardization of classifying cause factors of medical errors.

Methods: The study was conducted in four phases: 1: Adaptation of the HFACS from military aviation to a medical context; 2: Pre-intervention, eight EM residents were briefed on HFACS and its application in M&M presentations; 3: Intervention period, residents used the HFACS to present cases during M&M rounds; 4: Post- intervention surveys were distributed to M&M presenters and audience members to assess relevance, feasibility, quality, and acceptability.

Results: The integration of the HFACS was positively perceived across all outcome measures. Presenters and audience members rated cause factor identification as important (100%), indicating the relevance of HFACS in M&M rounds. Feasibility assessments showed a mean score of 4.25 out of 5, indicating favorable ease of use. The quality assessment mean score was 3.97 out of 5, indicating perceived improvement in cause factor identification. Presenters (62.5% Strongly Agree, 37.5% Agree) and audience members (73% Yes, 21.62% Undecided, 5.4% No) expressed acceptability and support for continued HFACS use.

Conclusion: Integrating HFACS into M&M rounds in the Department of EM was well-received and led to a perceived increase in the quality of cause factor identification. Both presenters and audience members endorsed the use of the HFACS, suggesting its desirability for sustained integration. The results of this study pave the way for future quality improvement research, including the adaptability of the HFACS across various medical departments and its potential to enhance cause factor classification in M&M rounds.

No, authors do not have interests to disclose

320 Optimizing Critical Lab Alert Callbacks in the Emergency Department: Reducing Interruptions and Improving Timeliness

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Study Objectives: Critical lab results, like hyperkalemia and hypoglycemia, can significantly impact patient outcomes if not addressed promptly. Thus, timely reporting is crucial for optimal patient care. Hospitals establish cutoff values for critical labs, prompting lab technicians to contact providers when results fall outside these limits. Studies have demonstrated that earlier notification of critical results in the emergency department translates to earlier interventions and patient disposition decisions. This project aimed to revise our existing critical lab alert callback protocol, prioritizing values with the greatest influence on acute clinical care. By focusing on clinically relevant values, we sought to minimize interruptions for both providers and lab technicians. We hypothesized that reducing call volume would lead to faster turnaround times between receiving results and contacting providers.

Methods: This project employed a multi-phased approach, fostering collaboration between various departments. While research on the interface between Emergency Medicine and Laboratory Sciences is limited, we addressed this gap by forming a multidisciplinary team. The team reviewed the existing critical lab list, prioritizing safety and clinical relevance. This included adjusting reference ranges for specific tests (eg, changing the glucose threshold from 30 mg/dL to 50 mg/dL for earlier intervention). Additionally, tests with limited clinical utility were removed (eg, hemolyzed specimens and high venous PO2). Following approval by the executive board, the revised protocol was implemented across all ED and inpatient settings (711 beds). To support this change, we provided in-service training for lab technicians, streamlined the callback process, and developed escalation protocols for situations when initial provider contact is unsuccessful. A comprehensive manual was also created to guide technicians on effective provider notifications.

Results: We examined a four-month post-implementation period and found total calls were reduced by 637 (3%) compared to the four months pre-implementation. A secondary outcome we are examining is the difference in average callback time pre- and post-implementation, although we have not been able to evaluate this outcome yet.

Conclusions and Implications: Our intervention has led to a significant reduction in non-critical lab alert callbacks, thereby minimizing provider interruptions and upholding patient safety principles. Future steps include surveying providers to see if this resulted in noticeably higher yield and actionable callbacks. Looking ahead, we anticipate that advancements in artificial intelligence integrated with electronic medical record software utilizing machine learning will play a central role in managing critical lab alerts.

No, authors do not have interests to disclose

321 An Analysis of Time to Completion of Contrast vs Non-Contrast Computed Tomography (CT) Scans Ordered in a Large Public Emergency Department

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Study Objectives: Emergency department (ED) wait times are a common cause of patient dissatisfaction and result in delayed interventions and treatment. Delays in imaging, particularly computed tomography (CT) scans, contribute significantly to overall wait times. In our study we analyze differences between contrast and non-contrast completion times for all CT scans ordered in a single ED. We also separately analyzed CT scans of the abdomen and pelvis (CT A/P) specifically due to their frequent use in ED evaluations of multiple complaints at multiple levels of acuity, and because they are not included in any of our expedited scanning protocols (ie stroke) making them an excellent indicator of the average patient experience. We aim to quantify the difference in time to scan completion between patients who did and did not receive IV contrast in order to better understand the impact that IV contrast use specifically has on CT scan completion time.

Methods: This is a retrospective, cross sectional chart review of all CT scans ordered in a single hospital's ED between March 2023 and February 2024. Studies were excluded if the recorded time of completion was before the order time (which was attributed to a data collection error). A sub analysis focused on CT A/Ps with and/or without IV contrast. CT A/Ps performed with and without contrast were classified as with contrast scans. CT A/P scans were excluded if the patient received any other type of contrast (oral, rectal, etc) or if the contrast bolus timing was performed as an angiogram as these studies have additional logistical requirements at our facility (IV gauge and placement).

Results: In the time period observed there were 38,359 CT scans performed. 15,729 scans were performed with IV contrast and 22,630 without. The mean time to completion was 2 hours 34 minutes for contrast scans and 1 hour 46 minutes for non-contrast scans. The average difference between contrast and non-contrast scans is 48 minutes, a 45% increase. In our sub-analysis, 5,940 CT A/P studies were performed with IV contrast and 2,255 performed without. The mean time to completion was 2 hours 53 minutes for contrast studies and 1 hour 44 minutes for non-contrast studies. On average, IV contrast administration added 1 hour and 9 minutes to the time required to obtain a CT A/P, a 66% increase.

Conclusion: Our data show that IV contrast use adds significantly to the time required to obtain a CT, particularly CT A/Ps. There is already a growing body of literature which demonstrates comparable sensitivity and specificity of CT A/P regardless of IV contrast use for a number of pathologies plus growing concerns and awareness of the risk of allergic reaction and inherent financial cost. Our study adds to that debate a quantifiable increase in time required when IV contrast is used. Going forward, physicians can add this time element to the list of other factors considered when deciding whether IV contrast use is necessary for their patients.

No, authors do not have interests to disclose

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322 Clean Cuts With Dirty Tools: Developing a Reusable Procedure Kit for Disaster Relief

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Study Objectives: In disaster relief and humanitarian relief missions, the emergency physician's role is critical in offsetting the surgical case volume by completing bedside procedures. A review of procedures in humanitarian relief missions over 4 years revealed common emergency department procedures as some of the most frequent cases: wound debridement, abscess drainage, and circumcision (12.1%); fasciotomy, and amputation of fingers or toes (9.2%); and drain insertion, chest tube insertion, and dressing changes (5.5%) were the 2nd, 4th, and 5th most common procedure categories. There exists a need for a versatile procedure kit with redundant methods for reusability in resource-limited settings. Given higher than typical surgical site infection rates in these environments, this study investigates different modalities of sanitization for the reuse of the proposed kit and traditional medical instruments when typical supplies begin to run low. While chlorhexidine (CHX) has been a standard for antiseptic treatment in hospitals, tablet-based sterilization methods such as tetraglycine hydroperiodide (Gly4I) and sodium dichloroisocyanurate (SDIC) have historical significance dating back to World War I, and their application extends to modern-day global health missions, military, and NASA operations. These methods are lightweight, compact, and already used in austere conditions to clean drinking water. This study assessed the efficacy of commonly carried water purification tablets (Gly4I and SDIC) as sanitizing agents for medical instruments, comparing them with conventional sanitization techniques.

Methods: Stainless and carbon steel surgical blades inoculated with E. coli were exposed to varying concentrations of chemical tablets alongside traditional and unconventional sanitization methods, to evaluate their sterilization efficacy. Our experimental approach involved testing 0.25%, 0.5%, 1%, 2%, and 4% CHX, 8, 10, 12, 14, 16, and 32 ppm of Gly4I, 4 - 8, and 16 ppm of SDIC, whiskey, vodka, and a 10% soap and water mixture. Bacterial growth after varying incubation times was quantified using optical density at 600 nm.

Results: Bacterial densities were analyzed using an ANOVA test with an α of 0.05, followed by a Bonferroni test with a modified α value of 0.00384 to identify significant differences across pairs. Findings indicated that higher concentrations of the SDIC and Gly4I tablets in solution were effective at sterilization at one hour and were not significantly different from each other or CHX in terms of performance. While similar in efficacy to soap and water, chemical means displayed lower variance across all trials.

Conclusion: It is not unusual for supplies to run low and resupply shipments to be delayed, especially in disaster conditions. Thus, investigating alternative sanitation methods is critical to patient safety and procedural success. Applying water purification tablets for sterilizing instruments offers a promising and cost-effective solution to the prevalent issue of SSIs in austere settings. Additionally, the use of commercial alcohol products in emergency and austere conditions yields an unconventional yet promising sanitization method if no alternative is available. The WildOR is a novel, portable device intended to sanitize, store and display all of the equipment needed to perform bedside procedures. Coupled with such a system, this experimental approach could maximize the use of equipment in disaster relief and other resource-limit settings, significantly reducing the risk of SSIs. This experiment was limited by simple E. Coli strains that are not typical of common wound/skin flora, however polymicrobial inoculations and animal tissue experiments are ongoing as follow-up experiments to further validate these methods. That said, these findings suggest that water purification tablets could serve as a reliable sanitization method in settings where conventional facilities are unavailable.

No, authors do not have interests to disclose

323 Do Disaster Drills Impact Real-Time Patient Care in the Emergency Department?

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Study Objective: Mass casualty events (MCIs) challenge hospitals and especially the emergency departments (EDs) to manage their resources efficiently while providing urgent care to a large number of victims. The Joint Commission on Accreditation of Healthcare Organizations as well as governments worldwide require hospitals to conduct drills to ensure their EDs are prepared for such events. Drills are complex exercises as they require many resources from the ED. In studies conducted in pediatric EDs, it was found that drills had no negative impact on the medical treatment and waiting times of real-time patients. To the best of our knowledge, no previous study has been conducted to examine the impact of these quality of patient care measures in an adult ED. The aim of our study was to examine the impact of drills on patient care in a large-scale adult ED.

Methods: A retrospective study of eight emergency disaster drills conducted in the adult ED of Shamir Medical Center (SMC), including four surprise afternoon drills and four planned morning drills. Quality of care data regarding the study's patients was obtained from the medical center's computerised system. The case group consisted of patients who arrived or were already in the ED at the time of the drills. The control group consisted of patients who visited the ED on the same day as the drills, one and two weeks prior to and following the drills.

Results: The case group consisted of 585 patients and the control group 2,447 all of whom had similar characteristics. There was no statistically significant difference between the quantitative measures of the two groups; LOS, number of patients admitted/discharged, in-hospital mortality, readmission to ED etc and between the sequential variables of both groups; ED waiting times. In addition, we examined a sub-group of 215 patients who visited the ED during the drill (excluding patients who arrived before the drill but were still present during) with a control group of 906 patients. We found a statistically significant difference in the average triage level given, with 68 percent of the control group being triaged with a level ranging from 1 to 3 whilst only 63 percent of the case group was given these triage levels (P=0.025). We also found that the average time-to-triage was five minutes longer in the case group, 15.8 minutes as opposed to 20.6 minutes, and a difference of three minutes in the median time, 11 minutes as opposed to 14 minutes (P=0.005). Furthermore, the average time taken for the administration of medical decisions, admission or discharge, was 14 minutes shorter in the case group, 59.1 versus 73.1 minutes (P=0.022). When examining the patients who visited the ED specifically during a surprise drill, we found that the average time-to-triage was 31.0 minutes, six and a half minutes longer than the 24.5 minutes in the control group and the median time almost doubled from 16 minutes to 30 minutes in the case group (P=0.01). Similarly, in this sub-group we also found the average triage level to be higher in the control group than in the case group, with 75 percent of the control group being given a triage level from 1 to 3 when comparatively only 54 percent of the case group was given these same triage levels (P=0.002).

Conclusions: We found that MCI drills, especially surprise drills, do have an impact on patient care, specifically, extended triage times and average triage level. These findings may be crucial, and should be taken into account when planning resource management (eg, human resources) to ensure that real time patient care in the ED during drills is not compromised.

No, authors do not have interests to disclose

324 Detection of Extremity Compartment Syndrome Using Ultrasound-Based Shear Wave Elastography: A Non-Invasive Tool for Triage of Extremity Injuries in a Mass Casualty Event

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Background: Severe extremity trauma can occur frequently in mass casualty disasters such as earthquakes and building collapse. Extremity injury complicated by compartment syndrome (CS) is a surgical emergency where early and accurate diagnosis significantly improves morbidity and mortality. A missed diagnosis can result in long term disability and increased mortality rates. A misdiagnosis can result in unneeded surgical fasciotomy. To diagnose CS clinicians must rely on clinical signs that are often subjective. Needle based compartment pressure measurements can be used for diagnosis but are painful and suffer from poor sensitivity, specificity, and inter-operator reliability. With over 500,000 evaluations for CS and 50,000 fasciotomies performed annually in the U.S., an improved CS diagnostic is needed. Ultrasound-based shear wave elastography (SWE), a non-invasive measure of tissue stiffness, has been reported to be associated with muscle compartment pressure and CS in animal models.

Study Objective: The objective of this study was to assess the performance of SWE to detect CS in patients with acute extremity injury.

Methods: We performed a prospective, observational pilot study at 4 trauma centers to assess the performance of SWE to detect CS in adult patients with acute extremity injury undergoing evaluation for CS. A Philips EPIQ (Bothell, WA) ultrasound system with an eL18-4 linear transducer was used to acquire 2D and SWE

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images of proximal and distal injured extremity compartment(s). SWE images of a subject with severe trauma and CS in the right leg and uninjured left leg is shown in the Figure. SWE measurements were performed post-hoc by two physician investigators blinded to patient data. No investigational results were available to the treating clinical team. The attending MD made a positive or negative clinical diagnosis of compartment syndrome using symptoms, physical exam and needle pressure measurement when felt to be indicated by MD (one patient). A study diagnosis of CS was made by 2 independent physicians, blinded as to the SWE data, by retrospective review of the clinical data that included history and physical determinants of CS, imaging studies, needle compartment pressure measurement, surgical observations and stimulated contraction of muscle tissue at fasciotomy.

Results: 35 subjects (18-80 years old) were enrolled. Ten subjects (2 arm, 2 upper leg, 6 lower leg) were determined to have a positive clinical diagnosis of CS and underwent fasciotomy. 7/10 cases were confirmed at surgery to have a tissue diagnosis of CS-a true positive study diagnosis. In 3/10 cases undergoing fasciotomy, the tissue was observed as normal, negative for CS-a false positive study diagnosis. SWE measurements varied between 15 and 111 kPa. Using a threshold of 59 kPa for the determination of a CS diagnosis, SWE detected 6/7 true positive clinical CS cases. (sensitivity 0.86, 95% confidence level (CI) 0.60 to 1.12). For subjects (n=25) with a negative study diagnosis of CS by independent clinician review, SWE was less than 56 kPa in 24/25 subjects. (specificity 0.96, CI- 0.88 to 1.04). The accuracy of using SWE to detect compartment syndrome was 94%.

Conclusion: In this prospective, multicenter pilot study, SWE exhibited high accuracy for the diagnosis of surgically adjudicated compartment syndrome. The non-invasive, painless, and repeatable nature of SWE imaging positions it to be become a valuable tool in assessment and triage of injured patients. A further larger study to define optimal rule-in and rule-out thresholds is warranted.

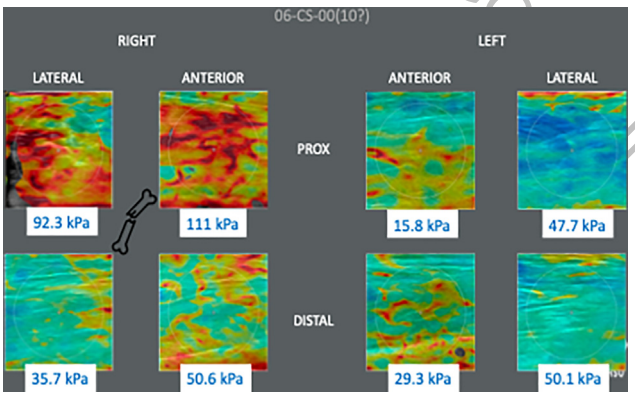

Figure: Motor Vehicle Accident Injuring Right Leg With Elevated SWE Values in Anterior and Lateral Compartments.

Yes, authors have interests to disclose

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BARDA-Biomedical Advanced Research and Development Authority

325 Medical Student-Led Community-Based Training Leads to Increased Self-Reported Confidence in Life-Saving Bystander Interventions

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Background: Bystander administration of cardiopulmonary resuscitation (CPR), hemorrhage control, and other emergency interventions have a positive impact on a patient's likelihood of survival. Many members of the general public have limited experience and low confidence in their ability to perform these interventions. However, traditional classes covering CPR and first aid are often inaccessible to community members due to their cost, geographic location, or language barriers. Outreach from volunteer organizations led by medical students can play an important role by teaching emergency medical skills. This study aims to evaluate the change in participants' self-reported confidence in providing emergency medical care before and after attending a free class taught by a medical student-led organization.

Study Objective: To prospectively analyze the impact of outreach classes led by a medical student organization on participants' self- reported confidence in applying prehospital skills such as CPR, choking intervention, naloxone and epinephrine administration, and hemorrhage control.

Methods: During an eleven month period between March 2023 and January 2024, participants completed a pre and post- intervention survey that assessed subjective levels of confidence using the Likert scale in the following skills: CPR, choking intervention, naloxone administration and epinephrine autoinjectors, and hemorrhage control. De-identified evaluation responses were then compiled and compared.

Results: Seventy-nine people completed the pre-class survey (n = 79) and eighty-five people completed the post-class survey (n = 85) regarding their confidence in performing these interventions via Likert Scale. Self-reported confidence in hemorrhage control rose from 2.23 to 4.58, with CPR administration rising from 2.69 to 4.55. Choking intervention increased in self-reported confidence from to 2.34 to 4.11 with autoinjectors rising from 2.04 to 4.55.

Conclusion: Early bystander intervention on the scene of a medical emergency can be life-saving. This unique medical student-led course in bystander emergency intervention training targets financial, geographic, and language-related barriers to prehospital healthcare education among underserved Chicago communities. Early findings from this organization's pre- class and post-class surveys demonstrate increased self-reported confidence in performing CPR, choking intervention, use of autoinjectors, and hemorrhage control.

Impact: Increasing knowledge and confidence in prehospital skills for medical emergencies has the potential to increase bystander action while lessening morbidity and mortality. Implementation of similar programs in other communities across the United States may improve outcomes and survival of out-of-hospital emergencies.

No, authors do not have interests to disclose

326 A Retrospective Chart Review of Patients Presenting With Heat-Related Illness to an Urban Health System in Phoenix, Arizona Over One Decade

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Study Objectives: Climate change has led to record temperatures, posing a severe and escalating threat to public health. The intense heat has led to a dramatic increase in heat-related illnesses and deaths. Factors such as age, socioeconomic status, and underlying health conditions contribute to susceptibility to extreme heat. However, a comprehensive analysis of patient characteristics among those affected by heat illnesses has not been performed. This vital research aims to inform targeted interventions, enhance risk stratification, and strengthen community resilience against extreme heat events.

Methods: A retrospective chart abstraction was completed between January 1, 2012 and December 31, 2022 among adults 18-89 years old presenting to a single hospital system in Phoenix, AZ with any discharge diagnosis pertaining to heat-related illness. Demographic and clinical characteristics were summarized in frequencies and compared among patients over time and in relation to climate data. Trends over time were analyzed and graphically juxtaposed.

Results: Patients with a heat-related diagnosis code had a mean age of 54, and were more likely to be male (79.5%), non-Hispanic (68.1%), and native American (8.9%) as compared to all ED presenting patients over the same time. Patients with a heat-related illness diagnosis often carried concomitant diagnoses of contact burns (37%), rhabdomyolysis (25%), and of substance use (16.7%). Common comorbid conditions included diabetes (10.8%) and cardiovascular disease (5.8%). Antipsychotics (20.0%) and SSRIs (16.7%) were relatively common home medications among heat-affected patients.

Conclusion: This study describes trends in patient characteristics among patients diagnosed with heat-related illness over a decade. This review serves as a comparator as heat illness becomes more frequent and heat events more severe. This work will guide strategy and future direction in surveillance and treatment of heat-related illness. Identifying common risk factors and patterns of exposure contributes to preventive strategies, including public health campaigns, urban planning initiatives, and community education programs.

No, authors do not have interests to disclose

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327 Stayin' Alive: A Retrospective Review of Patients Presenting for Medical Attention at Large-Scale Music Festivals

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Background: Music festivals are increasingly popular worldwide, bringing strain and challenges to emergency medical planning and response. Combining various music genres playing simultaneously at multiple stages creates a unique environment compared to traditional concerts. There is a paucity of data regarding the deployment of medical resources at these festivals, the frequency and types of problems encountered, interventions performed, or how festival-specific factors may influence these characteristics.

Study Objective: The goal is to identify the patient presentation rates (PPRs), transport to hospital rates (TTHRs) and to determine and compare the type and frequency of illness and injury at large scale music festivals. This study also aims to identify any effect of external factors (such as music genres, weather conditions, time of day, etc) on PPRs, TTHRs, and type/frequency of illness and injury.

Methods: A retrospective chart review was performed on all patients who presented for on-site medical attention at one of three large-scale music festivals in Illinois that occurred between May 2023 and August 2023. Additional data regarding weather conditions, music genres, and festival descriptors were obtained using public records. Associations between external variables and patient data were analyzed (p-value of less than 0.05 considered significant) using the Poisson model, the negative binomial model, and the generalized estimating equations (GEE model).

Results: Of the estimated 580,000 festival patients, 921 patient encounters were recorded (0.00159%). Patients evaluated were 55.7% male, with a mean age of 26 years (range 4-82 years), and 5.86% were transported. Patients presented with many different complaints, most frequently minor injuries (26.1%), alcohol intoxication (21.5%), and syncope (14.9%). Festivals had multiple different musical genres, and of the 921 patient encounters, 721 could be attributed to having occurred during a specific music genre. Of those, rock correlated to the highest number of chief complaints (34.0%), followed by EDM (28.0%) and pop (20.2%). Small festivals (less than 25,000 patrons) had higher PPRs compared to medium ($p<0.001$, Rate Ratio (RR) 10.97, 95% CI 8.63-13.94) and large festivals ($p<0.001$, RR 15.97, 95% CI 13.41-19.02). Festivals with camping had higher PPRs compared to non-camping venues ($p=0.0038$, RR 3.5, 95% CI 1.5-8.18).

Conclusions: Patients presenting for medical attention at music festivals represented a small percentage of total patrons, and mostly consisted of complaints that were managed entirely by onsite medical personnel. Few patients were transported out of the festival for further care. Visits encompassed multiple presentations and were more common in smaller venues and those offering camping. These results can help guide event directors for resource deployment at these mass gathering events.

No, authors do not have interests to disclose

328 Potentially Avoidable Transfers in the Trauma Registry

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Study Objectives: Inter-hospital transfers are an integral part of emergency care systems, but are resource-intensive and do not always result in patients receiving more advanced care. Factors influencing the decision to transfer patients who sustain traumatic injuries are based on resources at the referring facility, including operating room and intensive care capacity and access to surgical subspecialty care. Some level I trauma centers have specialty-specific "auto-accept" criteria, based on perceived likelihood of requiring a higher level of care, that allow referring providers to initiate an interfacility transfer without speaking directly to an accepting specialist at the referring hospital. However, some patients who undergo transfer may not receive any specialized resources. These potentially avoidable transfers (PAT) burden patients, families, and healthcare delivery settings including the emergency department (ED). In this study, we sought to describe how often ED-to-ED trauma transfers did not require Level I trauma center resources and which factors were associated with this outcome to better understand how health care system utilization can be improved.

Methods: This was a retrospective review of all patients sustaining traumatic injuries for which they were transferred to one Level I trauma center from 11/2021-5/2023, using electronic health record data. Transfers with length of stay (LOS) <=72h were also linked to the trauma registry. Inpatient-to-inpatient transfers and encounters missing an ED disposition were excluded. We defined PAT using broad (bPAT), intermediate (iPAT), and narrow (nPAT) criteria. Patients meeting bPAT criteria had LOS <=72h, did not receive an operative intervention, and received no or <24 hours of intensive care. Patients meeting iPAT criteria met all of the previous requirements with the addition of receiving no intensive care and no specialty procedure in the ED. Patients meeting nPAT criteria met all of the previous requirements with the addition of LOS shortened to <=48h and survival to discharge. We examined differences in rates of PAT by demographics, primary consulting service, and meeting auto-accept criteria, using univariate and multivariate logistic regression.

Results: Of 4,314 transfers, 67% met auto-accept criteria, 44% had LOS <=72h, and 18% were discharged from the ED. Transfers were most commonly for orthopedics (33%), general surgery (29%), and neurosurgery (16%) specialty evaluation. Of all transfers, 1,284 (29.8%) met bPAT criteria, 968 (22.4%) met iPAT criteria, and 425 (9.85%) met nPAT criteria. In multivariate analysis, transfer for oral surgery was predicted to 69.9% (95% CI 61.0-78.9) likelihood of meeting iPAT criteria, (95% CI 61.0-78.9), ophthalmology 62.1% (95% CI 56.6-67.7), and plastic surgery 50.5% (95% CI 38.1-63.0), compared to orthopedic surgery 8.05% (95% CI 6.61-9.49). Overall, auto-accepted transfers had 20.6% (95% CI 19.1-22.0) likelihood of meeting iPAT criteria (95% CI 19.1-22.0) compared to transfers not meeting auto-accept criteria 26.1% (95% CI 23.9-28.3). Neurosurgery auto auto-accepted transfers were more likely to meet iPAT criteria compared to neurosurgery transfers that were not auto-accepted, but this finding was not statistically significant.

Conclusion: We found that PATs for trauma were common and varied greatly based on the surgical service indicated for referral. These findings suggest that there is room for improvement in optimizing care for injured patients potentially requiring specialty care, though further research is needed to validate these findings using chart review and explore external factors influencing the decision to transfer a patient, including the impact of telehealth availability. Limitations include this study's single single-center and retrospective nature. Ongoing research is aimed at validating these findings using chart review. Though PATs are defined comparatively in existing research, further work is needed to determine whether trauma transfers are beneficial in ways beyond the scope that was not measured in this study.

	Total		Likelihood of Meeting Potentially Avoidable Transfer Criteria		
	n	%	*Broad Criteria (95% CI)*	*Intermediate Criteria (95% CI)*	*Narrow Criteria (95% CI)*
Age					
<18	476	11.0%	39.6% (35.7-43.6)	25.6% (22.2-29.0)	15.2% (12.4-17.9)
18-64	2357	54.6%	30.1% (28.4-31.9)	23.8% (22.2-25.4)	10.0% (8.99-11.1)
65+	1481	34.3%	25.8% (23.7-27.9)	19.1% (17.2-21.0)	7.10% (5.72-8.49)
Sex					
Male	2835	65.7%	30.5% (28.9-32.0)	22.9% (21.5-24.2)	9.92% (8.97-10.9)
Female	1479	34.3%	28.4% (26.3-30.6)	21.6% (19.6-23.6)	9.75% (8.31-11.2)
Race					
White race	3511	81.4%	29.8% (28.4-31.2)	22.3% (21.0-25.9)	9.76% (8.88-10.6)
Race other than white	803	18.6%	30.0% (27.2-32.9)	23.3% (20.7-25.9)	10.3% (8.54-12.0)
Service					
Orthopedics	1423	33.0%	11.4% (9.73-13.1)	8.05% (6.61-9.49)	2.42% (1.59-3.24)
General Surgery	1265	29.3%	29.4% (26.8-32.0)	20.3% (18.0-22.6)	6.51% (5.05-7.97)
Neurosurgery	691	16.0%	36.6% (32.9-40.2)	24.8% (21.5-28.1)	4.19% (2.66-5.72)
Ophthalmology	326	7.56%	68.3% (63.0-73.7)	62.1% (56.6-67.7)	40.9% (35.4-46.4)
Hand Surgery	325	7.53%	28.7% (23.8-33.5)	18.7% (14.6-22.9)	9.52% (6.50-12.5)
Oral Surgery	115	2.67%	76.2% (67.7-84.7)	69.9% (61.0-78.9)	40.6% (31.6-49.7)
Otolaryngology	78	1.81%	58.9% (47.7-70.1)	48.6% (37.4-59.8)	25.0% (16.0-34.0)
Plastic Surgery	62	1.44%	54.5% (42.0-67.1)	50.5% (38.1-63.0)	20.5% (11.3-29.7)
Vascular Surgery	12	0.28%	30.8% (5.26-56.2)	7.80% (-6.90-22.5)	6.96% (-6.32-20.2)
Urology	10	0.23%	42.6% (12.6-72.7)	16.3% (-4.76-37.4)	7.02% (-6.41-20.5)
Auto-accept Criteria					
Met auto-accept criteria	2874	66.6%	27.3% (25.8-28.9)	20.6% (19.1-22.0)	7.94% (6.88-9.00)
Did not meet auto-accept criteria	1440	33.4%	34.9% (32.4-37.3)	26.1% (23.9-28.3)	12.3% (10.8-13.7)

No, authors do not have interests to disclose

329 Do Emergency Physicians Need to Seek Urgent Urological Consultation for Renal Colic Patients With Larger Kidney Stones?

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Study Objectives: Practice guidelines and emergency medicine texts recommend that urgent urological consultation be considered for emergency department (ED) renal colic patients with larger (usually > 5 mm) stones because of concern that such stones will not pass spontaneously within an acceptable timeframe. We sought to find published data on how stone size affects the probability of spontaneous stone passage and how long it takes.

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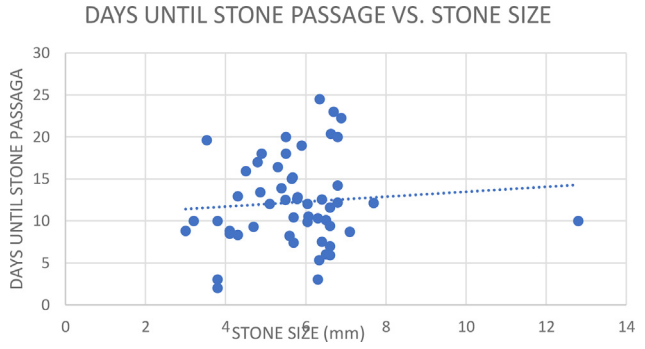
Methods: *Design:* Metaanalysis *Protocol:* We searched the Cochrane Collaboration (CENTRAL and the Registry of Systematic Reviews) and PubMed for the term, "renal colic" for randomized controlled trials (RCTs) and meta-analyses, without time limitations, but limiting the language to English. For the RCTs we chose those that included data on stone size and had a placebo arm. We searched the bibliographies of the systematic reviews for additional RCTs. We focused on RCTs of medical expulsion therapy (MET) since RCTs of analgesics generally did not include data on stone size. We excluded studies where outcomes were evaluated only after lithotripsy or ureteroscopy. Inclusion criteria were RCTs with data on at least one of the following: fraction of stones passed or time to passage (these criteria usually relied to some extent on patient self-reporting, which other studies have shown sometimes misses the stone passage). For a few RCTs, mean time to stone passage was extrapolated from graphical data in the report. In RCTs that divided stone size into two ranges, each range was included separately in the analysis. Using data from the placebo arm in each study, we plotted percent passage and time to passage vs stone size and generated a regression line for each graph.

Results: Search of PubMed and the Cochrane Collaboration along with bibliographies of 5 systematic reviews yielded 449 RCTs, of which 63 met inclusion criteria. Two papers divided patients into two stone size ranges, yielding a total number of 65 data sets. Publication dates were from 1994 through 2022, the studies were done in many countries, were studies of numerous MET agents, including tamsulosin, alfuzosin, silodosin and doxazosin, and, in most cases, patient enrollment was limited to those with stone size < 10 mm. The median stone size was 5.8 mm (interquartile range [IQR]: 4.8, 6.6 mm, range 2.0-12.8 mm), the median percent passage (over a time period up to 28 days; 64 data points) was 50% (IQR: 38, 58%; range 4-59%) and the median time to passage (53 data points) was 12 days (IQR: 9, 15 days, range 2-25 days). The graph of time to passage is shown in the Figure. Visual inspection of the graph and the regression line shows little change with stone size from about 3-8 mm and, incidentally, suggests that stones < 3 mm in size are unlikely to cause renal colic symptoms. Similar results (graph not shown) were obtained for percent of stones that pass over the length of observation of each study.

Conclusion: Our findings suggest that the probability of stone passage and time to passage are similar among patients with stones who size is between 3 and 8 mm. Therefore, unless there are other contraindications to discharge, emergency physicians do not need to seek urgent urological consultation for such patients.



No, authors do not have interests to disclose

330 One-Year Outcomes in Operative Versus Non-Operative Management of Acute Appendicitis: Results of a Single State Multi-Year Study of Linked Statewide Databases

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Study Objectives: There are approximately 300,000 cases of acute appendicitis in the US annually. Both operative and non-operative management are considered reasonable options in uncomplicated acute appendicitis, but the relative costs, healthcare resource utilization, and long-term outcomes are unclear. This study aimed to compare one-year outcomes for emergency department (ED) patients with uncomplicated acute appendicitis who received same-visit appendectomy versus those who did not, including one-year ED revisits, repeat hospitalizations, eventual surgery, and cost.

Methods: Using three linked state-wide databases from the Maryland Healthcare Cost and Utilization Project (HCUP), we identified patients with a primary diagnosis of uncomplicated acute appendicitis treated in a Maryland ED between 2016 and 2021. We measured the healthcare utilization for each patient in the Ambulatory Surgery, Inpatient, and ED settings for one year following the initial ED visit. We used Medicare Relative Value Units (RVUs) and HCUP Cost-Charge Ratio files to estimate direct costs. Finally, we performed a multivariate logistic regression analysis comparing patients who obtained appendectomy vs non-surgical management on initial visit.

Results: In this study, 16,298 patients were identified as having acute appendicitis with 14,551 (89%) obtaining an appendectomy on the initial visit and 1,747 (11%) receiving non-surgical management. The rate of initial surgical vs non-surgical management changed minimally from 2019-21 compared to 2016-18 (90% vs 88%, $p<0.0001$). There was no association between appendicitis management type and patients' insurance status, race, ethnicity, or zip code stratified by income. Patients who obtained surgical management on their initial visit had a lower rate of ED revisits (8 vs 107 per 1,000 patients per year), lower rate of repeat hospitalizations (<1 vs 142 per 1,000 patients per year), shorter aggregate length of stay (1.9 vs 2.6 average hospital days per year), and lower direct costs ($4,183 vs $5,567) at one year ($p<0.0001$). Of those that received non-surgical management on their initial ED visit, 137 (8%) returned to the ED at a later date with an appendicitis complicated by perforation or abscess (compared with <1% in the surgical management group), and 304 (17%) obtained an appendectomy within one year.

Conclusions: In this retrospective multi-year study of linked statewide databases of a single state, ED patients with uncomplicated appendicitis who were treated initially with surgical management experienced fewer ED revisits, fewer repeat hospitalizations, lower one-year costs, and less risk of new perforation or abscess compared to patients receiving non-surgical management. Though this study is limited by its retrospective design, which may introduce selection bias when comparing the two groups, prior clinical trials have shown similar short-term outcomes. This study suggests that real-world outcomes still favor surgical management one year after the initial presentation of acute uncomplicated appendicitis.

No, authors do not have interests to disclose

331 Incidence and Predictors of Unplanned Return Emergency Department Visits: A Systematic Review

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Study Objectives: Unplanned return visits (URVs) to the emergency department (ED) are a common occurrence. At best, URVs represent failure of outpatient systems to address patient concerns and inefficient use of scarce ED resources; at worst, they reflect errors in ED diagnosis or management. Quantifying the incidence of URVs and understanding patient-level risk factors are crucial to ensuring high quality ED care as well as efficient resource use in the context of value-based healthcare reimbursement. This prognostic factors systematic review estimates the risk of URVs among adult patients discharged from the ED in the United States (US) and summarizes patient-level prognostic factors associated with their occurrence (PROSPERO: CRD42023483802)

Methods: A systematic search strategy was developed with a medical librarian to query Medline, EMBASE, Cochrane Library, and CINAHL for population-based studies of ED discharges that reported the rate of URVs within 30 days if the index ED visit. Randomized and nonrandomized studies (excluding case reports/series, narrative reviews, editorials, letters to the editor, and conference abstracts) were eligible for inclusion. Two independent reviewers screened abstracts and reviewed full-text manuscripts to determine compliance with *a priori* eligibility criteria, with conflicts resolved by consensus. Risk of bias assessment was performed using the Quality in Prognostic Studies (QUIPS) tool. Two independent reviewers independently abstracted study characteristics and data with a standardized instrument. Clinical heterogeneity precluded meta-analysis, thus included studies were qualitatively synthesized.

Results: Of 2,634 potentially relevant abstracts, 6 studies including over 19 million ED visits met inclusion criteria. QUIPS assessment revealed variable risk of bias due to nonrepresentative samples or failure to capture URVs at nonparticipating hospitals. Included studies used a variety of definitions for URVs by timing (3, 7, 14, and 30 days) and disposition (with or without hospital admission). Point estimates for the risk of URVs among discharged patients ranged from 1.6% to 4.7% at 3 days (4 studies) and 11.5% to 12.6% at 14 days (2 studies). The risk of URVs with hospital

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readmission ranged from 1.2 to 2.6% at 7 days (2 studies) and 1.7% to 2.0% at 14 days (2 studies). Male sex was most consistently associated with higher risk of URV (3 studies). Older age and white race were associated with higher 3-day URV risk in 1 study but were neutral in others. Patients with Medicaid and Medicare insurance (2 studies) and lower acuity measured by Emergency Severity Index (ESI) at triage (2 studies) were more likely to have an URV. Other reported prognostic factors included frequency of prior ED use, substance use and psychiatric disorders, and severe chronic medical illness.

Conclusion: This systematic review confirms that URVs are common in the US, with rates around 4% at 3 days and over 10% by 14 days, yet hospital admissions from URVs are uncommon. Predictors of URV include low triage acuity, behavioral factors, and chronic medical conditions, which suggests that non-clinical factors are important drivers of URVs.

No, authors do not have interests to disclose

332 An Emergency Department-Based Care-at-Home Program Increases Access to Post-Discharge Primary Care Appointments

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Study Objectives: An emergency department (ED) post-discharge care-at-home program can provide ED patients with follow-up care in the home after their ED visit. Such a program can also provide patients care navigation and facilitate transitions of care, especially to primary care. Access to primary care is important for improving patients' overall health and well-being. This study aims to evaluate if an ED's care-at-home program affects the rate of primary care follow-up visits for participating patients.

Methods: Our ED collaborates with our health system's Population Health Services Organization (PHSO) to provide ED discharged patients care-at-home. Care is overseen by emergency physicians via televideo visits and includes home health nurse visits, in-home diagnostics, parenteral medication administration, home physical therapy, wound care and robust care navigation within our health system. A discontinuity in time research design was applied to statistically estimate the effect of the ED care-at-home program on primary care follow-up visits. This retrospective quasi-experimental method capitalizes on the sharp increase in the proportion of discharged PHSO ED patients enrolled in the program following its launch on July 26, 2022. We examined data from PHSO patients who visited the ED between July 21, 2021 and December 31, 2023. We compared rates of subsequent primary care follow-up visits before and after the program's launch. To ensure the robustness of our findings, we restricted to a sample of encounters excluding patients deemed unsuitable for the program based on clinical criteria, including primary diagnosis and risk scores. The final analysis assessed average outcomes among all patients in this sample before and after the program launch, irrespective of individual program enrollment status, to mitigate omitted variable bias stemming from unobservable characteristics associated with patients' decisions to accept or reject enrollment. All regression analyses included controls for calendar month, patient gender, race, and primary diagnosis at the time of the ED encounter to account for seasonality and potential changes in patient composition over time.

Results: A total of 28,353 PHSO ED patient encounters were analyzed, comprising 14,356 encounters in the 12 months preceding program launch and 13,997 encounters in the 12 months following program launch. The average age of all the patients was 59.9 years (SD 19.7) and 16,847 (59.4%) patients were female. Patients' racial composition was: Non-Hispanic White =14,899 (52.5%), Hispanic = 5,708 (20.1%), Asian = 3,163 (11.2%), Black = 1,664 (5.9%), Other = 2,919 (10.3%). Patients were insured with traditional Medicare (10,645 or 37.5%), Medicare Advantage (4,189 or 14.8%), Commercial insurance (6,774 or 23.9%), Medi-Cal (6197or 21.9%), Other (548 or 1.9%). The LACE+ Index Score breakdown of the patients was as follows: 11,535 (40.7%) Medium Risk, 15,921 (56.2%) Medium High Risk, and 681 (2.4%) High Risk, and <1% with LACE+ score that could not be attributed. Following ED discharge, the 7-day primary care office visits rate increased by 1.7 percentage points (pre-mean = 8%, p<0.001), the 30-day primary care office visit rate increased by 3.6 percentage points (pre-mean = 20%, p<0.001), and the 60-day primary care office visit rate increased by 4.2 percentage points (pre-mean = 27%, p<0.001) in the 12 months after program launch.

Conclusion: This retrospective evaluation of an ED post-discharge care-at-home program showed evidence of improvements in engaging patients in primary care, a key component of transitions of care.

No, authors do not have interests to disclose

333 Effect of Contrast Dye on Renal Function of Those Who Presented With Acute Ischemic Stroke After Computed-Tomography Angiography Head and Neck

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Study Objectives: Contrast-induced nephropathy (CIN) is a feared aftereffect of intravascular (IV) contrast exposure in patients undergoing imaging studies. The primary objective of this study is to see if the use of IV contrast in patients undergoing computed tomography angiography (CTA) and/or computed tomography perfusion (CTP) increases the risk of acute kidney injury (AKI) in patients with symptoms of ischemic stroke. Patients exposed to nephrotoxic agents were excluded in this study.

Materials and Methods: This was a retrospective study of patients who presented to the emergency department with ischemic stroke over a 24-month period, from January 1, 2019, through December 31, 2021. Data from patients who underwent stroke protocol including non-contrast computed tomography of the brain (CTB), CTA, CTP, or a combination of the three were collected. Only patients without exposure to nephrotoxic agents (defined as vancomycin, Zosyn, or both) were included in the data set (study group; n=791). CIN was measured using initial baseline creatinine level (time 1) followed by levels after at approximately 48 (time 2) and 72 (time 3) hours after IV contrast was given. The primary outcome was presence of CIN defined as creatinine level of £1.1 (normal) versus >1.1 (abnormal) in patients who received IV contrast versus those who did not. Multivariable logistic regression models were performed to determine if change in creatinine was greater for those who received IV contrast while controlling for confounding variables such as age, BMI, baseline creatinine, and diabetes.

Results: Adjusting for variables, those receiving IV contrast compared to those who did not receive contrast were equally likely to have abnormal creatinine levels (>1.1) at time 2 (OR 0.824; P=0.4087) and time 3 (0.803; P=0.4447). Compared to those not receiving IV contrast, those who received contrast were just as likely to develop CIN from time 2 to 1 (1.961; P=0.3924) and from time 3 to 1 (0.800; P=0.7561). Conversely, those who received contrast were just as likely to have normal creatinine levels than those who did not receive IV contrast, both at times 2 (1.045; P=0.8412) and 3 (0.864; P=0.5930). Within each confounding variable, age was the single statistically significant variable associated with IV contrast exposure and development of CIN. Patients who received IV contrast at older ages were more likely to have an abnormal creatinine at time 3 compared to those not receiving contrast (1.031; P=0040). Interestingly, diabetics who received contrast were more likely to have a normal creatinine at time 2 compared to non-diabetics (1.705; P=0.0162). At time 3, both diabetic and non-diabetic patients were just as likely to have a normal creatinine after IV contrast exposure (1.105; P = 0.7197).

Conclusions: When controlling for confounding factors such as age, BMI, baseline creatinine, and diabetes, IV contrast exposure is not significantly associated with development of CIN in patients undergoing CTA with or without CTP of the brain for ischemic stroke. Additionally, the data showed significant increased risk of CIN in patients receiving IV contrast at older ages. Moreover, IV contrast seems to have a protective effect at 48 hours in diabetic patients who have received IV contrast. This closely mirrors findings in a previous study where diabetic patients taking Metformin may paradoxically afford protection from CIN after IV contrast exposure. Further research needs to be done to elucidate the mechanism of such protection. We hope that these findings offer an updated view on the effects of IV contrast on CIN in patients undergoing contrasted imaging.

No, authors do not have interests to disclose

334 Resuscitative Transesophageal Echo During CPR Identifies Targets to Improve CPR Quality

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Study Objective: Resuscitative Transesophageal Echo (rTEE) may enhance high quality CPR during emergency department cardiac arrest (EDCA) and impact survival but intervenable sonographic phenotypes remain underexplored and not defined. Our objective was to observe CPR under rTEE and identify phenotypic targets amenable to interventions that could improve CPR quality.

Methods: Retrospective study of EDCA subjects who underwent rTEE at a tertiary care center. Two trained reviewers extracted Utstein core and supplemental variables

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and corresponding rTEE clips representing 6 second CPR epochs. Trained rTEE reviewers examined rTEE clips of only mid esophageal long axis cardiac views and categorized each epoch for interpretability, number of aortic valve (AV) openings during CPR systole and CPR diastole, suggestion of AV outflow track obstruction, and fine ventricular fibrillation. Epochs were further categorized as congruent CPR (1 AV opening per CPR systole), or incongruent CPR (AV opening during CPR diastole). Descriptive statistics and 95% CI used to describe results.

Results: We observed 41 non traumatic OHCA of whom 75% were male with a median weight of 76 kg (IQR, 69-91). The median EMS response time was 10 minutes (IQR, 9-15) and bystanders began CPR in 12 cases (30%). First prehospital rhythm was PEA in 15 cases (38%), asystole in 13 (33%) followed by ventricular dysrhythmia in 4 (10%) and unknown rhythm in 7 (18%). Prehospital endotracheal intubation occurred in 17 (45%) subjects, supraglottic airway in 8 (21%) and no airway was placed in 10 (26%). Prehospital CPR occurred in 30 (75%) of arrests, defibrillation in 9 (23%), and 1 case was paced. A total of 16 (40%) achieved field ROSC at least once. At emergency department (ED) arrival 25 cases (65%) had ongoing CPR,14 with a mechanical CPR device in place (35%), and a CPR quality device in 1 case (3%). Median ED length of stay was 51 minutes (IQR, 23-304). The ED placed mechanical CPR devices in 5 (13%) cases. First ED rhythms were PEA in 19 subjects (48%), asystole in 7 (18%), and ventricular dysrhythmia in 4 (10%). Defibrillation never occurred in 19 subjects (61%). In the ED 26 subjects (65%) achieved 1 episode of ROSC. Survival to hospital admission occurred in 3 (8%) subjects and none survived to hospital discharge. rTEE findings included no pathology in 8 (20%) subjects, reduced systolic function in 9 (23%) subjects, left ventricular dilatation in 3 (7.5%), pericardial effusions without tamponade in 6 (15%), and no cases of pulmonary emboli, aortic dissection, or right heart strain. We captured 706 epochs of EDCA resuscitation with rTEE of which 167 (24%) were in the midesophageal long axis (MELA) view to assess CPR quality. A total of 90 (54%) MELA windows captured CPR epochs from 18 subjects (44%). Among CPR epochs, 62 (69%, 95% CI 59- 79) were of adequate quality to assess CPR quality. Aortic root compression was noted in 17 (19%, 95% CI 12-28) cases. CPR systole with congruent AV opening was noted in 28 (45%, 95%CI 33-57) and incongruent AV valve opening during diastole was noted in 17 (27%, 95% CI 18-40) . The mean frequency of AV opening during congruent CPR (ie, the proportion of AV openings per CPR thrust) was 88% (95%CI, 83-91) and incongruent CPR was 61% (95%CI, 53-68). Ventricular fibrillation was identified in 2 cases (3%, 95% CI, 1-11). Kappa on a small (5) random sample for adequacy and congruency between two reviewers was perfect (1.00).

Conclusion: We identified 3 phenotypic CPR variants (aortic root compression, congruent and incongruent CPR) representing potential targets for improving CPR quality under rTEE though the proportion of indeterminate or inadequate views during CPR is high.

No, authors do not have interests to disclose

335 Assessment of Transesophageal Echocardiography on Chest Compression Fraction and Clinical Outcome in Patients With Non-Traumatic Out-of-Hospital Cardiac Arrest

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Study Objectives: Transesophageal echocardiography (TEE) has become increasingly integrated into the resuscitation protocols for cardiac arrest patients; however, the benefit of TEE in cardio-pulmonary-cerebral resuscitation (CPCR) is uncertain. In this study, we aimed to explore the impact of TEE on chest compression fraction (CCF) and patient survival throughout the resuscitation process.

Methods: We conducted a retrospective cohort of video recordings of the resuscitation process in adult patients presented to emergency department of Dalin Tzu Chi Hospital with non-traumatic, out-of-hospital cardiac arrest between December 15, 2023 to March 15, 2024. Patients with cardiac arrest who underwent TEE were categorized as the TEE group, while those who did not were categorized as the non-TEE group. The primary outcome was CCF, and the secondary outcomes were pause during CPCR, rate of return of spontaneous circulation (ROSC), and survival to discharge between these 2 groups.

Results: During the study period, 27 patients with non-traumatic cardiac arrest were enrolled (mean age 70.3 [SD 15.9] years; 41% female). There were 11 patients in the TEE group and 16 patients in the non-TEE group. In the primary outcome, a better CCF performance was observed in the TEE group compared to the non-TEE group (90.4% vs 80.3%, p=0.005). In secondary outcomes, the TEE group tended to have fewer pause numbers in every CPCR cycle (median, 1.2 vs 1.4 pause per 2 minutes, p=0.1) compared to non-TEE group, but there was no statistically significance. There was no significant difference of length of resuscitation, rate of ROSC lasting > 1 minute, rate of ROSC lasting > 20 minutes, and rate of survival to discharge between both groups.

Conclusions: In the observational study, the implementation of TEE in patients with out-of-hospital cardiac arrest did not impede the resuscitation process and was associated with an improvement in CCF. A possible reason for this finding is that utilizing TEE during CPCR may reduce the time required to check for a pulse compared to transthoracic echocardiography and traditional methods. However, due to the small sample size in this study, further investigation is warranted to elucidate its potential benefits.

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336 $ETCO_2$ as a Prognostic Marker in Cardiac Arrest Patients: A Systematic Review and Meta-Analysis

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Background: End-tidal carbon dioxide ($ETCO_2$) measurement has emerged as a valuable tool in the field of resuscitation medicine, offering insights into both physiological processes and potential prognostic indicators during critical care scenarios. $ETCO_2$ refers to the partial pressure of carbon dioxide (CO_2) in respiratory gases at the conclusion of exhalation. In the context of cardiac arrest, $ETCO_2$ levels play a pivotal role in assessing the effectiveness of resuscitative efforts and predicting patient outcomes. Although leading resuscitation organizations endorse the use of capnography to assess CPR quality and confirm endotracheal tube placement, there is a lack of consensus on the utility of $ETCO_2$ as a predictive tool for resuscitation outcomes.

Methods: A systematic literature search was performed in PubMed, EMBASE, and the Cochrane Library to identify all relevant prognostic accuracy studies published before December 31, 2023. Original articles reporting the prognostic accuracy of $ETCO_2$ for ROSC prediction in adult patients with cardiac arrest were included. Study data were abstracted by two independent reviewers using a standardized data extraction form. We calculated sensitivity, specificity, and corresponding 95% confidence intervals using 2x2 contingency tables at 0, 10, and 20 minutes post-$ETCO_2$ measurement. Results were graphically presented via forest plots and ROC space. Given varied $ETCO_2$ cutoffs, we employed a multiple thresholds model for meta-analysis. Test distribution parameters were estimated using linear mixed-effects modeling for positive and negative outcomes, generating summary ROC curves. Heterogeneity was assessed clinically and visually. Additionally, we conducted a meta-analysis of median $ETCO_2$ values at each time point using the Median of Medians method, extracting concentration and spread data from studies.

Results: Fourteen studies were included in the meta-analysis. The optimal $ETCO_2$ cutoff at 0 minute were 19.8 mmHg with pooled sensitivity of 0.75 (95% CI, 0.60-0.85), pooled specificity of 0.53 (95% CI, 0.40-0.65), and diagnostic odds ratio (DOR) of 3.38 (95% CI, 1.00-10.52); the optimal $ETCO_2$ cutoff at 10 minute were 15.7 mmHg with pooled sensitivity of 0.91 (95% CI, 0.72-0.97), pooled specificity of 0.68 (95% CI, 0.56-0.78), and DOR of 21.49 (95% CI, 3.27-114.64); the optimal $ETCO_2$ cutoff at 20 minute were 8.5 mmHg with pooled sensitivity of 0.95 (95% CI, 0.53-0.99), pooled specificity of 0.78 (95% CI, 0.39-0.95), and DOR of 63.61 (95% CI, 0.72-1881). $ETCO_2$ measured at 20 minutes exhibited highest AUC of 0.88 (95% CI, 0.31-0.98), followed by AUC of 0.82 (95% CI, 0.61-0.91) at 10 minute and AUC of 0.67 (95% CI, 0.57-0.75) at 0 minute.

Conclusions: This systematic review and meta-analysis indicate that $ETCO_2$ measured at 0 minutes demonstrates poor prognostic accuracy for detecting ROSC in adult cardiac arrest patients. Conversely, $ETCO_2$ measured at 10 minutes and 20 minutes exhibits fair prognostic accuracy. With its high sensitivity, $ETCO_2$ measurements could inform clinical decisions regarding the termination of CPR and predict poor outcomes. Furthermore, our study highlights that the disparity in $ETCO_2$ levels between ROSC and non-ROSC groups widens as time progresses.

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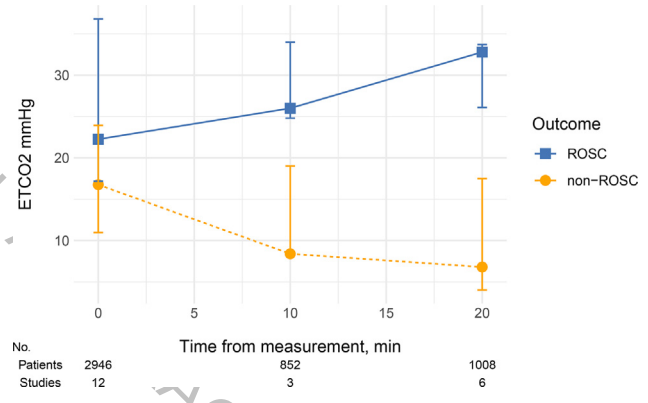

No, authors do not have interests to disclose

337 Operational Effects of the Organic Implementation of an Emergency Department-Based Resuscitative Care Unit Model

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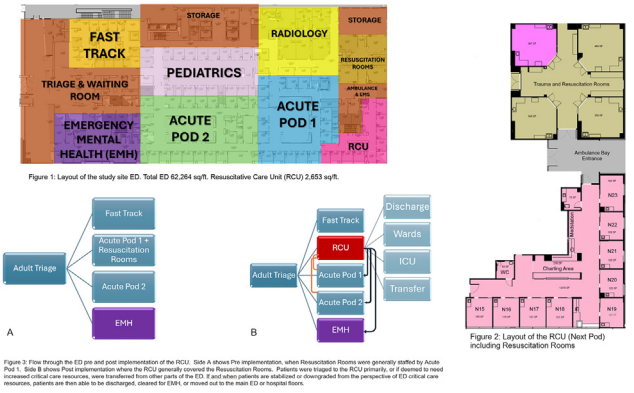
Study Objectives: Emergency department (ED)-based Resuscitative Care Unit (RCU) models are being implemented to address increasing patient acuity and boarding. We have previously evaluated the improved fiscal impact of these units. The operational ramifications of the RCU as a split-flow critical care zone remain to be evaluated. Our study aims to assess the operational ramifications of integrating a small-scale RCU within the existing infrastructure of an ED using current procedural terminology (CPT) coding as a indicator of Resource Value Units per hour, a known marker of ED efficiency. To date, the operational effects of an RCU on the operations of the entire ED are poorly understood.

Methods: We conducted a retrospective quasi-experimental study at an academic hospital as a Plan-Do-Study-Act (PDSA) cycle of quality improvement initiatives while eliciting staff feedback. Study period was 35 weeks pre/post from 11/2018 - 3/2020. Staffing consisted of 3 nurses and an increased patient-to-nurse ratio of 3:1 (from 5:1). Physician coverage included 1 attending emergency physician & 1 emergency medicine resident. The RCU was created by repurposing a 9-bed unit of the ED (~2,653 sq ft) with no physical space or floorplan change to ED layout (62,264 sq/ft). This area had previously functioned as a boarding area of the ED. Capital improvements were limited, mainly the addition of a Pyxis™ MedStation™. Patients were triaged to the RCU primarily or were moved from other parts of the ED if deemed to need increased critical care resources. Patients followed normal ED flow if stabilized or downgraded from the perspective of ED critical care resources. We compared non-critical care CPT codes (99281, 99282, 99283, 99284, 99285) and critical care CPT codes (99291, 99292) pre/post RCU implementation. We used these codes as a marker for overall ED efficiency via changes in documentation practices. Statistical analysis was performed using Student's t-test.

Results: The RCU occupied 4.26% of total ED square footage. During the post period, 5,159 patients were triaged initially to the RCU, a mean of 19.8 patients per day. This did not account for patients transferred to the RCU later in their ED course, so it underestimates the total number of patients cared for in the unit. Pre/Post Total ED visits: 38,283/36,424. As part of the process improvement PDSA cycle work, staff reported that in the lower acuity areas of the ED they perceived that they could dedicate more attention to all of their patients when not burdened with a critically ill patient requiring prioritization of their attention. In the pre-period, 6.2% and 0.5% of all CPT codes billed were 99291 and 99292, respectively. In the post-period, 8.8% and 1.0% of all CPT codes billed were 99291 and 99292, respectively. Post resulted in a 2.6% (95% CI: 2.2-2.9) net increase of 99291 billed (increase of 41.94%) and a net increase of 0.5% (95% CI: 0.4-0.6) of 99292 billed (increase of 100%). Encounters where 99292 was billed multiple times increased by 128.13%. Post the total percentage of 99282 decreased by 23% (9.1% vs 7.0%, $p<0.001$) and 99283 decreased by 29.63% (16.2 vs 11.4, $p<0.001$). The percentage of 99285 increased by 10% (31.7% vs 34.9%, $p<0.001$) in the post-period. There was a non-statistically significant increase in 99284. No changes were seen in 99281 billed.

Conclusion: The RCU, which utilized only a small portion of the overall ED area, served a small number of total ED encounters and was integrated with minimal structural changes. Despite this, it had a notable effect on ED efficiency using CPT codes as a surrogate marker, suggesting improvements in overall operational effectiveness. In evaluating CPT billing codes, we noted a decline in lower complexity codes and an increase in higher complexity and critical care codes throughout the entire ED. This was reflected in the PDSA feedback, and likely manifested in improved documentation efficiency. This study represents a novel analysis of an RCU as a split-flow critical care zone to improve ED operations.



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338 Inter-Rater Reliability and Acceptability of a Clinical Prediction Rule for Opioid-Associated Out-of-Hospital Cardiac Arrest

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Study Objectives: Although 7-14% of out-of-hospital cardiac arrests (OHCAs) are precipitated by opioid overdose, the fact that there are no emergency medical services (EMS) validated tools to identify opioid-associated OHCA (OA-OHCA) during acute resuscitation efforts limits the ability to provide targeted treatments for these patients. The recently derived NAloxone Cardiac ARrest Decision Instruments (NACARDI) clinical prediction rule represents a potential mechanism for EMS providers to rapidly identify OA-OHCA while in the field. In this study we sought to assess the inter-rater reliability and acceptability by EMS providers with the application of the NACARDI rule for the prediction of OA-OHCA.

Methods: The NACARDI rule in this study consisted of two criteria: patient age <60 years and unwitnessed cardiac arrest. EMS providers hypothetically applied the NACARDI criteria during acute resuscitations of patients with OHCA in San Francisco between September 2022 – February 2024 and rated its ease of use on a five-point Likert-type scale. They also answered a short series of questions assessing the timing during the resuscitation when they were able to apply the NACARDI criteria and potential barriers to its use. In cases where two providers completed NARCARDI assessments, we calculated a kappa coefficient of agreement between these pairs.

Results: We evaluated 149 cases of OHCA, with 100 (67.1%) cases having survey responses from one treating EMS provider and 49 (32.9%) having survey responses from two treating EMS providers. EMS providers were able to ascertain the NACARDI criteria prior to or during the first cardiac rhythm check in 80.0% of cases. The NACARDI criteria were reported as easy to use (Agree or Strongly Agree) by 83.4% of EMS respondents. The three most common reasons why NACARDI criteria were deemed difficult to ascertain were chaotic scene, language barrier, and unreliable bystander accounts. The Kappa coefficient for applying the NACARDI criteria was 0.73 (95% CI 0.51-0.95), representing substantial agreement.

Conclusion: The majority of surveyed EMS providers found the NACARDI criteria easy to use and they were able to be ascertain the criteria early enough in a resuscitation to allow for the provision of targeted therapies for OA-OHCA. There was substantial agreement in how the NACARDI criteria were interpreted for each case. These findings suggests that the NACARDI criteria can be reliably and easily used by EMS providers during acute OHCA resuscitations to identify OA-OHCA patients who may be amenable to targeted interventions.

No, authors do not have interests to disclose

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339 Development of an Ultrasound Computer Algorithm Enabled Handheld Device to Detect Pneumothorax Real Time in a Live Swine Model

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Study Objectives: Pneumothorax (PTX) remains among the most common injuries servicemembers face during military conflicts. Decompression is the standard treatment but diagnostic ambiguity related to physical exam limitations make assessment difficult. In one study, only 61% of pre-hospital thoracostomies were performed with appropriate indication for PTX. Fast and effective identification of PTX has been identified by the Defense Health Agency as a priority. Development of a simple to use handheld ultrasound-enabled device could improve identification of PTX and appropriate needle decompression (ND).

Methods: The novel Automated Needle Decompression (ANeeD) device combines an electromechanical device capable of automating needle decompression with in- house ultrasound software algorithms to detect PTX. Retrospectively 80 months of emergency department visits with diagnosis of PTX were identified. Of the 896 visits 164 DICOM B-mode ultrasound studies were randomly chosen, videos extracted, de-identified for labeling and duplicately review by 2 ultrasound fellowship trained emergency physicians. Adequate quality PTX+/- videos with 2 reviewer agreement were selected to test initial algorithms. Classical computer vision techniques were used to develop the algorithm which uses B-mode ultrasound video to identify anatomic landmarks (ribs, pleural line), define a region of interest (ROI), and analyze for lung sliding via multiple M-mode readings. Five ~45 kg Yucatan Minipigs were anesthetized, each undergoing two sessions of resting after pigtail chest tube placement. For the first 3 sessions B-mode video was captured at each intercostal space in the mid and anterior axillary line on the swine while PTX was not present. Approximately 1,000 cc of air was instilled into the pleural space, creating a PTX confirmed on x-ray, pleural manometry, and ultrasound. The recording process was repeated. Video data was used to aid the integration of the algorithms into the device graphical user interface (GUI), refine parameters, and ensure computational hardware would run in real time. For the final three swine sessions, algorithms were integrated into the GUI and same scanning protocol was applied. The device recorded B-mode video during these sessions and was activated to assess the intercostal space for pleural depth, rib edge, and PTX over approximately 7-10 seconds. PTX+/-, rib and pleural detection, and other anatomic features (gut, heart, apex) were recorded real time at each interspace. Sensitivity and specificity for PTX for lung body and apex and accuracy for pleural line and rib detection were calculated for each session and retrospectively using full dataset for recomputed final algorithm performance.

Results: For sessions 4-6 there were 41, 24, and 24 successive assessments taken at the lung body and 14, 10, 9 assessments at lung apex. Variable number of assessments was due to only performing analysis in device "large" mode on the final swine due to thicker chest wall. Lung body real-time sensitivity and specificity for pneumothorax for each session were 88%/81%, 100%/42%, 93%/.78% and recomputation 94%/ 86% (95% CI: 84%-98% and 71%-95%) respectively. At lung apex real-time sensitivity and specificity for each session was 88%/67%, 100%/100%, 83%/67% and recomputation 89%/71% (95% CI: 67%-99% and 49%-95%) respectively. For session 4-6 real-time lung body overall accuracy to detect rib margins within 1mm was 83% and 96% at 5mm. Overall accuracy for pleural line detection within 1mm was 82% and 91% below 5 mm above pleural line.

Conclusion: In a limited dataset ANeeD algorithms are highly sensitive and moderately specific for PTX detection on a live swine model with better performance on lung body than at the apex. Pleural and rib margin detection is moderately accurate to within 1 mm and highly accurate within 5 mm. In the future algorithm based hand-held ultrasound devices may have potential to assist with diagnosis and treatment of pneumothorax in resource limited environments. Larger video sample size testing and human studies are needed to validate ANeeD findings.

Yes, authors have interests to disclose
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Consultant/Advisor Fujifilm/Sonosite and Creare LLC
Disclosure: Creare LLC
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340 Does BMI Play a Role in Diagnosing Tubo-Ovarian Abscess?

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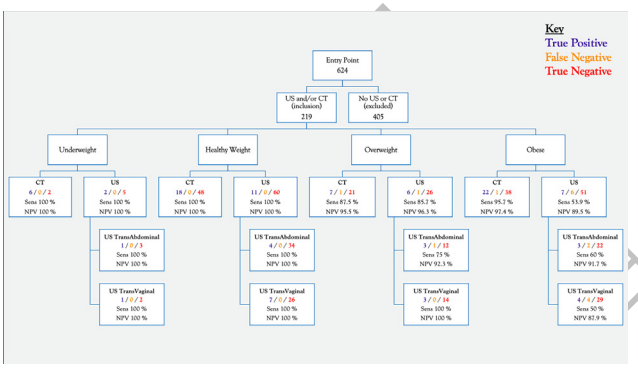
Background: Tubo-ovarian abscess (TOA) is a known complication of pelvic inflammatory disease characterized by an inflammatory mass of the fallopian tube, ovary, and/or other adjacent pelvic organs, and early diagnosis prevents complications. Although laparoscopy is the gold standard to diagnose TOA, ultrasound is the diagnostic imaging modality preferred as it lacks ionizing radiation, is non-invasive, and has an accuracy of diagnosis with reported sensitivity 56-93% and specificity 86-98%. While ultrasound evaluation of appendicitis in children with obesity has shown decreased sensitivity compared to age matched peers; to our knowledge, no studies exist at examining the relationship between obesity and US sensitivity in diagnosing TOA.

Study Objectives: The study aimed to investigate if higher BMI patients diagnosed with TOA had a significant rate of false-negative ultrasound. We secondarily evaluated if the false-negative study was a transabdominal or transvaginal ultrasound.

Methods: This retrospective chart review study analyzed patients' charts from 1/1/2018 to 12/31/2022 with the diagnosis of TOA in the Pediatric and Adult emergency department. Inclusion criteria included patients with at least one of the following imaging modalities: abdominal ultrasound, transvaginal ultrasound, or CT abdomen and pelvis. Patients without imaging were excluded. A patient was classified as positive for TOA if they had one positive imaging modality and received TOA treatment. A false-negative study was identified when one imaging modality was negative while another was positive for TOA, and the patient was treated for TOA. There were no false-positive studies as all patients received treatment for TOA. Patients were classified by their BMI as underweight, healthy, overweight, or obese. IRB 2036484-2.

Results: Of the 560 charts reviewed, 219 met inclusion criteria and of those, 54 were TOA positive patients. In the underweight and healthy groups, the sensitivity and negative predictive value of US diagnosing TOA were 100%. In the overweight group the sensitivity and negative predictive value of ultrasound was 85.7% and 96.3% respectively. The overweight group had one false-negative transabdominal ultrasound. In the obese group the sensitivity and negative predictive value of ultrasound decreased to 53.9% and 89.5% respectively. The obese group had four patients with false-negative ultrasound, two transvaginal ultrasound and two both ultrasound. Additionally, each overweight and obese group had one false-negative CT. In total, there were seven false-negative patients in the overweight and obese groups combined, and none in the normal or underweight group, with a statistical difference of p-value 0.0162.

Conclusion: This study highlights a statistically significant number of false-negative imaging studies in patients classified as overweight and obese with TOA diagnosis, the majority of which were ultrasound studies. Although further studies are needed to delineate optimal imaging, vigilance is needed in patients with high BMI, as imaging modalities may be inaccurate.



No, authors do not have interests to disclose

341 Ultrasound-Guided Vascular Access Training: The Need for Novel Training Phantoms With Realistic Vascular Anatomy and Patient Positioning

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Study Objectives: Ultrasound guided catheter placement and ultrasound guided procedures are commonly taught in resident and medical education programs by use of gel phantom models in a simulation setting. Traditional models for catheter placement involve straight tube encased in a gel medium in a rectangular mold. This model fails to replicate challenges of patient positioning, vein anatomy, and need for hand eye coordination encountered in the real-world clinical setting. This project aims to evaluate a novel, easily replicated realistic vascular access model for use in simulation training.

Methods: Cross-sectional study at an academic medical center. Novel peripheral IV phantom models were constructed using silicone tubing to simulate veins, with the tubing removed to create a space filled with tap water, representing the venous lumen. These vessels were embedded in ballistics gel, mimicking the anatomical positioning and tortuosity of arteries and veins using 8Fr flexible stylets. To facilitate imaging, the gel phantoms were secured to a Z-tilt camera stand using 3D printed plastic molds (Z Flex Tilt Tripod Head, Move Shoot Move). The camera stand was held in place on classroom tables by a simple clamp, with the goal of recreating the positioning of a patient's arm while laying in a semi recumbent position on an ED gurney (Figure 1) Emergency medicine residents and attendings who were trained in ultrasound-guided peripheral IV access with traditional phantoms attempted IV access on our new IV simulation models. All participants completed a pre- and post-procedure questionnaire. Participants were subjectively evaluated during the activity for their ability and skill with ultrasound guided IV placement.

Results: A total of forty-one subjects participated in this study (5 attendings (12.2%), 9 PGY-1 (22.0%), 13 PGY-2 (31.7%), and 14 PGY-3 (34.1%) residents. Three PGY-3 residents had not undergone prior phantom training. Observer evaluation of participants found that participants were confident appearing and competent with technical skills, with increasing levels of competence following increased training by year. The majority (65%) of participants found the novel training phantom to be more challenging than traditional training models. The novel phantom was reported to be more realistic than traditional phantom models ($p<0.01$). The majority of participants (65%) found this novel phantom superior to traditional training phantoms utilized and would recommend our phantom for future training sessions.

Conclusions: The novel phantom created was a helpful training tool for simulation practice with realistic positioning and anatomy challenges associated with ultrasound guided IV placement. Further improvements to replicate positional difficulties while cannulation should be considered for future work.

No, authors do not have interests to disclose

342 What's a FAST Tip? A Systematic Stepwise Approach Utilizing Multireader Consensus to Define the Caudal Tip of the Liver and Spleen With Implications for Artificial Intelligence Development

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Study Objectives: In order to identify hemoperitoneum during the FAST exam clinicians must interrogate critical dependent anatomic spaces known to accumulate free fluid. One such anatomic space is the caudal tip of the liver and spleen, which has been found to be one of the more sensitive locations for fluid detection. However, the sonographic features of this anatomic landmark are not well described. The goal of this study is to utilize multi-reader expert consensus to define satisfactory visualization of the caudal tip of the liver and spleen in order to develop an artificial intelligence (AI) algorithm capable of reliably identifying this feature.

Methods: We performed a stepwise prospective study to define the caudal tip. First, two ultrasound trained physicians defined caudal tip as a "clearly outlined, rounded edge of the caudal portion of the liver or spleen, with visualization of surrounding tissue". FAST exam images were frame annotated to train an algorithm to identify the caudal tip using this definition. Next, 11 emergency physicians (EPs) utilized their clinical gestalt to evaluate 52 videos of right and left upper quadrant for the presence of the caudal tip. We compared the majority consensus EP evaluation to the original frame annotation by calculating a Cohen's Kappa coefficient. The study team then met to evaluate representative disagreements and revised the original definition to remove the need for the caudal tip to be "clearly outlined". Frame annotations were then revised and a new algorithm was trained.

Results: Using the original definition, the algorithm had sensitivity, specificity and F1 scores of 0.52, 0.98, and 0.48 respectively. The interrater reliability of the majority EP read compared to the original frame annotation demonstrated a kappa of 0.68 for liver tip and 0.4 for spleen tip. The study team reviewed videos for which the majority of readers identified a caudal tip that was not identified by the original annotation. These videos were found to contain bowel gas obscuring the caudal edge, making the exact boundary between liver and spleen poorly demarcated sonographically. The raters felt that the presence of bowel gas ruled out the presence of free fluid, and therefore exams demonstrating this feature could be considered satisfactory for the evaluation of the caudal tip. After incorporating the revised definition of the caudal tip, the algorithm was retrained using the new definition and showed a sensitivity, specificity and F1 of 0.72, 0.81, and 0.65 respectively.

Conclusions: In order to acquire a complete FAST exam, the user must evaluate the caudal tip of the liver and spleen defined as "a rounded edge of the caudal portion of the liver/spleen with visualization of surrounding tissue". However, the boundary of this feature need not be clearly outlined. This definition can be used for training and continuing quality review of FAST exam learners. The work also underscores the importance of validating annotation definitions in algorithm development for point-of-care ultrasound applications.

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343 Beyond the Focused Assessment With Sonography in Trauma Exam: Design and Utilization of a Trauma-Focused Rapid Education Event for Emergency Medicine Attending Physicians

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Study Objectives: Using comparison of pre- and post-test scores and direct observation of learners, this study sought to determine the efficacy of one Rapid Education Event in teaching attending physicians to: 1) Obtain adequate ultrasound images and identify relevant anatomy to perform the fascia iliaca block on standardized patients. 2) Demonstrate the correct steps to perform a fascia iliaca block on gel phantoms. 3) Perform the necessary steps to obtain the images required for an ocular POCUS procedure and identify common pathology. 4) Perform the necessary steps to obtain views of the heart in the parasternal long, parasternal short, apical four chamber and subxiphoid axis. 5) Identify advanced cardiac pathology and understand it's physiologic relevance including wall motion abnormalities, right ventricular strain, and pericardial effusion/ tamponade. 6) Perform the necessary steps to acquire the required lung ultrasound images. 7) Interpret images to assess for pleural disease/ pathology including pneumothorax and interstitial syndromes.

Methods: Attending physicians were invited to participate in a "Rapid Educational Event" accepted for Continuing Medical Education credits through our hospital system. The topics to be covered were advertised in advance and were relevant to patients who have experienced traumatic injuries. The educational event was designed to have lecture-based education first followed by hands-on practice with standardized patients and gel phantoms. Participants took part in a pre- and post-test to assess for knowledge base and improvement after the educational session. The educational event took place in a standard lecture hall and simulation center featuring standardized patients.

Results: Out of the ten total attending physicians who participated in the rapid educational event, seven demonstrated improvement in their knowledge of point-of-care ultrasound procedures covered in the course as evidenced by comparing their pre- and post- test scores. Three participants had the same score in their pre- and post- tests. Mean pre-test score was 12.2 [1.89] and post-test mean score was 13.6 [1.02], with a maximum score of 15 points. A one-tailed Welch's t-test found significant improvement in learners' scores following the education session ($P = 0.04$). All learners demonstrated improvement in both image interpretation and motor skills throughout the hands-on portion.

Conclusion: The attendings who participated in our Trauma Rapid Education Event demonstrated a good baseline understanding of the principles of POCUS when applied to the trauma patient, though scores did improve following the event indicating that the event was successful in educating attending level physicians. Learners also demonstrated improved motor skills and image interpretation throughout the hands-on portion of the event. This model appears to be effective in expanding trauma POCUS procedural skills for attending level physicians.

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344 Use of a Nerve Block Supply Cart in Promoting Ultrasound-Guided Nerve Blocks Done in the Emergency Department

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Background: Ultrasound-guided nerve blocks are an effective and safe method of pain control that are being increasingly used as part of a multimodal approach to pain management in the emergency department (ED). Setup for and execution of these procedures is often time-intensive due to the supplies needed. Our ED recently implemented use of a nerve block cart, which has readily available supplies for these procedures. These include various short- and long-acting local anesthetics, nerve block needles, intralipid, syringes, needles, sterile drapes, and cleaning supplies. Nerve block supply carts may be an effective way to encourage more providers to perform these procedures.

Study Objective: To investigate if the number of ultrasound-guided nerve blocks performed in an ED significantly increased after implementation of a nerve block supply cart.

Methods: We reviewed point-of-care ultrasound scans performed in a single academic quaternary care community emergency department over 12 months, looking at 6-month time periods before and after implementation of an ED nerve block supply cart in March 2023. Ultrasound scans were reviewed over the QPATH database by emergency medicine residents, ultrasound fellows, and ultrasound attendings.

Results: After review of 12 months of data, comprising 6 months each pre- and post-cart implementation. 3,698 ultrasound studies over 184 days were reviewed in the pre-cart period, and 3,929 ultrasound studies over 184 days were reviewed in the post-cart period. A total of 4 nerve blocks (0.11%) were performed in the pre-cart period compared to 34 (0.87%) in the post-cart period, representing an 8-fold increase that was statistically significant($p<0.0001$).

Conclusion: Nerve block supply carts may be an effective way to increase the number of ultrasound-guided nerve blocks performed in the ED.

No, authors do not have interests to disclose

345 Quality vs Speed: Can a Nebulizer Get Asthma Patients Home Faster

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Study Objectives/Background: Traditional asthma treatments include steroids and hour-long nebulizer treatments of albuterol. However, there are many nebulizer devices now on the market that deliver albuterol in minutes. We currently use four different nebulizer models at Community Regional Medical Center which include Westmed Inc mini-HEART Hi-Flo Jet Nebulizer, Monaghan AeroEclipse II Breath Actuated Nebulizer, Salter Labs NebuTech High-Density Nebulizer, and Aerogen Vibrating Mesh Nebulizer. There are no published head-to-head comparisons in the literature showing which nebulizer is best for helping administer the medication the quickest and in turn, improve throughput time in a busy emergency department (ED).

Methods: This was a prospective, observational study of ED patients with asthma exacerbations needing nebulizer treatments. We looked at the efficiency and efficacy of four nebulizer devices in asthma patients ages 3 and up. The study spanned 2018 to 2023 (enrollment paused 2019-2021 secondary to COVID). Patients were randomized to 4 nebulizer treatment arms. Asthma severity scores and peak flows were calculated pre and post-treatment. Statistics were calculated using ANOVA.

Results: The control group (mini-HEART Hi-Flo Jet Nebulizer) had a mean post-treatment asthma severity score of 5.53 with mean peak flow values of 301.13. The mean values for the Aerogen, Aeroeclipse and Nebutec were 5.73 and 292.73, 5.92 and 248.53, and 5.72 and 301.13 respectively with p-values >0.05 for all three nebulizers. The mean administration time for the control group was 73.89 minutes when compared to the Aerogen (16.89), Aeroeclipse (17.92) and Nebutech (15.44), with all having p-values <0.05. The control group did have a statistically significant improvement in peak flow, 103.32 [88.02, 118.63], when compared to the other three nebulizers. The control group also had a statistically significant improvement in asthma severity score, -1.59 [-1.82, -1.37].

Conclusion: All four nebulizers are effective in improving peak flows and asthma severity scores. However, the administration time of the medication is significantly faster using one of the non-control devices and is beneficial in improving ED length of stay in asthma patients.

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346 A Comparative Analysis of Machine Learning Models in Predicting Emergency Department Patient Volumes in a University Hospital

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Background: Matching adequate resources to meet patient needs is crucial to providing effective and efficient emergency department (ED) care. Stochastic variation in patient arrivals, severity of illness, and admissions boarding in the ED, can create a resource to patient need mismatch. Predictive modeling presents a promising approach to anticipate and mitigate these challenges, enhancing operational decisions and patient care.

Study Objective: The objective of this study was to test if machine learning models could accurately predict waiting room volumes in EDs, aiming to facilitate better resource management and improve patient throughput.

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Methods: We developed and evaluated three machine learning models—Random Forest (RF), Support Vector Machine (SVM), and Linear Regression (LR)—to forecast patient volumes in the ED waiting room. The data for training these models was collected over a one-year period, from February 2023 to February 2024, at an urban, academic emergency department. The variables used represented daily means, averages or counts. Our models' features included: median turnaround times (laboratory and radiology), number of tests ordered (laboratory and radiology), time from arrival to seeing a doctor, time from arrival to bed assignment, time from bed assignment to disposition, time from disposition to departure, time for consultation to admission, average number of boarders, functional capacity, number of all patient arrivals, total hours blocked, average number of observation patients, and length of stay for all ages across all dispositions. The outcome variable we aimed to predict was the daily average waiting room volume, a continuous value. We split the dataset into 80% for training and 20% for testing purposes. Model performance was assessed using metrics such as the R2 and root mean squared error (RMSE). To determine the most effective timeframe for predictions, we experimented with varying the lag in our data from 1 to 7 days, assessing which lag period provided the best predictive accuracy.

Results: Over the course of one year, there were 78,790 ED patient visits, with a median daily visit count of 216 (interquartile range, [IQR] 203-230). The median volume in the waiting room was 32, with an IQR of 23 to 41. To test the accuracy of forecasting future ED waiting room volumes, we evaluated the effectiveness of using data from previous days, examining lags ranging from 1 to 7 days. Our analysis showed that lagging predictors by one day was the most effective in forecasting ED waiting room volumes for the following day. Among the tested models, the LR model demonstrated the best performance, achieving the lowest RMSE of 9.48, which was superior to the RF at 10.08 and the SVM at 11.66. Similarly, LR showed the best overall R2, at 0.56.

Conclusion: This pilot study demonstrates the performance of ML models in predicting daily ED waiting room volumes at a University ED. The ability to forecast ED waiting room volumes one day in advance using retrospective data facilitates resource allocation, staffing, and patient flow management, which are crucial for enhancing patient care and operational efficiency. Our best-performing model, on average, deviates by approximately 10 patients from the observed mean waiting room volumes. We believe that this level of error is considered manageable for operational purposes, including staffing and resource allocation in the emergency department. Given the preliminary nature of our findings, future research should consider several improvements. Integrating real-time data could provide more dynamic inputs, thereby increasing the model's responsiveness to fluctuations in emergency department demands. Additionally, employing more complex modeling techniques may refine the predictive accuracy of our outputs.

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347 Efficacy of the Weapon Screening Protocol in Mitigating Workplace Violence at Duke Emergency Department

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Background: Recent data shows a rising trend of workplace violence against healthcare workers, who face nearly five times the risk of assault compared to other professions. Despite this, only one-third of U.S. hospitals have implemented metal detectors at the entrance of emergency departments (EDs), crucial tools for preventing weapon-related incidents and potentially life-threatening injuries. Moreover, many hospitals neglect weapon screening in critical care areas like ambulance bays, where the absence of detectors creates a substantial security gap. To address this issue, we evaluated a new measure, the Weapon Screening Protocol (WSP), at an urban, academic, level one trauma center ED.

Methods: The WSP intervention involves a collaboration between security officers and the clinical staff at the ambulance bay entrance to the Duke University Hospital ED. Upon arrival, stable patients undergo screening with a Portable Metal Detector (PMD) conducted by security personnel. If the screening indicates the presence of metal, the patient's belongings are further examined with a weapon surveillance detection machine. For patients in acute distress, immediate medical care takes precedence; however, protocol dictates the security team promptly notifies the clinical team about the potential risk of weapons. Additionally, as part of a comprehensive assessment, nursing staff administer a questionnaire to all responsive patients regarding weapon possession. Data collection comprised the period from January 2023 through January 2024, with the WSP intervention implemented in October 2023. Data were recorded in a log maintained by security personnel responsible for performing the WSP.

Results: During the twelve-month study period, there were 16 recorded instances of weapons brought into the hospital, averaging 1.33 incidents per month. The majority of these cases involved bladed weapons (10 instances, 63%), followed by firearms (5 instances, 31%). One incident included both a firearm and a blade. There was also one instance (6%) involving a loaded magazine without an accompanying firearm. Following the implementation of the WSP, a total of 10,579 Emergency Medical Services vehicles were screened, with a monthly average of 2,645 screenings (standard deviation, SD $\pm$ 222). This led to the confiscation of 222 weapons, averaging 55.5 per month (SD $\pm$ 4.43) preventing their entry into the building. In the four months post-intervention, only four weapons were discovered within the hospital by the medical team—three knives and one firearm.

Conclusion: The initial outcomes following the implementation of the WSP demonstrate its effectiveness and precision in intercepting weapons before they enter hospital premises. These early findings support the potential of WSP as a critical safety intervention in vulnerable areas not amenable to traditional metal detectors, providing a model that could be replicated in other healthcare facilities to safeguard both staff and patient welfare. The continued monitoring and refinement of this protocol will be essential to maximizing its effectiveness and ensuring a secure hospital environment.

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348 Opioid Safety Events in Unmonitored Emergency Department Areas: A Two-Year Retrospective Analysis of Duke Emergency Patients

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Background: The post-pandemic period has led to significant changes in emergency department (ED) operations. Increased patient volumes and the boarding of hospital admissions have necessitated the expansion of care into unmonitored areas such as triage rooms, hallways, and waiting rooms. Providing effective opioid pain management to patients in unmonitored areas has created safety concerns. Opioid analgesics are essential for managing severe pain events in the ED, but their use carries inherent risks. The primary concerns are oversedation and respiratory depression, with potential life-threatening consequences if not promptly recognized and treated. This study examines the safety of the use of opioid medications in unmonitored areas of the ED.

Methods: This cross-sectional study analyzed data from patients seen in a university hospital ED between January 2022 and December 2023. Inclusion criteria consisted of patients who received any dose, frequency, or route of administration of any opioid-containing medication(s) in areas without continuous vital sign monitoring capability (ie, triage, hallway, waiting room). In these areas, patients were monitored by standard vital sign and visual assessments, but not by continuous cardiac or respiratory monitoring. The administration of naloxone after opioid administration was used as proxy for determining a safety event. Data was extracted from the electronic medical record (EMR).

Results: In the two-years of data collection, 11,732 patient encounters received an opioid in an unmonitored area. The average age was 47 years. 54% were ESI 3 presentations. The most common chief complaint was abdominal pain, at 27%. The hospital admission rate was 35%. The most frequent opioid used was IV hydromorphone at 38%. The area where patients most frequently received the opioid medication was a triage room, at 64%. Among all patients, 7 received naloxone at any time during their ED stay. Time between initial opioid dose and naloxone administration ranged between 4 and18 hours. Only one patient required emergent naloxone while in an unmonitored area, representing an adverse event rate of 0.009%. Notably, this patient presented for acute on chronic respiratory failure, so it is unclear to what extent the opioid medication contributed to this patient's respiratory depression.

Conclusion: This two-year, retrospective analysis demonstrates a very low complication rate for opioid administration in unmonitored areas, suggesting opioid administration in these settings is exceedingly safe. One limitation is opioid dose and frequency was not assessed. Another limitation of our study is that vital signs are not continuously collected in unmonitored areas, so it is not possible to detect minor changes in SpO2 and sedation after opioid administration. Despite this limitation, the

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necessity for naloxone serves as a clinically meaningful outcome that effectively captures significant adverse events.

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349 Evaluating the Efficacy of ChatGPT in Generating Discharge Instructions for Common Pediatric Emergency Conditions

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Study Objectives: This pilot study aimed to determine the ability of Large Language Models (LLMs), specifically ChatGPT-4 and ChatGPT-3.5, to generate discharge instructions for pediatric emergency medicine that meet recommended reading levels. It sought to compare these Artificial Intelligence (AI)-generated instructions with existing discharge materials from Elsevier to evaluate their efficacy and potential as tools for quick, personalized patient education material generation. The literature notes that ideal discharge instructions are most effective when shorter and at the sixth-grade reading level.

Methods: The study involved generating discharge instructions using ChatGPT-4 and ChatGPT-3.5 for the top 10 most common pediatric conditions identified through data review from the Agency for Healthcare Research and Quality. These conditions included upper respiratory infections, bruises, fever, and more. A prompt was generated around the ideal elements and reading level of discharge instructions, per the Centers for Medicare & Medicaid Services. After data collection, readability assessments were conducted using several validated scales such as the Flesch-Kincaid, SMOG, Gunning-Fog, Coleman Liau, and Automated Readability Index. The outputs were compared against standard EMR discharge instructions from Elsevier in terms of word count and reading level. The newly generated materials were also evaluated by physicians for accuracy and appropriateness.

Results: The study found that LLM generated instructions were significantly more concise ($p<.001$), with ChatGPT-4 and ChatGPT-3.5 producing an average word count of 315 ± 31 and 376 ± 41 words respectively, compared to 909 ± 302 words for the original EMR instructions. Despite this conciseness, the readability levels did not meet the target sixth-grade level, with ChatGPT-4 averaging a 7.71 ± 0.052 grade level and ChatGPT-3.5 at a considerably higher 10.88 ± 0.83 grade level. The original EMR instructions had a mean reading grade level of 7.22 ± 0.63. Physician evaluation is currently underway, with data available prior to presentation.

Conclusion: While ChatGPT models demonstrated the capability to produce more concise discharge instructions than traditional EMR systems, neither the LLMs nor original instructions achieved the sixth-grade reading level recommended for optimal caregiver comprehension. ChatGPT-4 performed closer to target readability levels compared to ChatGPT-3.5. This study highlights the potential and limitations of using LLMs for creating patient discharge instructions in pediatric emergency contexts, suggesting that further refinement may meet readability standards effectively and function well in a clinical setting.

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350 Emergency Medicine Around the World: Analysis of the 2023 American College of Emergency Physicians International Ambassador Country Reports

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Study Objectives: The specialty of emergency medicine (EM) is in different stages of development around the world. We conducted a survey of American College of Emergency Physicians (ACEP) International Ambassadors in 2023 in order to document the growth and current state of emergency around the world.

Methods: This was a descriptive, cross-sectional survey with 66 items covering EM specialty development, training, and working conditions. Data were collected digitally from January to September 2023 via Qualtrics. Ambassador teams for each country submitted responses based on personal experience, correspondence with local contacts, and publicly available data. Population and income data were sourced from the United Nations Statistics Division, the World Bank, and the World Health Organization. Data was analyzed in aggregate and by region and income level. We also compared results to those of the last survey in 2019.

Results: We obtained 69 responses out of 77 countries with ACEP Ambassadors (90%), representing 76% of the estimated global population. No significant differences were found in income levels between respondents and nonrespondents ($p=0.73$). EM was a recognized specialty in 63/77 respondent countries (91%) compared to 54/63 (86%) in 2019. Fifty-nine countries have a national emergency medicine society (86%), with 64% reporting national goals for emergency care. In 2023, 57% of respondent countries offered an emergency physician certification exam, up from 48% in 2019. There were a total of 113,254 EM residency trained physicians (EMRTPs) compared to 65,097 in 2019. These EMRTPs worked in 77,563 emergency departments, in 57 countries caring for a total population of 6.017 billion. The global number of EMRTPs per 100,000 population was 1.9 (by country: median 0.9, range 0 - 19.3). Higher country income was associated with a higher number of EMRTPs per capita ($p=0.001$), a similarly significant finding in 2019. Sixty countries (87%) had EM residencies, totaling 1790 programs globally (median=5, mean=31 programs per country). Nearly one third of countries have only one EM training program. Residency duration ranges from 24 to 84 months, with a median of 48 months, with time spent in an emergency department varying from 13% to 100%. Twenty-seven surveyed countries (39%) offered subspecialty or fellowship training, an increase from 35% in 2019. Fifty-five percent of respondents report that more than half of their EMRTPs work in rural areas, while 13% report EMRTPs exclusively in urban settings. Additionally, twenty respondents (29%) offer EM training for mid-level providers, and 39 (57%) provide specialized EM training for nurses.

Conclusion: Emergency medicine continues to grow as a specialty globally. In the past several years there have been more countries recognizing the specialty of EM as well as developing EM board exams. There has been growth in the number of EM residency programs and EMRTPs in practice. Most countries surveyed recognized EM as a specialty and many more EMRTPs were reported compared to 2019. Nonetheless, the number of EMRTPs per capita remains low around the world and EMRTPs are more prevalent in higher income countries.

Country	Population (millions)	World Bank Income Group	#EDs in Country	National Society	EM Recognized Specialty	Year EM recognized	Duration EM Residency (mo)	RTPs working	EM RTPs /100k population	EM residencies	EM Residencies /1MM population	EM Board Certification
Africa Region												
Botswana	2.44	Upper middle income	31	No	Yes	2011	48	6	0.25	1	0.41	Yes
Ethiopia	105.03	Low income	15	Yes	Yes	2009	36	100	0.10	Missing	Missing	No
Kenya	50.62	Lower middle income	50	No	Yes	2013	24	10	0.02	2	0.04	Yes
Liberia	3.48	Low income	15	No	No	n/a	n/a	n/a	n/a	n/a	n/a	Missing
Libya	5.3	Upper middle income	29	Yes	Yes	2009	48	10	0.19	10	1.89	Yes
Malawi	19.35	Low income	1	No	Yes	2010	48	4	0.02	1	0.05	No
Mozambique	31.62	Low income	89	No	Yes	2016	48	7	0.02	1	0.03	Yes
Nigeria	216.78	Lower middle income	879	Yes	Yes	2019	72	4	0.00	2	0.01	No
Rwanda	13.25	Low income	4	Yes	Yes	2013	48	14	0.11	1	0.08	No
Uganda	44.21	Low income	18	Yes	Yes	2017	36	10	0.02	2	0.05	No
America Region												
Argentina	46.23	Upper middle income	100	Yes	Yes	2010	48	500	1.08	42	0.91	Yes
Belize	0.44	Upper middle income	10	No	Yes	2021	n/a	n/a	n/a	n/a	n/a	Missing
Bolivia	12	Lower middle income	91	Yes	Yes	1999	36	81	0.68	7	0.58	No
Brazil	214.83	Upper middle income	860	Yes	Yes	2014	24	500	0.23	54	0.25	No
Canada	38.93	High income	1300	Yes	Yes	1980	60	3000	7.71	31	0.80	Yes
Chile	18.83	High income	500	Yes	Yes	2013	36	681	3.62	11	0.58	No
Colombia	51.68	Upper middle income	300	Yes	Yes	2005	42	450	0.87	8	0.15	No
Costa Rica	5.21	Upper middle income	136	Yes	Yes	1993	36	130	2.50	1	0.19	No
Cuba	11.1	Upper middle income	150	Yes	Yes	Missing	48	2000	18.02	13	1.17	Yes
Dominican Republic	10.62	Upper middle income	612	Yes	Yes	2000	48	480	4.52	20	1.88	No
Ecuador	18.09	Upper middle income	70	Yes	Yes	1993	48	300	1.66	3	0.17	No
El Salvador	6.53	Upper middle income	98	Yes	Yes	2021	36	4	0.06	2	0.31	No
Guatemala	17.36	Upper middle income	200	Yes	Yes	2018	36	8	0.05	2	0.12	No
Guyana	0.75	High income	6	No	Yes	2011	36	19	2.53	1	1.33	Yes
Haiti	8.37	Lower middle income	35	Yes	Yes	2017	36	25	0.30	1	0.12	No
Honduras	9.45	Lower middle income	28	No	No	n/a	n/a	n/a	n/a	n/a	n/a	Missing
Jamaica	2.7	Upper middle income	15	Yes	Yes	2001	48	Missing	Missing	1	0.37	Yes
Mexico	130.12	Upper middle income	4718	Yes	Yes	1986	36	5000	3.84	75	0.58	Yes
Panama	4.4	High income	40	Yes	Yes	1998	48	47	1.07	2	0.45	Yes
Peru	33.4	Upper middle income	395	Yes	Yes	1984	42	664	1.99	37	1.11	No
Trinidad and Tobago	1.37	High income	23	Yes	Yes	2015	60	30	2.19	1	0.73	Yes
USA	331.89	High income	4547	Yes	Yes	1972	42	65000	19.58	282	0.85	Yes
Eastern Mediterranean Region												
Egypt	103.61	Lower middle income	250	Yes	Yes	2001	48	450	0.43	17	0.16	Yes
Jordan	11.06	Lower middle income	156	Yes	Yes	2003	48	109	0.99	5	0.45	Yes
Oman	4.98	High income	5	Yes	Yes	1999	60	50	1.01	1	0.20	Yes
Pakistan	207.77	Lower middle income	1500	Yes	Yes	2008	60	30	0.01	11	0.05	Yes
Palestine	5.35	Upper middle income	55	Yes	Yes	2013	48	9	0.17	5	0.93	Yes
Yemen	19.69	Low income	3700	Yes	Yes	2004	48	120	0.61	2	0.10	Yes
European Region												
Armenia	2.97	Upper middle income	5	No	No	n/a	n/a	n/a	n/a	n/a	n/a	Missing
Austria	8.93	High income	271	Yes	No	n/a	n/a	n/a	n/a	n/a	n/a	Missing
Germany	84.08	High income	1075	Yes	No	n/a	24	0	0	0	0.00	Yes
Greece	10.68	High income	423	Yes	Yes	2018	n/a	n/a	n/a	n/a	n/a	Missing
Hungary	9.68	High income	70	Yes	Yes	2003	60	202	2.09	Missing	Missing	Yes
Iceland	0.38	High income	4	Yes	Yes	1992	72	25	6.58	1	2.63	Yes
Ireland	5.01	High income	29	Yes	Yes	1962	84	420	8.38	1	0.20	Yes
Israel	9.37	High income	28	Yes	Yes	1999	54	200	2.13	21	2.24	Yes
Italy	59.24	High income	1300	Yes	Yes	2008	60	750	1.27	33	0.56	No
Poland	38.06	High income	246	Yes	Yes	1999	60	1300	3.07	172	4.52	Yes
Russian Federation	146.86	High income	13	Yes	Yes	1982	24	0	0	2	0.01	No
Spain	47.33	High income	400	Yes	No	n/a	n/a	n/a	n/a	n/a	n/a	Missing
Turkey	84.68	Upper middle income	105	Yes	Yes	1993	48	2000	3.17	114	1.34	Yes
Ukraine	41.17	Lower middle income	50	Yes	Yes	Missing	24	1200	2.91	20	0.49	Yes
United Kingdom	67.33	High income	235	Yes	Yes	1972	48	1000	1.63	5	0.07	Yes
Switzerland	8.7	High income	100	Yes	Yes	Missing	n/a	n/a	n/a	n/a	n/a	Missing
South-East Asian Region												
Bhutan	0.76	Lower middle income	4	No	Yes	2015	48	5	0.66	1	1.32	No
India	1367.17	Lower middle income	500	Yes	Yes	2009	36	1000	0.07	200	0.15	Yes
Indonesia	275.27	Lower middle income	4	Yes	Yes	2017	48	70	0.03	1	0.00	Yes
Nepal	30.38	Lower middle income	125	Yes	Yes	2017	n/a	n/a	n/a	n/a	n/a	Missing
Thailand	23.83	High income	901	Yes	Yes	2004	36	1000	4.20	25	1.05	Yes
Western Pacific Region												
Australia	25.98	High income	1300	Yes	Yes	1991	60	5000	19.25	140	5.39	Yes
Cambodia	16.84	Lower middle income	100	Yes	Yes	1993	48	30	0.18	1	0.06	Yes
China	1411.75	Upper middle income	3870	Yes	Yes	1986	36	11000	0.78	50	0.04	Yes
Japan	125.13	High income	4000	Yes	Yes	1983	42	5000	4.00	250	2.00	Yes
Lao PDR	7.44	Lower middle income	102	Yes	Yes	2016	42	25	0.34	1	0.13	Yes
New Zealand	5.12	High income	35	Yes	Yes	1995	60	200	3.91	19	3.71	Yes
Papua New Guinea	9.12	Lower middle income	45	Yes	Yes	2017	60	20	0.22	1	0.11	Yes
Philippines	113.57	Lower middle income	1000	Yes	Yes	2009	48	500	0.45	21	0.19	Yes
Republic of Korea	51.63	High income	404	Yes	Yes	1989	48	1700	3.29	55	1.07	Yes
Vietnam	99.46	Lower middle income	1000	Yes	Yes	2012	24	30	0.03	1	0.01	No
	≤10	High income	1-20	Yes	Yes	≤1989	≤24	1-25	0.01-0.49	1-5	0.01-0.19	Yes
	11-24	Upper middle income	21-100	No	No	1990-1999	25-36	26-200	0.5-0.99	6-25	0.20-0.99	No
	25-99	Lower middle income	101-999			2000-2009	37-48	201-499	1.0-1.9	26-99	1.00-1.99	
	100-999	Low income	1000-1999			2010-2019	≥49	500-999	2.0-4.9	≥100	≥2.0	
	≥1000		≥2000			≥2020		≥1000	≥5	0	0	
						Missing		0	0	Missing	Missing	
						n/a		Missing	n/a	n/a	n/a	
								n/a				

No, authors do not have interests to disclose

351 Physician Self-Scheduling Trial for a Large Academic Multi-Site Emergency Department

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Background: Physician self-scheduling has been successful in a small academic emergency department, but the feasibility of such a process in a larger department with multiple sites has not been reported. From June-July 2023, our academic ED comprised of 150 faculty members working at three clinical sites, attempted physician self-scheduling with the goals of improving transparency, equity, and satisfaction with the physician schedule. The trial was ultimately discontinued. The objective of our study was to analyze why the self-scheduling process did not succeed in generating a publishable physician schedule and factors that could be modified by other large EDs seeking to trial a physician self-scheduling process.

Methods: A 60-minute focus group consisting of 4 emergency physicians and 2 ED schedule administrators who were charged with leading the self-scheduling pilot was conducted via Zoom by a facilitator who was not involved in the pilot. Transcripts from the focus group were analyzed by two raters using qualitative data analysis software (QDAS) and a combination of deductive and inductive coding. To ensure that themes occurring in focus group responses were representative of the perspectives of the entire faculty, a series of 12 structured interviews was performed with participants in the self-scheduling trial approximately equally distributed across each of our three clinical sites. Results of these interviews were coded using the codebook developed from the focus groups and prioritize focus group themes.

Results: Physicians identified the purpose of the self-scheduling trial as an attempt to address dissatisfaction with our current scheduling process and to give faculty the opportunity for greater control and ownership. Self-scheduling was conducive to a more equitable distribution of shifts (nights, weekends, residency conference mornings, teaching vs non-teaching shifts). The transparency of self-scheduling also heightened physician awareness of the difficulties of schedule creation and the scheduling needs of colleagues. However, several barriers to implementation were identified: lack of faculty buy-in and engagement, lack of clarity in communication of the process during its rollout phase, the challenge of self-scheduling over multiple rounds and managing data using Microsoft Excel spreadsheets, and the time required to self-schedule. The size of our department, the variable needs of each clinical site, and the limitations of our current scheduling software were also noted.

Conclusion: The physician schedule is a central concern of clinical academic operations. Lessons learned from our group's experience may inform other academic EDs seeking to trial a physician self-scheduling process.

No, authors do not have interests to disclose

352 The Home Team Is in Town! The Emergency Department and Emergency Medical Services Will Be Nice and Quiet, Right?

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Study Objectives: Optimizing staffing in the emergency department (ED) and in the prehospital environment allows for a balancing of clinical care and proper resource utilization. There is a belief within ED/EMS centers that days during which a professional sporting event occurs, they will have greater patient volumes. Prior studies have evaluated the effect of National Football League game days versus non-game days, but limited data exists comparing home versus away game days. Our study evaluated ED visit volumes, EMS call volumes, and EMS trip volumes on days when the Atlanta Falcons played in Atlanta, Georgia and on days when they played an away game. Additionally, we evaluated the association between home game attendance and ED visit volume, EMS call volume, and EMS trip volume.

Methods: Using the Atlanta Falcons schedules between 2014-2023, retrospective data were obtained for all dates where the Falcons were playing either home or away games. The 2020 season was excluded due to COVID restrictions. ED volume data were obtained for Grady Memorial Hospital, which is both a Level 1 trauma center and the hospital nearest to the Atlanta Falcons stadium. EMS volume included Grady Atlanta Emergency Medicine Services. A Poisson regression was used to compare home and away games. Spearman correlations were used to evaluate the association between home game attendance and ED volume, EMS call volume, EMS trip volume, and call-adjusted EMS trip volume.

Results: With respect to home versus away game days, only call-adjusted EMS trip volume reached statistical significance (RR=0.979, 95% CI = 0.955 - 0.999). No difference was seen in EMS trip volume, EMS call volume, or ED volume for home versus away games. The correlations between EMS trip volume (r = 0.36, 95% CI 0.16-0.51), call-adjusted EMS trip volume (r = 0.28, 95% CI 0.07-0.45), and ED volume (r = 0.31, 95% CI 0.12-0.47) and Atlanta Falcons home game attendance were all significant (Table). The correlation did not reach significance for EMS call volume.

Conclusion: There was minimal to no difference in ED or EMS volumes when the Falcons were playing home versus away games. However, game attendance volume correlated with ED volume and EMS volume. Our single-center findings suggest that staffing on home games may not need to change unless the game attendance is higher than average, such as a highly anticipated game. Future directions may investigate the impact of team win-loss records on ED and EMS volumes and hour-to-hour volume variations during game days.

Table 1. Correlation of attendance at Atlanta Falcons home football games with Grady Atlanta Emergency Medical Services (EMS) trip and call volume and Grady Memorial Hospital Emergency Department (ED) volume.

Outcome	r	95% CI
EMS Trips	0.36*	0.16 - 0.51
EMS Trips (Call Adjusted)	0.28*	0.07 - 0.45
EMS Calls	0.12	-0.09 - 0.29
ED Volume	0.31*	0.12 - 0.47

*p<0.05, r = correlation coefficient, CI = confidence interval.

No, authors do not have interests to disclose

353 Relative Productivity: A Data Driven Equitable Productivity Model

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Study Objectives: Emergency Physicians of Tidewater is a democratic emergency physician group located in Norfolk, VA that staffs seven emergency departments. Its staffing model includes attending physicians, physician assistants (PAs) and resident physicians. The Group sought to create the most fair and equitable productivity model that accounted for variations between physician staffing (individual patients, resident and physician assistant (PA) patients staffed with the individual attending physician), relative value unit (RVU) generated, shift type worked (day and night), and emergency room type (urban, suburban, free-standing, or academic) as well as patient volumes. It derived the model for relative productivity based on these factors.

Methods: Individual physician's total hourly performance (individual patient per hour, individual RVU per hour, total patients per hour (individual patients seen plus patients staffed with the attending physician by a resident and/or PA), and total RVU per hour (individual worked RVU plus worked RVU generated by patients staffed with the attending physician by a resident and/or PA) was collected and evaluated over two years for the entire group. Relative productivity is calculated for a single provider by using the formula (total physician visits or RVUs)/(total benchmark visits or RVUs). The average benchmark visits or RVUs for a provider are the average total patients or RVUs/hour of other providers who worked the same shifts at the same departments with the same staffing setup. Then, the total benchmark visits or RVUs is (number of total hours of the provider x the average patients or RVUs/hour for all physicians that worked at a facility in the same amount of hours). This was compared to the relative productivity of physicians who primarily work at each site (core) which is calculated by (total physician visits or RVUs/total core benchmark visits) to determine the productivity of a single physician relative to all who primarily work at a single site. The physician's total relative productivity is their cumulative performance at all facilities compared to the total average of all physicians at the facilities where the physician worked. To account for variations in staffing for PA patients a linear model to estimate the attestation rate for PA patients was created.

Results: Relative productivity was determined to be the most fair and equitable model for comparing productivity between individual physicians across the seven emergency departments when compared to using standard averages of the individual hourly performance even with setting parameters with standard deviations. It was determined that there was significant variability between day and night shifts in relative productivity so that these shifts were compared separately for productivity purposes. Statistical analysis evaluated for correlation between individual patient per hour,

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individual RVU/hr, total patients/hour, total RVU/hour based on all hospitals and day versus night shift within the relative productivity model. The range in correlation analysis when comparing individual patients per hour, total patients per hour, individual RVUs per hour and total RVU per hour was 99.52% - 99.69% for day physicians and 99.88-99.94% for night physicians.

Conclusion: Relative productivity is a fair and equitable model that has a high correlation analysis between individual patients per hour, individual RVU per hour, total patients per hour and total RVU per hour when accounting for different emergency departments and staffing models.

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354 Evaluating Outcomes of Patients With Suspected Pulmonary Embolism Using an Age-Adjusted Cutoff for a D-dimer Unit (DDU) Based Assay

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Study Objectives: Recent studies have suggested that employing an age-adjusted D-dimer threshold could enhance specificity, potentially reducing unnecessary CT scans without increasing the risk of missed pulmonary embolism (PE) cases. D-dimer, a breakdown product of fibrin clots, is typically measured in fibrinogen equivalent units (FEUs) with a standard cutoff of 500 ng/ml. Some laboratories utilize D-dimer units (DDUs) with a lower cutoff (eg, 230 or 250 ng/ml) due to different calibration methods involving either purified D-dimer or fibrinogen. Only two studies to date have investigated age-adjusted D-dimer (using a formula of age x 5 ng/L) with DDU-based assays, reporting increased specificity without missed PE cases. This study aims to assess the specificity of an age-adjusted DDU-based assay in diagnosing PE among 1831 patients who underwent D-dimer testing followed by CT angiography (CTA).

Methods: This retrospective observational cohort study was conducted at a single urban emergency department (ED). We analyzed patients with suspected PE who underwent D-dimer testing followed by CTA. We presumed that D-dimer testing was appropriately ordered for "low-risk" patients as per Wells criteria, which was prompted by the electronic medical record (EMR) before CTA ordering. Patients were considered positive if CTA revealed any PE, as determined by the attending radiologist. We excluded patients who did not undergo CTA. Our lab employs the HemosIL D-Dimer HS reagent reporting D-dimer values in DDU ng/ml with a 230 ng/dL cutoff. Patients aged 50 and above had their D-dimer values retroactively adjusted using age x 5 ng/L.

Results: Out of 1,831 patients, 228 were diagnosed with PE, giving a prevalence rate of 12.45%. The conventional D-dimer cutoff resulted in 6 missed PE in this population. This gave the unadjusted cutoff of 230 ng/dl a sensitivity of 97.4%, specificity of 7.3%, positive predictive value (PPV) of 13%, and negative predictive value (NPV) of 95.1%. For patients over the age of 50, we then retroactively adjusted each patient's D-dimer. The adjusted D-dimer would have resulted in 152 (8.3%) avoidable scans. These are patients whose D-dimer went from positive to negative after age adjustment. The adjusted D-dimer could have resulted in three cases (1.3%) of missed PE. The sensitivity of the adjusted d-dimer is 96.1%, specificity 16.6%, PPV 14.1%, and NPV 96.7%. There was a 1.3% decrease in sensitivity when using age-adjusted cutoffs.

Conclusion: Age-adjusting DDU-based D-dimer assays could reduce unnecessary CTAs by 8.3% but may result in a slight increase in missed PE cases (1.3%). This contrasts with earlier studies that reported no additional missed cases with age-adjusted DDU assays . The study's limitations include its focus on patients who received CTAs, which differs from previous studies that tracked all D-dimer-receiving patients. Further research should explore this in a prospective manner, potentially implementing institutional changes to evaluate missed PE rates. Clinicians may consider age-adjusted DDU-based D-dimer assays to aid in reducing CT usage as long as test characteristics are understood.

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355 Thematic Analysis of Emergency Medicine Residents' Concerns Facing the Specialty of Emergency Medicine

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Study Objectives: This study aimed to identify the most important concerns identified by residents facing the specialty of emergency medicine (EM).

Methods: We conducted a cross-sectional study of EM residents in categorical, ACGME-accredited programs who completed the ABEM in-training exam (ITE) and took a voluntary, de-identified survey after the examination. Residents from international or combined training and those who did not complete the voluntary post-ITE survey were excluded. In addition to demographic information, residents we were asked to provide a free-text listing of the 2-3 most important topics facing the specialty that ABEM should explore and further research. A qualitative thematic analysis was conducted to identify common themes across the responses. After classifying the responses, theme frequency was tested for statistical significance across the program level junior (years 1 and 2) and senior (years 3 and 4) of the responder using the chi-square test.

Results: Of the 9,485 EM who took the ABEM ITE, 8,065 (85%) completed a post-ITE survey. Three thousand, two hundred and 24 responders (61% males, 60% junior residents) provided 4,696 comments. There were no demographic differences between responders and non-responders. The thematic analysis yielded the following common concerns in decreasing frequency: 1. Work Environment: overcrowding, boarding in the ED, provider safety, burnout, and the rise of waiting room medicine; 2. Scope of Practice: Non-physician providers and the expansion of the scope of practice for physician assistants and nurse practitioners; 3. Ownership and Control: for-profit business and private equity control over emergency medicine groups and training programs;5. Role of Artificial Intelligence; and 6. Advocacy and Representation: the need for unionization of physicians and residents. Junior residents were more likely to have concerns about Work Environment (2.6-5.4 95% CI, $p<0.0001$), and senior residents were more likely to report concerns about Scope of Practice (1.6-3.4 95% CI, $P<0.0001$). There was no statistically significant difference in issues reported by gender. Figure 1 is a word cloud of participant responses.

Conclusion: The study provides insights into the primary concerns among emergency medicine residents, with "Work Environment" being the most prevalent issue, followed by "Scope of Practice" and "Ownership and Control". These themes highlight areas where further study to improve the working conditions and practice standards in emergency medicine may be warranted.

No, authors do not have interests to disclose

356 Variation in Duration of Emergency Department Boarding by Patient Demographics

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Study Objective: Emergency department (ED) boarding, by which admitted patients receive care in the ED while awaiting an available inpatient bed, increasingly strains capacity and negatively affects patient outcomes. Boarding has been linked to an increase in ED length of stay, hallway care, poor patient satisfaction, longer hospital stays, and higher mortality. Prior research found capacity metrics like hallway care were inequitably allocated based on patient race and ethnicity, however it is unknown whether boarding patterns vary significantly based on these characteristics. We examined whether duration of ED boarding varied significantly based on patient demographics.

Methods: This single-center cohort study included consecutive adult ED patients who boarded in the ED after admission to the non-intensive care inpatient medicine service between February 2020 to February 2023 at an urban academic tertiary hospital with >110k annual ED visits. Primary outcome was time from admission order to

transport to inpatient bed. Patient demographics (age, sex, race, ethnicity, language, insurance, and housing status), visit characteristics (emergency severity index, time, and day), and bed request features (telemetry, sitter need, and active isolation precaution) were obtained via the electronic medical record. We examined these using mean or median, depending on distribution for continuous variables, and proportion for categorical variables. We assessed for bivariate relationships between boarding time and patient demographics with descriptive statistics and analysis of variance (ANOVA). We used both adjusted and unadjusted regression analyses with generalized estimating equations (GEE) to account for patient level correlation (Software R version 4.3.1).

Results: A total of 22,291 encounters were included in analysis, for which 97% boarded 120 minutes, with a mean duration of 21 hours, and 35% boarded >24 hours. Average patient age was 64 (SD 19) years and 47% were female. Approximately 12% identified as Hispanic, 70% as non-Hispanic White, and 10% as non-Hispanic Black, with non-English primary language speakers comprising 15% of encounters. Most had Medicare coverage (43%), followed by commercial insurance (39%), and Medicaid (17%); 5% had non-permanent housing status. Based on GEE analyses, non-Hispanic Black-identifying patients boarded 19 minutes longer (95% CI -27.66, 65.26) and non-English primary language speakers boarded 20 minutes longer (95% CI -12.43, 51.82) than Hispanic-identifying patients and English primary language speakers respectively, although these findings were not statistically significant. Patients aged 65-years waited 46 minutes longer than younger patients (95% CI 19.05, 72.64, p=0.001), and those with Medicaid insurance waited an additional 52 minutes compared with those covered by commercial carriers (95% CI 18.14, 85.55, p=0.003).

Conclusion: Among adult patients admitted to medicine, advanced age and Medicaid insurance were significantly associated with longer ED boarding, whereas race/ethnicity and primary language were not. Nearly all patients waited longer than 2 hours for their inpatient bed, and more than one-third of patients waited >24 hours. Further study should determine whether these findings are replicated in other ED settings, how this impacts patients, and if targeted intervention can reduce inequities.

No, authors do not have interests to disclose

357 The Use of a Data Mart for the Instantaneous Availability of Emergency Department Clinical Information

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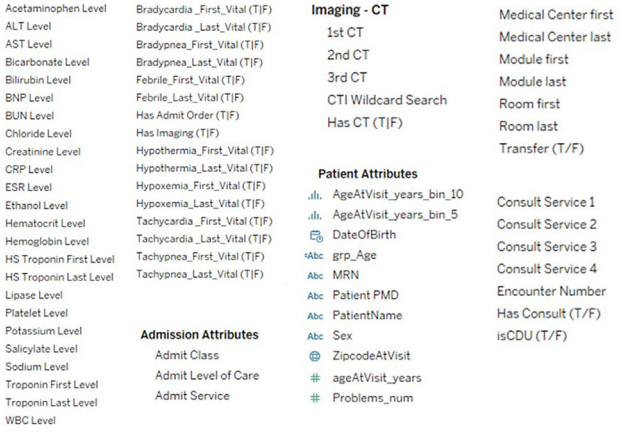
Study Objectives: We aim to outline a method of zero latency data reporting for real-time emergency department (ED) operational uses. This approach can also be employed for research, quality improvement, process improvement and other initiatives within an ED.

Methods and Results: This is a report on the creation of a data mart from the Epic Clarity database, a relational database that tracks clinical data from an electronic health record. It was created for the use of an emergency department in Southern California that encompasses three clinical sites, has an emergency medicine residency program, an emergency point-of-care ultrasound fellowship and is a core ED site for its medical school. This data mart has been customized for the most relevant ED clinical information from each encounter. The only source system is the Epic Clarity database, deploying custom scripts to extract relevant information. In ED operations, certain clinical information is often repeatedly queried from a database for various departmental needs. The latency of these reports is quite variable and for many EDs is dependent on a separate analytical team. Our method allows for a physician informatician to employ this data in real time, as well as create online dashboards for non-informatician leaders to utilize in a similar fashion. In addition, much of traditional emergency medicine reporting includes timestamps and intervals. This is likely secondary to the ED being a high cost care space, as well as its ease of data retrieval, analysis and presentation. We believe that clinical information is (at least) as important as ED logistical/timestamp information. The data mart is updated nightly and spans 10 years with greater than one million ED visits. It functions at the encounter-level. Each entry includes up to 21 ED timestamps, corresponding to the ability to monitor greater than 200 unique and potentially relevant ED intervals. Examples of ED intervals include door to doctor time and total length of stay. It also includes admission attributes, arrival modes, chief complaints, disposition, coding, location data within the ED (ie, which ED if multiple, modules, and rooms), and patient demographics (ie, name, gender, zip code, MRN, date of birth, age at visit, various age bins, and primary care physician). Incorporated in the data mart are clinically relevant data points including vital signs, diagnoses, emergency severity index (ESI), imaging information, laboratories including both discrete and continuous values, problem lists, and consults from each visit. Figure 1 illustrates example elements from the data mart.

Conclusion: Ultimately, approximately 150 unique, clinical data points from an ED visit can be utilized to empower ED administrators and researchers to delve deeper into data analytics, uncovering patterns used to sharpen decision making. More significantly, this information is available virtually instantaneously. The data mart can be the foundation for numerous analytical engines and advanced algorithms. In real time, an analyst or physician leader can extract actionable intelligence, further driving improvement, resource allocation and operational efficiency.

Figure 1: Sample Elements of Data Mart



No, authors do not have interests to disclose

358 Reduction in Emergency Department Length of Stay and Head CT Utilization With Implementation of Brainscope in Head Injury Evaluation

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Study Objectives: Brainscope (BSc) is an FDA cleared non-invasive device utilizing AI and machine learning derived algorithms of brain electrical activity to assist clinicians in likelihood determination of intracranial hemorrhage (ICH) and head CT utilization after trauma. The objectives of this diagnostic implementation project are: (1) ED LOS impact; (2) Head CT utilization impact; (3) Operator satisfaction; (4) Patient satisfaction.

Methods: This prospective implementation study was conducted 12/2022-5/2023 at an urban 85K visit regional trauma center. The subjects are a convenience sample of ambulatory patients with head injury meeting inclusion criteria of: (1) 18-85 y/o, GCS 13-25, <72hrs from injury, (2) 2-17 y/o, GCS 14-15, <24hrs from injury who are candidates for head CT based on clinician impression. A trained group of clinicians performed the BSc diagnostic POC testing and recorded data on these subjects that was entered into Microsoft Excel. The data recorded was patient demographics, injury timing and cause, structural injury classifier (SIC) score, brain function index (bfi) score, test performance time, operator impression of ease of patient prep and use of the device on a 5 point Likert scale, patient satisfaction and recommendation of use with receiving a BSc on a 5 point Likert scale, probability of CT use in absence of BSc availability. Other recorded data was emergency department (ED) LOS and time to CT if performed. Retrospective matched pairs of subjects with similar demographics and ED visits during the study period as the BSc group who: (1) received head CT after head injury and (2) discharged directly from the ED with head injury and no CT were derived from query of the Allscripts EHR. Analysis was performed with descriptive stats, basic sample stats, and 2 sample T-test with significance p<0.05.

Results: The mean BSc testing time is 9.33 min (SD 3.9). Patient demographics: mean age 31.5 (SD 13.6); 39.5% male; injury presentation 60.5% <8h, 39.5% 8-72h; cause of injury, mvc 44% fall 28% sports 7% other 21%. Operator satisfaction: (1) Ease of prep of patient median 5=very easy (avg=4.8); (2) Ease of use of device median 5=very easy (avg=4.9). Patient satisfaction: (1) Satisfaction with BSc

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experience median 5=highly (avg=4.7); (2) Recommend Bsc to family/friends median 5=strongly agree (avg=4.8). The avg ED LOS times: Head injury no CT 124m (SD 91); Head injury + CT 255 min (SD 120). There were 24/43 subjects with neg SIC and no recommendation for head CT, 56% CT order reduction & ED LOS 197m (SD 85), BSc with "equivocal" or "evaluate" LOS 289m(SD 145). LOS comparison: Bsc neg SIC vs head injury/CT P=0.017; Bsc equivocal/evaluate SIC vs head injury/CT p=0.43; BSc with neg SIC vs No Ct & ED DC p=0.0022.

Conclusion: Use of the BSc in the ED reduced CT utilization by 56% and reduced ED LOS by almost 23% for patients evaluated for head injury with concern for ICH. ED LOS were not significantly increased in patients receiving BSc and being recommended for CT evaluation. The Bsc offers a POC solution for ICH evaluation that has superior operator and patient satisfaction scores.

No, authors do not have interests to disclose

359 Association of Test Utilization and the Emergency Department Provider Type

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Study Objectives: We aimed to compare the care provided by non-physician practitioners including physician assistants and nurse practitioners (also known as advanced practice providers or APPs), to the care provided by physicians in a lower acuity area of an emergency department (ED). There is conflicting evidence on resource utilization rates in EDs staffed by APPs compared to those staffed by physicians. Understanding the practice patterns of the two groups could provide valuable insights to guide staffing, training, and department workflow. This information is particularly relevant as some organizations currently advocate for independent APP practice.

Methods: The study was conducted in an urban, academic ED with approximately 85,000 adult visits annually. The study cohort consisted of patients seen in the lower acuity area ("Fast Track") of the ED between January 1, 2021 and July 25th, 2022. Patients missing basic demographic information or missing documented vital signs were excluded. The primary outcome measure of this retrospective data analysis was the difference in likelihood of ordering imaging, lab, and other diagnostic tests between the two types of providers. Secondary outcome measures include the length of stay for discharged patients, and admission or observation rates. Descriptive statistics and multivariate regression analysis with robust confidence intervals was used to analyze for differences in care practice between groups, adjusting for age, gender, emergency severity index, and Charlson comorbidity index.

Results: There were 41,143 ED visits that met inclusion criteria. The median age was 36 years old (Interquartile range 29-47); 59% were female. Adjusted logistic regression showed patients treated by physicians had a lower likelihood of an imaging test being performed (OR 0.69, 95% CI, 0.64-0.74, P<0.001), lower likelihood of a lab test being performed (OR .90, 95% CI 0.83-0.98, P=0.01), and a higher likelihood of having an ECG performed (OR 1.39, 95% CI 1.27-1.52, P<0.001).

Conclusions: In this retrospective study of an ED Fast Track population in an urban, academic ED, patients managed by physicians were associated with lower likelihoods of having imaging and lab testing and a higher likelihood of having an ECG performed when compared to patients managed by APPs.

No, authors do not have interests to disclose

360 Does Emergency Department Treatment Daily Census Correlate With Patient-Hours of Care Provided: A Comparison of Data from Pre-COVID-19 (2018) to Post-COVID-19 (2022)

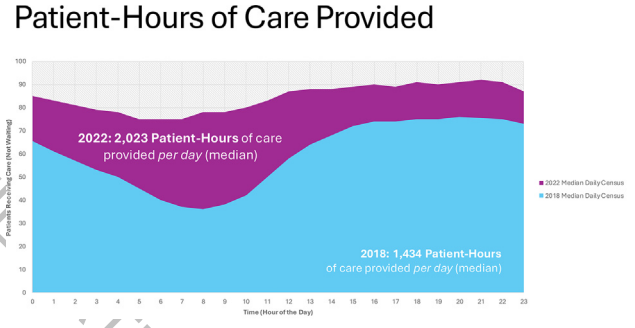
Patel M, Vajda P, Klausner H, Wanis N, Betham B/Henry Ford Hospital, Detroit, Michigan, US

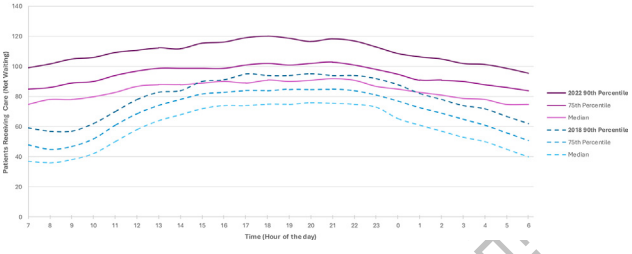
Study Objectives: Previous studies have shown that emergency departments (EDs) have had increased Length-of-Stay (LOS) and Boarding times following the COVID-19 pandemic, it is unclear how temporal fluctuations in patient volume have been affected. Further, we suspect that EDs are seeing fewer patients but are having to provide more patient hours of care with the same staffing levels. Previously, we have seen increases in typical operational metrics – Door to Doctor time, Left Without Completing services rate, and patients placed in Observation boarding–in a post-COVID-19 era, however the impact on ED throughput and resource utilization is unclear. We intend to demonstrate how differences in the daily ED volume and the patient hours of care delivered impact ED operations and to advise regarding staffing levels.

Methods: Patient encounters in the ED at a single urban tertiary care hospital in the years 2018 (baseline) and 2022 (comparator) were reviewed retrospectively. ED volume was quantified as the current treatment census over a twenty-four hour period over the course of the year and the median, 75th, and 90th percentiles were plotted for both years. The treatment census value was measured as the median and excluded waiting room census. Patient hours of care (PHOC) was derived by multiplying the median daily treatment census by the LOS and calculated for each hour of the day. Median patient hours of care was plotted for both years. Data was collected retrospectively from our electronic medical record (EPIC). The research was reviewed by our hospital's IRB and deemed exempt, and non-human subject research.

Results: In 2018, the median census in the emergency department was as low as 38 patients at 07:00 and peaked between hours of 15:00 till 23:00 where the median census was 77. In 2022, the median census in the ED was 75 at 07:00 and the peak census occurred between 12:00 until 23:00 at 90. In 2018, the median number of per day PHOC provided was 1,434 hours per day versus 2022 where it was 2,023 PHOC per day. That is 589 PHOC per day more delivered in 2022 than in 2018 despite an annual census of 101,132 patients in 2022 and 78,872 patients in 2018. In 2018, the total PHOC was 524,000 hours which per patient, was 5.2 hours per patient versus in 2022, where the PHOC was 740,000 hours which per patient was 9.3 hours.

Conclusions: In a post-COVID-19 era, our ED cared for fewer patients, delivered more patient hours of care per patient and experienced less throughput and maintained higher censuses at any point throughout the day. These findings are consistent with previous research on the operational impact of COVID-19 in the ED. These findings suggest that while most decisions on staffing utilize annual ED volume, patient hours of care could be a prudent metric to follow ED productivity.





No, authors do not have interests to disclose

361 Enhancing Critical Care Airway Management Quality Monitoring: Cumulative Summation Dashboard Approach

Je S, McGovern E, Deshpande S, Napolitano N, Gee K, Ronan L, Hu P, Nadkarni V, Nishisaki A/Children's Hospital of Philadelphia, Philadelphia, Pennsylvania, US

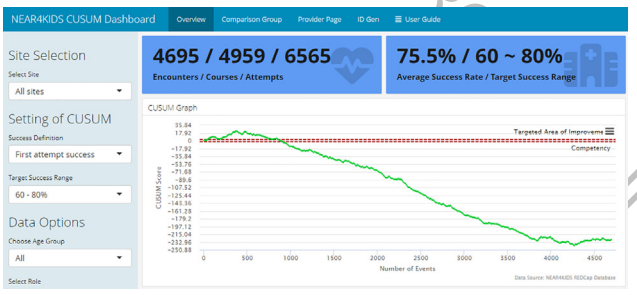
Study Objectives: Tracheal intubation in the Pediatric ICU is a high-risk procedure. We developed an innovative Cumulative Summation (CUSUM) dashboard

to visualize the first attempt success during intubations for critically ill children. The CUSUM dashboard with interactive functionality to categorize by patient and provider characteristics allows us to visualize ongoing quality and safety monitoring in the ICU for QI and research endeavors (Figure).

Methods: We used the Children's Hospital of Philadelphia's (CHOP) Pediatric airway QI registry, which has collected data since 2018, to track first attempt intubation success rates using the CUSUM dashboard. The CUSUM group graph was built for first attempt success with an interactive functionality to stratify the CUSUM graph by location, patient and provider characteristics. We a priori selected the following criteria for stratification: intubation location (pediatric ICU, cardiac ICU, emergency department), age group (infant, 1-7 year, 8-17 year), difficult airway history, and provider role (resident, fellow, attending, nurse practitioners, hospitalists).

Results: We built functionality in our CUSUM quality improvement dashboard to generate an interactive stratification by a priori selected criteria (Figure). We were able to visualize subgroup CUSUM curves. The first attempt success rate among patient age group were different (infant, 70.1%, 1-7 year child 80.5%, 8-17 year child 82.9%, p= p<0.001). Similarly, first attempt success rate significantly varied among location, difficult airway history, or provider roles (all p<0.001), Table 1. Multivariable logistic regression demonstrated independent association of each factors with first attempt success, Table 2.

Conclusion: The CUSUM dashboard with interactive functionality to categorize by location, patient, and provider characteristics allows us to visualize ongoing quality and safety monitoring in the ICU for QI and research endeavors. It effectively visualized different success rate across subgroups, offering actionable information for QI and educational intervention.



No, authors do not have interests to disclose

362 AIRWAY-MR: Assessing Traditional Intubation Didactics With a Novel Mixed Reality Module

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Background and Study Objectives: The goal of this study was to assess if Mixed Reality technology (MR) is comparable to traditional didactics in training new learners with the skills of intubation. This is a non-inferiority trial to establish the feasibility of an MR airway education module compared to traditional airway teaching. The study participants were twenty-one postgraduate year one (PGY1) physicians accepted to an emergency medicine residency program located in a large, urban setting. The residency program is located in New York City, and has academic affiliations with two large, urban, academic emergency departments (EDs) that each treat over seventy thousand patients per year.

Methods: We enrolled 20 emergency medicine (EM) first-year residents into two research arms. Group A consisted of 10 first year residents who utilized a novel MR education module via Microsoft HoloLens 2. Group B consisted of 10 first year residents with an iPad. A pre-completion survey was utilized to establish a baseline. Group A had a HoloLens 2 onboarding to establish a baseline with the technology. The training consisted of videos from the Protected Airway Collaborative (PAC) and was followed by intubation simulation on mannequins. Both groups had remote Senior EM Residents (PGY3) coaches who provided real-time feedback and direction to the participants. Groups were subsequently assessed by Attending Emergency Physicians on a 10-point scale and a post completion survey was conducted after grading.

Results: There was no difference in scores between the HoloLens 2 users and iPad users (HoloLens 2 score [8.6] v. iPad score [8.5]; p = 0.56). The difference in completion time between the two groups (HoloLens 2 = 3.4 +/- 0.9 min v. iPad = 3.3 +/- 1.4 min; p = 0.45). Group A users were asked about their experience with HoloLens. The experience was mostly positive, with most users ranking their experience between the scores of 5 or 4 on a 5 point scale.

Conclusion: We concluded that didactics with the HoloLens 2 was noninferior when compared to the iPad users.

No, authors do not have interests to disclose

EMF 363 Effect of Operator Experience on Outcomes of Emergency Airway Management: The Emergency Department and Intensive Care Unit Intubation Learning Curve

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Study Objectives: Complications are common during emergency tracheal intubations. Although graduate medical education in emergency medicine, anesthesia, and critical care all mandate competency in this procedure, definitions for trainee proficiency are variable. We evaluated the relationship between experience and important complications of emergency tracheal intubation to inform definitions of trainee proficiency.

Methods: This is a secondary analysis of data from eight prior multicenter randomized trials of critically ill adults undergoing tracheal intubation in an emergency department (ED) or Intensive Care Unit (ICU). We examined the relationship between experience and clinical outcomes including first-pass success rate, lowest level of oxygen saturation, and a composite of intubation complications (oxygen saturation $\leq$ 80%, systolic blood pressure < 90, new vasopressor use, cardiac arrest, or death). For each outcome, a generalized mixed-effects logistic model was fit with the outcome of interest as the dependent variables. For each model, the partial effect of experience was plotted to create "learning curves" that visually demonstrated the relationship between experience and the outcome after adjusting for potential confounders. Results are reported as median [inter-quartile range (IQR)] and number (percent).

Results: 2,852 adults were intubated by clinicians with a median of 56.0 [32, 100] previous intubations. Clinicians included various specialties including 742 (26.0%) emergency medicine and 1869 (65.6%) critical care medicine trainees. Greater experience was associated with increased likelihood of successful intubation on the first attempt (odds ratio (OR) 1.45, 95% CI 1.21 to 1.72) and higher oxygen saturations (OR 1.07, 95% CI 1.02, 1.13). The rate of complications did not vary significantly with experience (OR 0.87, 95% CI 0.71 to 1.06).

Conclusion: For tracheal intubations performed in both an ED and ICU setting, greater experience was associated with increased first-pass success rate and decreased hypoxemia. While outcomes improve with increasing experience, our analysis did not identify a clear threshold that could be used to establish competence for trainees.

No, authors do not have interests to disclose

364 A Novel, Human Cadaveric Airway Model for Testing of Medical Devices and Interventions: The "Breathing" Cadaver Model

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Background: Preclinical testing is an essential step in the lifecycle of a medical device serving to validate utility, design features, human-factors design, device-tissue interactions, and risk reduction. Testing of human upper airway devices requires models that can approximate the complex behavior of the human upper airway. Manikin models are rigid and anatomically aberrant while animal models lack structural similarity. Computational models of the upper airway provide only theoretical insights. Alternatively, human cadavers offer an excellent option for high-fidelity testing, particularly never-frozen, never-embalmed specimens which retain many live tissue properties. We developed a novel "breathing cadaver" model for the qualitative and quantitative testing of upper airway devices and procedures.

Methods: The cadaver simulates ventilation of an unconscious patient by externally expanding one side of a dual test lung (substituting the cadaver's lungs). The test lung

is mechanically linked to an adjacent test lung driven by a mechanical ventilator. Continuous positive airway pressure (CPAP) by mask is used to establish airway patency. A bi-directional flow sensor is located in the breathing circuit. Pressure is measured in the distal breathing circuit (mask pressure) and in the driven lung. Sensor information is processed and displayed using a physiologic data analysis software program. Relevant testing parameters include inspiratory flow, mask pressure, and test lung (intrathoracic) pressure. We used the critical airway closing pressure (threshold pressure) to hold open the upper airway soft tissues, PCRIT as an objective measure of upper airway patency. PCRIT is determined by incrementally decreasing CPAP (mask pressure) until inspiratory airflow stops and the airway is collapsed. A higher PCRIT corresponds to greater airway collapsibility and has been described as the gold standard measure for the degree of collapsibility of the pharyngeal airway. At PCRIT, negative intrathoracic pressure is maximal. During mask ventilation the ventilator is connected to the breathing circuit and is placed in a volume-controlled ventilation mode. Relevant testing parameters include inspiratory flow, mask pressure, and test lung (intrathoracic) pressure. Flow is measured downstream from the upper airway utilizing a pneumotachograph. Relevant testing parameters include relative tidal volume delivered and mask pressure. More effective mask ventilation results in greater tidal volume delivered and lower mask pressure.

Results: With our simulated breathing setup, we were able establish a baseline PCRIT for individual cadavers. We then successfully compared the efficacy of standard and novel nasopharyngeal and oropharyngeal airways on upper airway patency within numerous specimens. We found that we could manipulate PCRIT by altering head positioning, necessitating very stable positioning during device testing. The model was also effective in evaluating device effectiveness during positive pressure ventilation.

Conclusion: Our novel model simulates upper airway function to test medical devices intended to relieve airway obstruction such as nasopharyngeal and oropharyngeal airways, positioning maneuvers, and, potentially, devices to relive Obstructive Sleep Apnea (OSA) symptoms. The experimental setup provides pressure, flow, and volume data, thereby enabling objective measures of comparison. Other potential uses for our model includes the evaluation of surgical interventions aimed and sleep-disordered breathing.

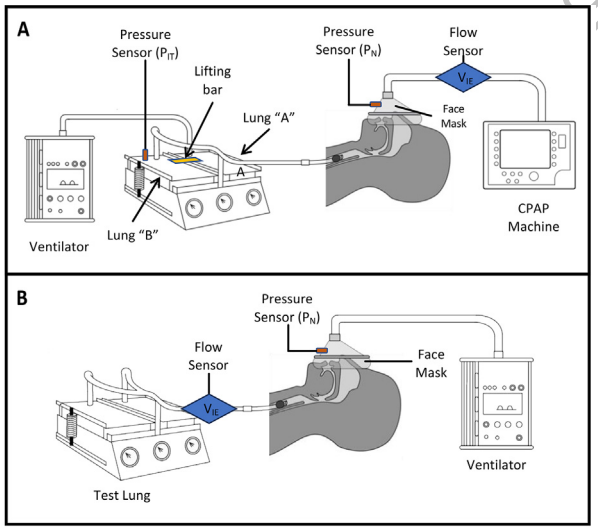

Figure1. Panel A: Schematic diagram of Cadaveric simulated breathing model. **Panel B:** Cadaveric positive pressure ventilation (PPV) model. P_N = Mask Pressure; PCRIT = Critical Airway Closing Pressure; VIE = Inspiratory and Expiratory airflow; CPAP = Continuous Positive Airway Pressure.

Yes, authors have interests to disclose
Disclosure: Olifant Medical, Inc
Other
Olifant Medical, Inc
Disclosure: Olifant Medical, Inc.
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Disclosure: Olifant Medical, Inc.
Other
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365 A Comprehensive, Checklist-Driven, Laryngoscopic Airway Intubation Method for the Emergency Department (ACCLAIMED) Initiative

Nitz M, Frank K, Landers J, Naing Z, Fitz N, Button D, McGuinness J, Coppola M, Rolston D, Jafari D/North Shore University Hospital, Northwell Health Inc., Manhasset, New York, US

Study Objectives: Historically, the clarification and analysis of factors affecting emergent intubations has been heavily reliant on participant recall and therefore at high risk for potential biases. Expanding access to audio/video review of critical resuscitations and procedures in the emergency department allows for a unique, granular approach to addressing this problem. Here, we establish a video review and video laryngoscopy (VL) data registry for emergent endotracheal intubations at our emergency department.

Methods: A consensus panel of Emergency Medicine and Critical Care physicians with experience in establishing a similar registry for cardiac arrest and trauma resuscitations convened to identify variables to be extracted from resuscitation room and VL recordings. These were selected based on a review of existing literature and databases, including the National Emergency Airway Registry. After initial selection, variables were challenged against review of actual recordings to ensure fidelity. Concurrently, the panel assisted in the development and approval of ACCLAIMED, an emergency department intubation checklist and standardized peri-intubation policy that prompts recording of these procedures.

Results: The panel met 5 times to iteratively select and define the variables of interest. In total, 68 variables have been defined for collection from these recordings. These include 8 variables that are specific to VL. These variables are defined in the attached Figure 1, which also provides a sample of the data collection sheet. Vital signs will be assessed at least 5 minutes pre-intubation, throughout each intubation attempt, and 15 minutes post-intubation. Checklist utilization and quality of communication will be assessed as well. Other data to be collected through the Electronic Medical Record and/or video recording include demographic data, outcomes, and medication interventions.

Conclusion: Audio/visual recordings for emergent intubations allow for more comprehensive analysis of variables that affect those procedures. We intend to use this data registry to identify factors that may influence peri-intubation outcomes. This includes novel utilization of VL findings that may contribute to success or difficulty with endotracheal intubation.

ACCLAIMED Video Review Data Collection Sheet

VIDEO LARYNGOSCOPY REVIEW		
VARIABLE	**DEFINITION**	**DATA RECORDED**
Time Blade Inserted	Time blade passes lips	(__:__:__) hh : mm : ss
Time Endotracheal Tube (ETT) Visualized	Time ETT visualized on VL recording	(__:__:__) hh : mm : ss
Time of Best View	Time of best view visualized on VL recording (document best POGO & Modified CL Score Below)	(__:__:__) hh : mm : ss
Percentage of Glottic Opening (POGO)	Video review-identified **BEST** POGO (rounded to closest 25%) **(Circle ONE)**	0% 25% 50% 75% 100%
Modified Cormack-Lehane (CL) Score	Video review-identified **BEST** modified CL score (refer to attached figure) **(Circle ONE)**	1 2a 2b 3 4
Visual Obstructions	Airway contents obstructing view on video **(Check all that apply)**	○ NONE ○ BLOOD ○ SECRETIONS ○ FOREIGN BODY OTHER:
Airway Clearance	Airway cleared prior to continued attempt(s)?	○ YES ○ NO
Improved Visualization	Did view improve after above clearance?	○ YES ○ NO
INTUBATION ATTEMPT-SPECIFIC DATA		
VARIABLE	**DEFINITION**	**DATA RECORDED**
Intubator:	Title of provider performing intubation (e.g. Resident incl. PGY level, Physician Assistant, Emergency Physician [Attending], Consultant)	
Blade Type	Blade type utilized for the attempt	○ DL ○ Hyper-Angulated VL ○ Geometric VL
Stylet Utilized	What stylet was utilized for the attempt?	○ Flexible Stylet ○ Rigid/Metal Stylet ○ Bougie ○ Other:
ETT Size	Internal diameter of ETT utilized (in mm)	_____ mm
Screen Position	If VL utilized, was screen at or below patient's shoulder?	○ YES ○ NO
Intubator Position	Was intubator at head of bed with bed elevated at least to their umbilicus?	○ YES ○ NO
Intubator Posture	Was intubator postured upright with elbow at or greater than 90°?	○ YES ○ NO
Patient position	Patient's position at the time of the attempt	○ SUPINE ○ RAMPED (< 30°) ○ UPRIGHT (> 30°)
Airway Manipulations	What, if any, airway manipulations were attempted? **(Check all that apply)**	○ Neck Extension ○ Posterior Shoulder Prop ○ Ear to Sternal Notch ○ External Laryngeal Manipulation ○ Other:
Result of Attempt	What was the result of this attempt?	○ Successful ○ Esophageal Intubation ○ Other:

ABBREVIATIONS: RSI – Rapid Sequence Intubation, HR – Heart Rate (in beats/minute), RR – Respiratory Rate (in breaths/minute), BP – Blood Pressure (reported as systolic mmHg / diastolic mmHg), SpO2 – pulse oximetry percent (%), EtCO2 – end tidal CO2 mmHg, NRB – Non-Rebreather Mask, BVM – Bag Valve Mask, DL – Direct Laryngoscope (Macintosh/Miller), VL – Video Laryngoscope, CXR – Chest X-Ray, POGO – Percent of Glottic Opening, CL – Cormack-Lehane

Yes, authors have interests to disclose
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366 Critical Airway Closing Pressures in the Sniffing Versus the Neutral Head Position in a Novel, Human Cadaveric Airway Model

Laney J, Provencio J, Venticinque S, De Lorenzo R/University of Texas Health San Antonio, San Antonio, Texas, US

Background: The so-called sniffing position is currently recognized as a method to align the airway axis to enhance the view of the glottic opening during direct laryngoscopy-guided endotracheal intubation (ETI). However, the maneuver was originally described 130 years ago for maintaining airway patency during deep anesthesia for patients who were breathing spontaneously without the aid of airway devices. The advent of video laryngoscopy has deemphasized the sniffing position despite its authentic role and potential as an upper airway patency maneuver during mask ventilation and ETI sequence or sedation. Limited data exists regarding airway patency in different head positions. Prior research was conducted in controlled environments, in healthy subjects, or in models with limited clinical relevance. We sought to confirm if the sniffing position confers an airway patency benefit compared to the neutral position by assessing comparative critical airway closing pressures (PCRIT) in a novel breathing cadaver model.

Methods: We previously developed a breathing cadaver model to evaluate upper airway patency devices. In our model, the unembalmed and never-frozen cadaver is made to ventilate through the upper airway and into and out of a test lung that is mechanically linked to adjacent test lung driven by a mechanical ventilator. The cadaver lungs are bypassed in this model. Continuous positive airway pressure (CPAP) by mask is used to establish and maintain airway patency. We used PCRIT as an objective measure of upper airway patency. PCRIT is determined by incrementally decreasing CPAP (mask pressure) until inspiratory airflow stops (the upper airway soft tissues completely collapse). A higher PCRIT corresponds to greater airway collapsibility and has been described as the gold standard measure for the degree of collapsibility of the pharyngeal airway. We measured PCRIT in cadavers in a neutral and a sniffing position. The sniffing position was obtained by elevating the back at the shoulder blades by 1 $^{1}/_{2}$ inches and the occiput by 3 inches. PCRIT measurements were taken in each position. We performed repeated measure in two separate adult cadavers.

Results: Cadaver #1, the average PCRIT in the neutral position was 13.7 cm H2O, while in the sniffing position, the average PCRIT was 5.7 cm H2O. PCRIT values for Cadaver #2 were 8.0 and 6.3 cm H2O for the neutral and sniffing positions, respectively. The mean PCRIT in the neutral position was 10.8 cm H20 and 6.0 cm H20 for the sniffing position.

Conclusion: This study provides preliminary evidence that the sniffing position reduces the propensity of the atonic human upper airway to collapse during spontaneous breathing. Sniffing position exhibited a lower PCRIT value compared to a neutral position by approximately 5 cm H2O. Our model provides a high-fidelity platform for evaluating upper airway collapse. Replication on a larger number of morphologically diverse cadavers as well as validation in the clinical setting is needed to confirm our data.

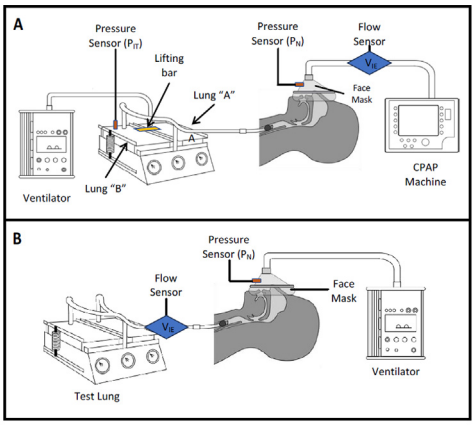

Figure 1. Cadaveric breathing model for determining P CRIT. A mechanical ventilator drives lung "A" of a test lung. Lung "A" lifts lung "B" which creates negative pressure thus causing the cadaver to inhale. A CPAP mask and machine establishes a PN that results in an unobstructed airway. PN is serially decreased until the point where VIE = O. The PN at that instant = PCRIT; PN = Mask Pressure; PCRIT = Critical Airway Closing Pressure; VIE = Inspiratory and expiratory airflow; CPAP = Continuous Positive Airway Pressure.

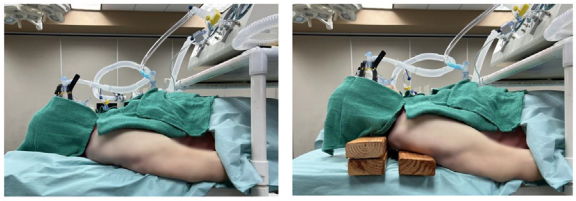

Figure 2. **Panel A**: Cadaver in the neutral position. **Panel B**: Cadaver in the sniffing position

Yes, authors have interests to disclose
Disclosure: Olifant Medical, Inc.
Other
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Other
Olifant Medical, Inc.
Disclosure: Olifant Medical, Inc.
Other
Olifant Medical, Inc.

367 Mobile Phone Auscultation to Diagnose Chronic Obstructive Pulmonary Disease Using Pulmonary Fluid Dynamics

Daniel L, Thomas A, Huecker M, Huecker B, Gosser C/University of Louisville, Louisville, Kentucky, US

Study Objectives: The food and drug administration considers mobile phones stethoscopes according to Section 510(k). Prior work has used unmodified mobile phone auscultation (MPA) to match ejection fraction, stroke volume, and COVID infection status. This study uses MPA recordings to create quantified markers that describe pulmonary dynamics. It compares the accuracy of auscultatory mapping of pulmonary fluid dynamics to formal pulmonary function testing (PFT), intending to separate patients with COPD from those without the disease. The ultimate aim is to develop a tool for EMS, emergency department (ED) and limited resource settings to detect patients with (often undiagnosed) COPD.

Methods: This IRB approved, prospective cohort study enrolled ambulatory patients presenting to the ED or pulmonology clinic, with known or suspected chronic respiratory conditions (eg, COPD, asthma, etc) and formal PFT data. After obtaining consent, enrollers obtained unmodified phone recordings of approximately 10 seconds each (five recordings per patient). Recordings included bilateral normal and bilateral deep breathing (at the anterior clavicular line, fifth intercostal space), along with unilateral right sided supraclavicular egophonic. Patients answered survey questions from the validated COPD Assessment Test (CAT). Coders then entered demographics, clinical data and PFT results into an online, encrypted database. The sponsor analyzed

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

recordings using Time Series Dynamics (TSD), a proprietary software that characterizes bio fluid dynamics, true physical sounds, without using machine learning.

Results: This initial analysis used 240 total recordings from 48 subjects. No recordings were excluded for any reason. The overall population averaged 57 years old and had mean BMI of 31.8. Most (73%) smoked tobacco; most were female (62%) and white (56%). Fifteen had confirmed COPD based on PFTs, while 33 ruled out for the disease. Based on the recordings, the COPD relevant lung acoustics were hemodynamic, rather than pneumodynamic. Normal breathing recordings yielded sensitivity of 76.7%, specificity of 97%, and area under the curve of 0.868. For the same data analyzed concurrently with FEV/FVC1, the results improved to sensitivity 93.3%, specificity 98.5%, and AUC 0.959. Deep respiration recordings performed almost identically. Of note, most of our models performed similarly to the accepted standard metrics for AUC for FEV1 (Sens 47%, Spec 100%, AUC 0.73] and FEV1/FVC (Sens 80%, Spec 94%, and AUC 0.87).

Conclusion: Evidence suggests that adding MPA data to gold standard pulmonary function testing could improve detection of COPD, a condition with a significant amount of over and underdiagnosis. MPA could, after further trials and modeling, support remote COPD testing using transmitted telehealth recording data. This would bring diagnosis to underserved areas and to patients with difficulty accessing standard diagnostics.

No, authors do not have interests to disclose

368 Real World Experience Using a Rapid Test to Distinguish Bacterial From Viral Infection in the Emergency Department

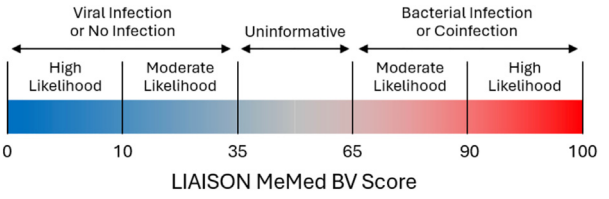
Pun C, Abu-Jubara D, Maggiore J/Loyola University Medical Center, Maywood, Illinois, US

Study Objectives: The ability to rapidly distinguish bacterial from viral infection (B-V) in patients with suspected acute infection would greatly enhance both patient care and emergency department (ED) management. Current methods for B-V discrimination are limited by the significant overlap in clinical findings and lab and imaging results in infections having bacterial and viral etiologies. The LIAISON MeMed BV test is a new, FDA-approved assay that relies on markers of the host immune response to infection for B-V discrimination. The assay measures and computationally integrates the concentrations of three serum biomarkers: TRAIL (tumor necrosis factor-related apoptosis inducing ligand), IP-10 (interferon gamma-induced protein-10) and CRP (C-reactive protein). The resulting LIAISON MeMed BV "Score" ranges from 0 to 100, where scores less than 35 indicate a high or moderate likelihood of viral infection (or no infection) and scores greater than 65 indicate bacterial infection (or coinfection) (see Figure). The purpose of this study was to evaluate the performance, operational feasibility and potential clinical impact of implementing the LIAISON MeMed BV assay into the workflow of the emergency department at Loyola University Medical Center.

Methods: The LIAISON MeMed BV assay was tested in a pilot study in late 2023. Patients presenting to the ED with suspicion of respiratory tract infection or fever without source were considered for testing. Patients were excluded if they had history of fever >7 days, immunosuppressive state, HIV, hepatitis B or C, pregnancy, trauma or significant burns, or surgery within the past 7 days. Information collected for each patient included age, sex, clinical impression, blood culture results if ordered, viral panel results if ordered, other diagnostic test results, whether the patient was prescribed an antibiotic, and clinical diagnosis after completing the workup.

Results: 22 LIAISON MeMed BV tests were run from 8/28/2023 to 11/16/23 in patients presenting with suspicion of acute infection. Scores included 9 in the range indicating a likelihood of bacterial infection (or coinfection) and 9 in the range indicating a likelihood of viral infection (or no infection). The median time to result from blood draw to reporting of results was 1h 12m (median time was 1h 4m). The LIAISON MeMed BV score largely matched the final diagnosis after completing the patient workup. In cases in which clinical diagnosis was definite (positive culture or molecular testing), the score matched the diagnosis in every case. There were four patient cases that highlighted the utility of the LIAISON MeMed BV test in providing additional information that would have obviated the need for a large molecular panel or other costly diagnostic testing, and two patient cases in children that would have allowed immediate B-V discrimination. For all cases in which the test indicated viral infection or no infection, a bacterial source was never identified. All 22 cases will be presented and the 6 cases for which the LIAISON MeMed BV test was particularly informative will be discussed in detail.

Conclusions: The LIAISON MeMed BV test provided B-V discrimination that was highly concordant with that determined using standard clinical and laboratory practice, with no instances in which a known bacterial infection was accompanied by a viral score. Importantly, there were several cases in which the assay provided key information that would have eliminated the need for additional laboratory testing and/or provided B-V discrimination at a much earlier time in the clinical workup, which would have permitted better patient care.



Yes, authors have interests to disclose
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369 Adaptivity and (In)equity in a Crisis: Health System Resource Allocation During the COVID-19 Response in African Emergency Care

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Study Objectives: The COVID-19 pandemic strained most health systems. Research has focused on wealthy countries experiencing unprecedented resource shortages. Perspectives from low resource settings are understudied and marginalized, which overlooks expertise providing care and expanding health systems despite resource constraints. We used qualitative methods to understand resource allocation during COVID-19 in Africa.

Methods: We included African emergency care professionals via stratified purposive sampling. Trained interviewers conducted semi-structured in-person and virtual recorded interviews in 2022. We reached data saturation after 14 interviews representing 7 countries in East, West, and South Africa, with prehospital, nursing, physician, administrative, and government professionals. After transcribing, 5 authors from 3 countries double-coded interviews, categorized codes, and developed themes using inductive-dominant manifest content analysis, regularly triangulating results.

Results: Meaning units (517 in total) were condensed into 109 codes. From these, five major themes were identified, detailed in the Figure, and as follows: 1) COVID was fundamentally different from prior experiences in the scale of the response, demand on the system, and initial lack of medical knowledge. 2) The nature of health system resources was context-specific, both in terms of limitations and resiliencies prior to the pandemic, and specific needs during the pandemic, including personal protective equipment, oxygen, and critical care. 3) Resource acquisition and allocation centered on the timing of the crisis response, the reallocation of resources toward COVID, and significant impacts on other aspects of the health system and public health. 4) Human capital was crucial but has complexities which differentiate it from other resources; the response required both resilience and sacrifice. 5) Concepts of planning and readiness were challenged within these low-resource settings; some perceived readiness as a luxury afforded to high-resource settings. Throughout, participants identified geographic and sociodemographic inequities in readiness, resource allocation, and response. While low resource settings fostered adaptation and flexibility, resource constraints directly increased mortality.

Conclusion: Adaptivity resulting from experience with resource constraints was an asset in the COVID-19 response. However, African emergency care professionals emphasized challenges and inequities in response timing, preventive and chronic care, and human capital. In low resource settings, healthcare readiness is context-specific and planning presents unique challenges.

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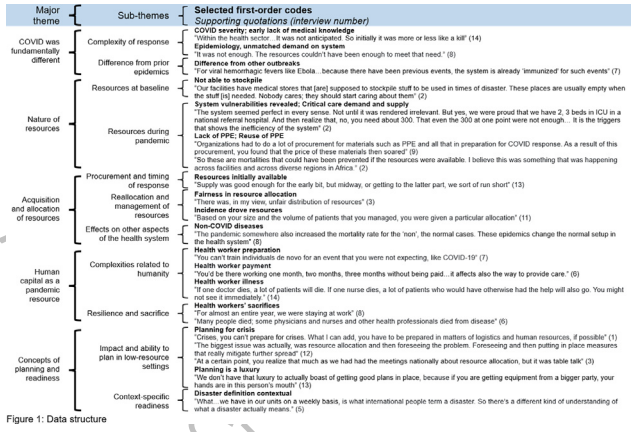

Figure 1: Data structure

No, authors do not have interests to disclose

370 Emergency Care Capacity Assessment of District Hospitals in Rwanda Using the WHO's Hospital Emergency Assessment Tool

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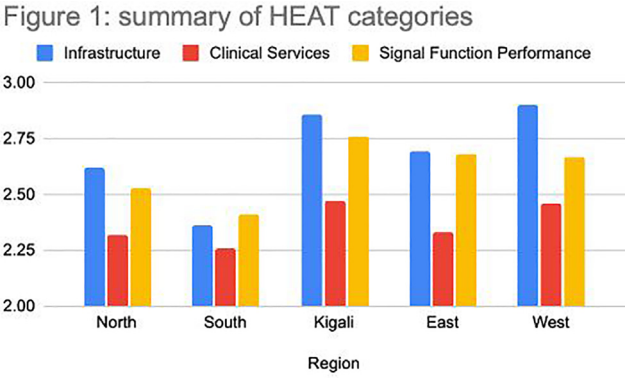
Background/Study Objectives: Access to high-quality emergency care is a pressing issue in lower and middle-income countries and is especially pertinent in Rwanda, which has one of the highest injury incidence rates of any nation globally. Emergency care capacity and disaster preparedness became increasingly relevant in early 2023 when the West and North regions of Rwanda were affected by landslides that killed over 100 people and injured many more. Furthermore, recent outbreaks of COVID-19 and Ebola in the Democratic Republic of the Congo put Rwanda at risk for similar outbreaks and would necessitate a strong emergency response. Given this, it is imperative to assess Rwanda's current emergency care capacity and disaster preparedness in order to identify weak points and strengthen future responses. As such, the objective of this study was to use the World Health Organization (WHO) Hospital Emergency Assessment Tool (HEAT) to assess emergency care capacity and disaster preparedness at district and referral hospitals in Rwanda.

Methods: This study was primarily conducted using the WHO's Hospital Emergency Assessment Tool (HEAT). The tool is divided into facility characteristics and three major categories: human resources, clinical services, and signal functions, with each category containing questions that collectively gather information on the emergency capacity of each facility. Responses were ranked on an availability scale, from 1 - generally unavailable, 2 - some availability, and 3 – adequate availability, and averaged across categories. Selected questions from the WHO's hospital emergency response checklist regarding triage protocols and human resources supplemented this assessment in order to gather more extensive information on disaster preparedness and response. In total, eight district hospitals and two referral hospitals were evaluated, all of which were selected in collaboration with emergency physicians practicing in Rwanda. The hospitals were geographically diverse, with two located in Kigali as well as two in each the North, South, West and East regions.

Results: While all surveyed hospitals had a functioning emergency department and a core of non-rotating providers, they varied in their emergency care capacity as indicated by the categories assessed by the HEAT. In general, hospitals in the East and South regions had the lowest ratings in the three major categories, while hospitals in Kigali and the West region had the highest ratings. Furthermore, the survey revealed areas for development that existed in almost all facilities. In terms of infrastructure, hospitals across all regions generally lacked a designated resuscitation area and a system for storing and dispensing controlled substances within the emergency unit. In the clinical services category, nearly all facilities lacked a CT scanner, ultrasound within the emergency department, and the ability to test for cardiac markers or perform blood cultures. The most common barriers for these and other diagnostic services was a lack of equipment. Furthermore, all facilities had a low capacity to perform technical procedures such as inserting chest tubes and establishing intraosseous access due to a lack of trained personnel.

Conclusion: This study reveals that while regional disparities in emergency care capacity clearly exist among district hospitals in Rwanda, there are also widespread deficiencies in emergency care services. We hope to use these findings to guide initiatives aimed at mitigating these disparities and further enhance emergency care capacity and disaster preparedness nationwide.



No, authors do not have interests to disclose

371 Gender Representation Among Faculty Speakers at National Emergency Medicine Conferences

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Background: Women make up only 39% of the academic emergency medicine (EM) workforce with a skew towards lower academic rank. National reputation is one criterion used for promotion at many academic institutions, and a lack of opportunities to establish a national reputation through conference speakerships may contribute to inquities in academic promotion. Past literature demonstrates an excess of male speakers at major EM conferences beyond the gender balance of our specialty. We sought to determine if our specialty has made progress in selecting women as speakers at national conferences.

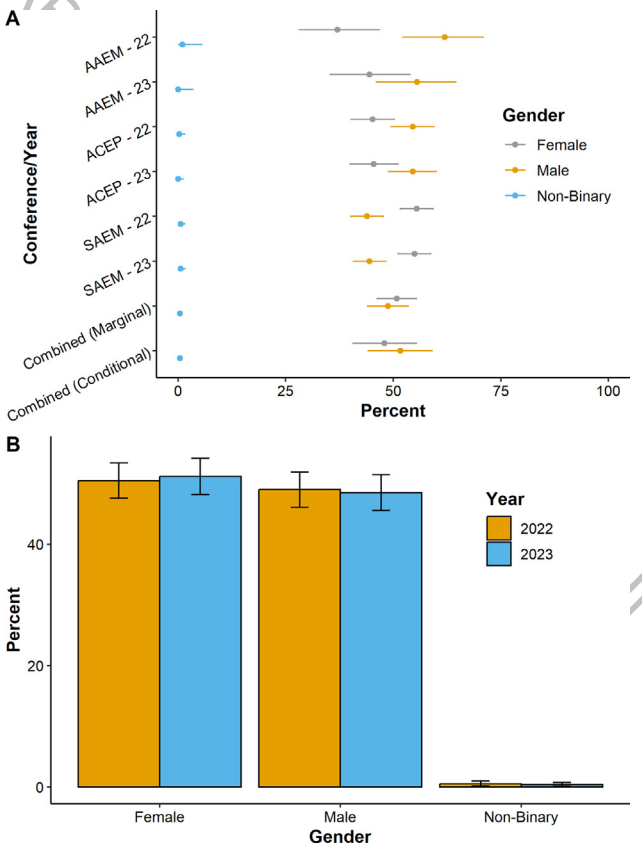
Study Objectives: 1) Describe the gender distribution of speakers at national EM conferences over 2022-2023. 2) Determine differences in gender representation of speakers at three major national EM conferences in 2022 and 2023: AAEM, ACEP, SAEM. 3) Identify trends in gender representation across 2022 to 2023 at three major national EM conferences: AAEM, ACEP, SAEM.

Methods: Publicly available speaker data for ACEP, SAEM, and AAEM annual conferences from 2022 and 2023 were reviewed. Plenary and keynote sessions, panels, and CME-eligible didactics were included in our analysis; industry-sponsored didactics, research forums and abstract presentations, pre-conference workshops, procedural clinics, committee and interest group meetings, speaker competitions, Breve sessions, and non-CME courses were excluded. Speaker gender was determined in a hierarchical fashion by using self-identified pronouns on conference websites when available, followed by personal knowledge by one of the authors, and finally genderize.io if the first two methods were not available. Due to potential clustering within conference, year, and person, percentages and 95% confidence intervals were estimated using marginal/population average models (generalized estimating equations) and conditional models (mixed-effects regressions).

Results: A total of 2,216 speakers were identified. Of those, 1,126 were identified as female, 1,080 were identified as male, and 10 were identified as non-binary. Both the marginal model (Female: 50.8%, 95% CI: 46.3 - 55.4, Male: 48.7%, 95% CI: 44.0 - 53.5, Non-Binary: 0.5%, 95% CI: 0.3 - 0.7) and conditional model (Female: 48%, 95% CI:40.6 - 55.4; Male: 51.5%, 95% CI: 44.2 - 59; Non-Binary: 0.4%, 95% CI: 0.3 - 0.5) indicated approximately equal rates of male and female speakers. Variation between conferences/years was not significant ($p = .22$). Two organizations saw an increase in female representation from 2022-2023 (AAEM: 37% to 44.4%, ACEP 45.2 to 45.5%), while SAEM saw a small drop in female representation (55.5% to 55.9%). There were 71 speakers identified as either keynote or plenary. Both the marginal model (OR = 0.74, 95% CI: 0.43 - 1.26) and conditional model (OR = 1.03, 95% CI: 0.62 - 1.71) indicated no difference with respect to the gender of keynote/plenary speakers. The

variation in the relationship between gender and keynote status between conferences/years was not significant (p = 0.85).

Conclusions: 1) All three conferences had female speakers represented at greater than their representation within academic EM and EM as a specialty. 2) All three conferences had stable or increased female representation from 2022 to 2023. 3) The identification of Non-Binary speakers was limited to self-identified pronouns on conference websites, and the sample size was too small to detect differences. 4) EM as a specialty is doing well with regard to female speaker representation at national conferences and organizations should continue to consider diversity when selecting speakers.



No, authors do not have interests to disclose

372 The Leaky Gender Pipeline in Emergency Medicine Residency Programs From 2011 to 2022

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Background/Study Objectives: While the US female population consistently fluctuates slightly above 50% according to the CDC and the National Center for Health Statistics, the emergency department visit rate for females was significantly higher, at 44 visits per 100 persons compared to the rate for males, which was 37 visits per 100 persons. Despite this overrepresentation of female patients in the emergency room, gender bias has been shown to affect women's selection of career and leadership opportunities pervasively throughout the field of emergency medicine (EM). Data from the AAMC demonstrates that women represent 35.9% of EM residents, 28.3% of EM faculty, and only 11% of EM department chairs. In this study, we explore trends of gender representation among US emergency medicine residents from 2011 to 2022.

Methods: A quantitative analysis of the Accreditation Council for Graduate Medical Education (ACGME) publicly available GME Data Resource Book from 2011 to 2022 was utilized to extract demographic data, specifically gender identity, of US emergency medicine residents. A Chi-square and Fisher's exact test was performed with the observed ACGME data, and expected values were calculated using the 2010 census data for 2011 to 2019 and the 2020 US census data for 2020 onward. Microsoft Excel was used for data collection, and analysis was done using R software V 4.2.1. IRB approval was not required because this was deidentified and publicly available data.

Results: A Chi-square analysis demonstrated significant underrepresentation of Female individuals (p<.001) in US emergency medicine training programs. Furthermore, trend analysis demonstrated that although there has been an increased number of emergency medicine residents nationwide, there has been no significant change in the percentage of female residents entering the field of emergency medicine. The most recent data from 2021-2022 shows that women were 1.3 times less likely to be represented in emergency medicine than they would be in the general U.S. population, despite making up more than 50% of the undergraduate and medical school population.

Conclusion: Although there has been increased emphasis on diversifying the field of emergency medicine and increasing access to STEM fields for females across the nation, the pipeline of emergency medicine residents has not shown any significant increase in the percentage of females represented in emergency medicine residencies. The medical community must prioritize strategies for increasing the representation of female emergency medicine residents to better reflect the patient population of the US. Future steps such as ensuring early exposure to emergency room experiences, providing diverse mentorship roles in emergency medicine, and increasing access to research and educational opportunities for female medical and premedical students is key to fortifying the pipeline for these physicians, and ensuring female patients can get the care and representation they deserve.

No, authors do not have interests to disclose

373 Sex Disparities in Extracorporeal Membrane Oxygenation Clinical Trial Enrollment

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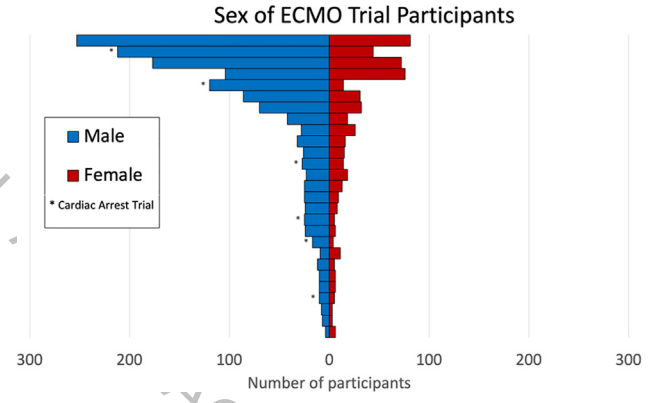
Study Objectives: Extracorporeal membrane oxygenation (ECMO) is a form of advanced life support for patients with cardiac and/or pulmonary failure. Use of both venoarterial (VA) and venovenous (VV) ECMO has increased significantly over the past two decades, including in the emergency department (ED) setting for the care of patients following out of hospital cardiac arrest. Multiple studies have shown that ECMO is utilized far more often in men than women, though the reasons for this disparity are not clear. Clinical trials allow physicians to define patient eligibility criteria and understand the likely outcomes and complications for complex, invasive therapies like ECMO. Thus, we hypothesized that sex-related imbalances in ECMO use could be a reflection of similar disparities among ECMO trials. Our objective was to determine whether sex-based enrollment imbalances exist within the recently published ECMO clinical trial literature.

Methods: A medical librarian designed the literature search using the Cochrane Highly Sensitive Search Strategy to search PubMed for ECMO clinical trials published between 2003 and 2023. The search was limited to PubMed to focus on those trials most likely to inform clinical care. Trials were eligible if ECMO was either an intervention being tested, or a mandatory inclusion criterion. The title and abstract of all search results were independently assessed for inclusion by two emergency medicine/critical care physicians with expertise in managing ECMO, with discrepancies resolved by consensus. From the included trial manuscripts we abstracted data on participant demographics, trial characteristics (location, funding), and publication information. The primary outcome was the proportion of male and female participants in each published trial. Subgroups of interest include trials published in high impact journals (impact factor 10 or greater) given the increased likelihood that these trials will impact clinical care, and trials testing ECMO for out-of-hospital cardiac arrest given the relevance of these trials to ED care. Analysis of the dataset was primarily descriptive, with median, range, and interquartile ranges provided when relevant. We provide 95% confidence intervals for the reported demographic proportions.

Results: The initial literature search identified 774 manuscripts, of which 30 were eligible for inclusion. Three trials did not provide data on the sex of participants. Twenty-five of the remaining 27 trials (93%) enrolled more men than women, and in aggregate women comprised just 28% (95% CI 26-30%) of all trial participants (547 of 1957 subjects). The Figure shows sex data for each included trial. Twelve trials were published in journals with an impact factor of at least 10; among manuscripts published in these high-impact journals 75% (95% CI 72%-76%) of participants were men. Six trials tested ECMO use in patients following prehospital cardiac arrest, and all included more men than women (median proportion women = 0.18, range 0.10 to 0.34).

Conclusion: This cross-sectional analysis of recently published ECMO clinical trials demonstrates a substantial sex-based disparity in ECMO trial enrollment.



No, authors do not have interests to disclose

374 WITHDRAWN

375 Striving for Equity in the Emergency Department: An Analysis of Race and Ethnicity Trends in Emergency Department Residencies From 2012-2022

Badloo B, Vazquez M, Darrell M, Etienne M/New York Medical College, Valhalla, New York, US

Background/Study Objectives: Black patients made up the highest proportion of emergency room visits, according to 2021 CDC data. Black and Hispanic/Latino individuals comprise 13.4% and 18.3% of the general U.S. population but only 8.7% and 11.3% of U.S. medical students, respectively. Physicians from demographics underrepresented in medicine (URiM) are more likely to work in underserved communities and contribute diverse perspectives from varied experiences to the medical community. In this study, we explore trends of racial and ethnic diversity among US Emergency Medicine residents, focusing on demographics defined as URiM by the Licensing Committee on Medical Education (LCME).

Methods: A quantitative analysis of the Accreditation Council for Graduate Medical Education (ACGME) publicly available GME Data Resource Book from 2011 to 2022 was utilized to extract demographic data, including race and ethnicity, of US emergency medicine residents. A Chi-square and Fisher's exact test were performed, and expected values were calculated using the 2010 census data for 2011 to 2019 and the 2020 US census data for 2020 onward. Microsoft Excel was used for data collection, and analysis was performed using R software V 4.2.1. IRB approval was not required as this data was deidentified and publicly available.

Results: Chi-square analysis demonstrated significant underrepresentation of Black and Hispanic/Latino individuals ($p<.000001$) in US emergency medicine training programs, with Black residents being 2.7 times less represented, and Hispanic/Latino residents being 2.0 times less represented than in the general US population. Furthermore, trend analysis demonstrated that although there has been an increased number of URiM emergency medicine residents nationwide, there has been no significant change in the percentage of URiM physicians entering the field of emergency medicine.

Conclusion: Although there has been increased emphasis on diversifying the field of emergency medicine and increasing access to care in underserved communities, the pipeline of emergency medicine residents has not shown any significant increase in the percentage of URiM physicians in training. The medical community must prioritize strategies for fortifying the pipeline for URiM emergency physicians to reflect the U.S.'s shifting patient population by increasing URiM youth exposure to emergency medicine via career awareness, mentorship, and access to research and education opportunities. While the multifactorial causes of demographic discrepancies of patients seen in the emergency room and the doctors evaluating them in those emergency rooms warrant further study, these trends show that there is still work to be done to ensure patients in the midst of medical emergencies can feel seen and represented by their healthcare providers.

No, authors do not have interests to disclose

376 Trauma-Informed Pelvic Examinations: Positive Impact of Educational Session on Emergency Medicine Learners

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Study Objectives: Refugee and immigrant populations are more likely to suffer from gender-based violence (GBV), and frequently utilize the emergency department (ED) as the first point of contact with the healthcare system. There is a paucity of data on trauma-informed care (TIC) education for physicians, especially for pelvic examinations in emergency medicine (EM). Provider awareness for appropriate language and physical examination maneuvers is paramount to mitigate re-traumatization and provide sensitive care. During a training workshop, we aimed to teach EM residents the 5 principles of TIC (safety, trust and transparency, peer support, collaboration and mutuality, empowerment of voice and choice and cultural, historical and gender issues) while performing pelvic examinations in the ED.

Methods: At our urban EM training site, a TIC workshop was held by Refugee Women's Health Obstetrics and Gynecology providers for 34 learners consisting of EM residents in various levels of training and medical students. The training session began with a Microsoft Powerpoint® presentation with emphasis on the TIC principles. The presentation was followed by role-playing, where the learners were able to use the tools provided to practice appropriate language and maneuvers. Instructors demonstrated how to apply the techniques of doing pelvic exams in small groups and learners were given an opportunity to apply the skills learned through a case-based format. The effectiveness of this workshop was studied through anonymous pre- and post-self assessment collection on a paper form. Data was recorded into Microsoft Excel® and analyzed.

Results: Thirty-four pre- and post-surveys were collected from trainees in post-graduate year (PGY)-1, PGY-2, PGY-3 and fourth year medical students. Prior to the educational workshop, 73.5% of respondents indicated they were "not at all confident" or "slightly confident" in the utilization of TIC in their practice. Seventy-one percent of learners were "not at all familiar" or "slightly familiar" with TIC. In the post-session survey, the presentation was found to be "very good" by 37% of learners while 51% of them found it to be "excellent". Nighty-four percent of learners indicated they will utilize the training either "often" (43%) or "always" (51%) in clinical practice.

Conclusion: The results of the survey displayed a largely positive impact of the educational workshop and that the learners will use the skills during their clinical practice. We believe expansion of similar workshops taught by expert speakers (such as Obstetrics and Gynecology physicians that work with vulnerable populations) to EM residencies would improve patient care and mitigate re-traumatization of vulnerable groups in the ED setting. Education on TIC models and principles is vital for emergency physicians so that we may provide sensitive and healing care to all patients, especially to those who have experienced trauma.

No, authors do not have interests to disclose

377 The New York ACEP Opportunities for Women in Leadership Program: Best Practices and Key Lessons Learned

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Study Objectives: The Opportunities for Women in Leadership (OWL) Program is a one-year program offered by the New York Chapter of the American College of Emergency Physicians (NYACEP) to promote the advancement of women leaders at all career stages. The OWL Program aims to provide leadership education and training; establish local and regional mentorship networks; and create sponsorship opportunities. The goal of this study was to assess attitudes about leadership and career goals before and after participation.

Methods: The OWL program was developed using the Kern model as a framework. Educational methods included a series of six virtual bi-monthly lectures, a mastermind group, and an assigned mentor based on career trajectory. Mentors initiated contact at least quarterly and sponsored the mentee in at least one aspect of career development. Qualitative program evaluation data was gathered through semi-structured interviews conducted by a single author. Questions asked before and after participation in the OWL program mirrored each other and related to leadership abilities, methods of gaining leadership skills, future career aspirations and personal goals for participation in the program. Audio recordings of the interviews were transcribed and then analyzed using independent line-by-line inductive coding by two

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authors, one with expertise in qualitative analysis. Discrepancies were resolved through consensus.

Results: Following an application process and use of a scoring rubric, 6 members of NYACEP were selected to participate in the first year of the program from July 2019 to June 2020. Three mentees were residents, 2 mentees were junior faculty members, and 1 mentee was a senior faculty member more than five years out of training. Six mentors were recruited through the membership of NYACEP. All 6 mentees completed the pre-participation interviews in July 2019. Due to the onset of the COVID-19 pandemic in New York in the spring of 2020, the final session and most post-participation data collection was suspended at that time out of respect for the external demands placed on mentees and mentors. All six mentor-mentee pairs published a final written summary of their accomplishments, objectives met, and lessons learned in the quarterly NYACEP journal, Empire State EPIC in August 2020. In September 2022, 5 mentees completed the post-participation interviews to assess the ongoing impact of the program two years after completion. Saturation of codes was achieved within the available interviews for analysis. Emergent themes included self-efficacy, life-long learning, and the role of women in leadership (Table).

Conclusion: Despite the limitations posed by the onset of the COVID-19 pandemic, we demonstrated a feasible model for engaging women leaders of all career stages that easily translates to other ACEP state chapters. The themes identified by the qualitative analysis point to areas of high value to participants.

No, authors do not have interests to disclose

378 Voicing the Needs of Vulnerable Women Through Their Lived Experiences: An Emergency Department Qualitative Study

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Background: Emergency departments (EDs) constitute an interface for a large population of vulnerable women with psychiatric illnesses, substance use disorders (SUD), and/or a history of domestic violence, also referred to as "Hague Characteristics". Not only are these women at risk for undesired pregnancies but their children are at increased risk for abuse and neglect. To date, there are still knowledge gaps regarding this vulnerable patients' acceptance of contraception counseling and services in the ED setting. Therefore, via researching their shared experiences, we aim to demonstrate what vulnerable women desire and need to provide equity to their reproductive health.

Methods: This qualitative research interviewed adult reproductively aged women in 2022 who had at least one of the "Hague Characteristics." We included women who were at least six weeks post-partum and with a prior lifetime ED visit while struggling with SUD, psychiatric illness, and/or domestic violence. Women in the ED and in a domestic violence shelter/recovery shelter were interviewed. Subsequently, a phenomenological structured cross-sectional interview process based on the Health Belief Model Behavior Health was done, and women were asked about their ED experiences and perspectives, and their views regarding the benefits and/or harms of contraceptive counseling and initiation in the ED. They were given gift cards for their participation and each interview lasted approximately 30 minutes. Results were generated through qualitative thematic data analysis.

Results: An analysis of 12 interview transcripts highlighted multiple emerging themes that reached saturation. 100% of the subjects supported provision of optional preventive contraceptive counseling in vulnerable women and/or preventive contraceptive initiation in vulnerable women. Although victims of domestic violence seem to have processed their trauma and attributed blame to their partners instead of themselves, they still showed reduced agency. Another emerging theme affecting their agency was the lack of non-emergent care by medical providers such as addressing underlying domestic violence or offering contraception consultations which has also reduced their trust in health care. Finally, women agreed that they would have benefitted from contraceptive initiation or guidance through the ED as a way to regain their sense of agency.

Conclusion: Trauma in vulnerable women could be inevitable. ED providers need to recognize vulnerable groups and provide them with care that extends beyond visible physical trauma. Discussing contraceptive options with them allows them to regain their sense of agency and restore their trust in the health care system.

No, authors do not have interests to disclose

379 Sex Differences in Testing for Pulmonary Embolism in Emergency Department Patients by Chief Complaint

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Background: For reasons that are complex and not well understood, women undergo diagnostic testing for pulmonary embolism (PE) in greater numbers than men, despite the disease incidence being higher in men overall. It is unknown if testing for PE varies based on patient chief complaint in addition to sex.

Objective: To determine if PE testing patterns in adult emergency department (ED) patients vary by sex and chief complaint.

Methods: This retrospective cohort study was conducted at two tertiary care hospitals. Non-pregnant adult patients (aged 18-49) were included if they presented to the ED between 1/1/2016 and 12/31/2018 with non-traumatic mechanisms and any of the following chief complaints: chest pain, shortness of breath, hemoptysis, or syncope AND had objective testing for PE. Data were obtained from the electronic medical record and analyzed descriptively; hypothesis testing includes Chi-square test of proportions.

Results: We studied 1,991 unique patients encounters, most of whom (63%; 1,256/1,991) were female. Overall, a higher percentage of women had D-dimer testing than men (76.1%; 956/1,256 vs 71.2%; 523/735; $p<0.05$), while a lower percentage of women than men (38.2%; 480/1,256 vs 42.6%; 313/735; $p=0.055$) had imaging performed. However, this trend varied by chief complaint. Among patients with hemoptysis, a higher percentage of men received D-dimer testing than women (75%; 12/16 vs 40%; 6/15; $p<0.05$) and a lower percentage of men had imaging performed than women (43.8%; 7/16 vs 66.7%; 10/15; $p=0.20$). The yield of testing for patients with hemoptysis was more than twice that of other complaints and was similar by sex. Among patients with chest pain, a significantly higher percentage of men were diagnosed with PE than women (5.4%; 22/408 vs 2.0%; 15/750; $p=0.002$).

Conclusions: Both patient sex and presenting complaint were associated with trends in diagnostic testing for PE. Specifically, this data suggests that sex differences in diagnostic testing may be most pronounced among patients presenting with chest pain.

Chief Complaint		Male (N=735)	Female (N=1256)	Total (N=1991)	p value
Chest Pain	**Patients**	408 (100.0%)	750 (100.0%)	1158 (100.0%)	< 0.001[1]
	Dimer performed	307 (75.2%)	603 (80.4%)	910 (78.6%)	0.041[2]
	Imaging performed	153 (37.5%)	253 (33.7%)	406 (35.1%)	0.199[3]
	PE diagnosis	22 (5.4%)	15 (2.0%)	37 (3.2%)	0.002[2]
Dyspnea	**Patients**	284 (100.0%)	437 (100.0%)	721 (100.0%)	< 0.001[1]
	Dimer performed	181 (63.7%)	301 (68.9%)	482 (66.9%)	0.151[2]
	Imaging performed	145 (51.1%)	206 (47.1%)	351 (48.7%)	0.304[2]
	PE diagnosis	15 (5.3%)	22 (5.0%)	37 (5.1%)	0.883[3]
Hemoptysis	**Patients**	16 (100.0%)	15 (100.0%)	31 (100.0%)	0.857[1]
	Dimer performed	12 (75.0%)	6 (40.0%)	18 (58.1%)	0.048[2]
	Imaging performed	7 (43.8%)	10 (66.7%)	17 (54.8%)	0.200[3]

Chief Complaint		Male (N=735)	Female (N=1256)	Total (N=1991)	p value
	PE diagnosis	2 (12.5%)	2 (13.3%)	4 (12.9%)	0.945[2]
Syncope	**Patients**	27 (100.0%)	54 (100.0%)	81 (100.0%)	0.003[1]
	Dimer performed	23 (85.2%)	46 (85.2%)	69 (85.2%)	1.000[2]
	Imaging performed	8 (29.6%)	11 (20.4%)	19 (23.5%)	0.354[2]
	PE diagnosis	0 (0.0%)	0 (0.0%)	0 (0.0%)	

No, authors do not have interests to disclose

380 Rate of Comorbidities and Social Determinants of Health Barriers Among Emergency Department Patients With HIV

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Study Objectives: Emergency departments (EDs) frequently identify patients who are newly diagnosed with HIV or known HIV positive but not in care. While some patients are able to be linked to care rapidly (within 7 days of diagnosis), many patients are lost to care or especially difficult to link leading to repeat ED visits and progression to AIDS and AIDS-defining illnesses. Existing ED HIV literature has suggested that other medical comorbidities (such as mental health [MH] and substance use disorder [SUD]) and social determinants of health (SDoH) barriers are contributing factors, however the true rates of these are unknown.

Methods: A retrospective chart review of prospectively collected data was performed of ED patients seen at one Midwestern urban tertiary care facility with an ED HIV screening program from 8/1/2022 to 4/1/2024. Patients were identified as newly diagnosed with HIV if there was a positive HIV 1/2 antigen antibody (Ag/Ab) immunoassay and positive HIV 1/2 Ab differentiation confirmatory test in the electronic medical record (EMR). Patients previously diagnosed with HIV were defined as any patient with a prior positive HIV Ag/Ab screen and confirmatory test or HIV RNA viral load and no documented ART medication listed in the EMR, or self-report. Charts were reviewed for co-morbidities, including MH and SUD, and SDoH factors including unstable housing, lack of reliable contact information, and previous incarceration. The primary outcome was the proportion of patients with the listed comorbidities and SDoH factors.

Results: The ED HIV program identified 38 patients with HIV, of which 11 were newly diagnosed and 27 were previously positive not in care. Of the 38 patients, 23 (60%) and 21 (55%) had a diagnosis of mental health disorder and substance use disorder, respectively. In addition, 17 (48%), 10 (26%), and 6 (16%) had unstable housing, lack of reliable contact information, or previous incarceration, respectively. Nineteen of the 38 patients (50%) had at least one SDoH factor. Rates of comorbidities and SDoH were higher for previously diagnosed patients, in comparison to newly diagnosed patients: MH (74% versus 27%), SUD (70% versus 18%), unstable housing (59% versus 10%), lack of reliable contact information (37% versus 0%), and incarceration (22% versus 0%).

Conclusion: The majority of newly and previously diagnosed ED HIV patients have co-existing mental health and substance use disorders which can complicate their linkage to HIV care. Fifty percent of patients had at least one SDoH barrier. Rates of comorbidities and SDoH are higher among previously diagnosed patients not in care, compared to newly diagnosed patients.

Yes, authors have interests to disclose

Disclosure: Gilead Sciences Inc

Investigator

Gilead Sciences Inc

381 Anticoagulant Drug Use Is Associated With Increased Short-Term Bounceback Sepsis Admission

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Background: Thrombosis under certain circumstances plays a physiological role in immune defense. Immunothrombosis is an innate immune response induced by formation of thrombi inside microvessels whereby immune cells generate an intravascular scaffold that facilitates recognition, containment and destruction of pathogens. Anticoagulant drugs antagonize coagulation and may, therefore, interfere with this defense mechanism. Our objective was to determine if anticoagulant drug use is associated with deleterious effects on patients with early infection and is associated with higher odds of emergency department (ED) bounceback sepsis admission.

Methods: We conducted a multi-center retrospective cohort analysis of adults who presented at two tertiary care EDs over a 38-month study period and were discharged home with an ICD-10-CM diagnosis of pneumonia, UTI, and/or cellulitis. Using logistic regression, we assessed if anticoagulant drug use was associated with higher odds of ED bounceback sepsis related admission within 7 days of an ED index visit after adjusting for antibiotic use, age, sex, and race. Our second outcome was to assess if anticoagulant drug use was associated with increased sepsis severity.

Results: The study cohort contained 10,179 patients. Of these, bounceback sepsis admission within 7 days occurred in 113 (1.1%) visits. Multivariable logistic regression analysis showed the odds ratio of ED bounceback admission in patients with anticoagulant drug use was 1.65 times higher (95% CI 1.00-2.71), compared to those not on anticoagulant therapy. Compared to those not on anticoagulant therapy, patients on anticoagulant therapy had 58% higher (95% CI 0.88-2.83) odds of having sepsis, and 86% higher (95% CI 0.73-4.78) odds of having severe sepsis or septic shock relative to patients who did not bounceback.

Conclusion: Patients initially discharged from the ED with pneumonia, UTI, and/or cellulitis who were taking an anticoagulant had an increased odds of bounce back sepsis admissions. Future research in larger studies should be performed to allow additional adjustment in other comorbid conditions if indicated and to assess the possible risks and benefits of temporarily discontinuing anticoagulant drugs when patients are experiencing an infection such as pneumonia, UTI, and/or cellulitis.

No, authors do not have interests to disclose

382 Testing in Urgent Care Patients With Respiratory Infections: Data From a Randomized Trial

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Study Objectives: Antibiotic overuse for acute respiratory infections (ARIs) is a consistent problem. A strong argument can also be made that there is over-testing in this same population. Over-testing can lead to overtreatment and expensive costs to patients. In patients presenting to an Urgent Care (UC) with an ARI, we tested if providing subjects antibiotic cost information affected the frequency of antibiotic use. In this same trial, we also collected data on testing. Here we provide descriptive data on this population regarding their test utilization.

Methods: This was a trial conducted at a UC associated with an academic emergency department (ED). Most patients were privately insured. A convenience sample of patients presenting with cough, sore throat, or sinus congestion were enrolled by research assistants prior to seeing their UC provider. After providing consent, they were given an informational handout describing the risks and benefits of antibiotics; the intervention group was also randomized to get cost information. The patients then were triaged and seen by a provider. Some testing was ordered at the discretion of the nurses, some tests were ordered by the provider. Descriptive data is presented. Regression analysis was used to determine if age and gender predicted testing, and to determine if testing predicted antibiotic treatment.

Results: Between September 2023 and May 2023, 239 patients were enrolled. The mean age was 39.8 years (37.4 – 42.2); 34% were male. Cough was the most common presenting complaint at 58%, while 28% had a sore-throat and 13% had sinus congestion. The three most common discharge diagnoses were upper respiratory infection (19%), pharyngitis (11%), and bronchitis (7.6%). Two patients (1%) were referred to the ED. Testing was common—78.7% of patients underwent some kind of testing. The specific test frequency was, in decreasing frequency—covid (51.9%), influenza (43.5%), chest XR (31.4%), rapid streptococcus (24.7%), RSV (5.4%), respiratory virus panel (4.6%), urinalysis (1.3%), and throat culture (0.8%). Using regression analysis, neither age nor gender predicted testing. Providers prescribed antibiotics to 35.6% of patients, with azithromycin being the most common at 42%, followed by amoxicillin-clavulanic acid (22%), and paxlovid (13%). In a regression model including age and gender, testing did not predict antibiotic prescription—OR 0.66 (0.35 – 1.24), p= 0.655.

Conclusion: In this prospectively collected data of patients presenting to an UC with ARIs, subjects undergo a variety of expensive testing. In this low acuity population, some amount of this is probably unnecessary. Testing was not predictive of antibiotic prescription.

No, authors do not have interests to disclose

383 Five-Year Differences in STI Screenings and Prevalence in a Southern Healthcare System

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Study Objectives: Sexually transmitted infections (STIs) continue to remain a public health crisis despite efforts to screen infections early. A report released by the Centers for Disease Control (CDC) in 2022 reported that continued efforts must be

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made to prevent long term sequela from infections such as chlamydia, gonorrhea, trichomoniasis, and syphilis since symptoms are not immediately apparent once inoculated. Special attention must be made in particular to syphilis as the prevalence continues to rise likely due to lack of identification through screening or initial treatment failure. The primary objective of this study was to compare syphilis screening incidence and positive screening prevalence to those of other STIs over the last five years within a Southern healthcare system.

Methods: This IRB-approved retrospective review examined healthcare records from January 1, 2019 to December 31, 2023 for six different hospitals in a large healthcare system in Upstate South Carolina. Individuals were included for analysis if they had at least one laboratory screen performed in an emergency department (ED) for an STI, including chlamydia, syphilis, gonorrhea, or trichomoniasis. HIV and hepatitis C virus were excluded due to an opt-out testing program in place within the healthcare system and herpes was excluded due to a lack of confirmatory laboratory screens. Descriptive statistics were used to describe the number of STI screens each year, the proportion of positive screens, and the five-year percent change for both.

Results: From 2019 to 2023, 37,127 individuals were screened for at least one STI in an ED. Chlamydia was the most frequent (74.4%), followed by Gonorrhea (73.4%), Trichomoniasis (48.8%), and Syphilis (26.1%). Over the five-year time span, screening for Chlamydia and Trichomoniasis trended in the upward direction at 1.9% and 61.7% respectively while screening for Gonorrhea slightly decreased at -3.0%. Screening for Syphilis increased to 40.0% but remained low when compared to the other three infections. Syphilis had the highest trend of positivity at 51.8%. The other three infections had a decreased trend in positivity, with the highest being Gonorrhea at -52.2%, followed by Trichomoniasis at -10.7%, and then Chlamydia at -3.8%.

Conclusion: Despite increased prevalence throughout the United States, Syphilis was the lowest screened STI in this large healthcare system. This is concerning as this may be adding to the spread of the disease. This study highlights that Syphilis has the highest trend of positivity while the other three diseases had a decrease in positivity when tested indicating that clinicians are missing this diagnosis. This could be due to unclear clinical manifestations of this disease that patients may be experiencing or the tedious testing processes. Although this continues to remain an obstacle in healthcare, these findings highlight a need for changes in practice when diagnosing STIs, such as lowering the threshold of testing for individuals partaking in high-risk sexual practices, testing individuals with unclear symptomatology, testing for Syphilis when testing for other STIs or developing a less tedious test for this disease process.

No, authors do not have interests to disclose

384 Predictive Factors in Emergency Department-Based HIV Testing Refusal

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Study Objectives: While the estimated number of new human immunodeficiency virus (HIV) infections has declined by 12% from 2017 to 2021, nearly 40% of new infections are spread by individuals who are unaware of their status. Routine HIV screening is still a public health priority in the United States. The Centers for Disease Control and Prevention (CDC) recommends non-targeted, opt-out HIV screening be routinely offered in all healthcare settings, with particular emphasis in the emergency department (ED) as it is frequently the primary point of care for patients. Previous literature has shown a wide variety of factors that impact routine screening rates in an ED and that ED-based HIV screening is not universally accepted by patients who present for care. However, there is a paucity of recently published literature on current patient attitudes towards HIV screening. The study objective was to determine factors that impact patient willingness to opt-in to HIV screening and barriers to screening.

Methods: We conducted a prospective survey study at Loyola University Medical Center, an urban high prevalence region. We utilized a convenience sample to approach patients between 18-64 years old who presented to the ED from May to July 2021. Consented patients were asked to fill out an anonymous 30-item questionnaire that evaluated their perspectives about routine HIV screening. Patients who initially refused HIV screening were given a brief educational intervention before being asked again. Predictive factors were identified using univariable and multivariable binary logistic regression models.

Results: Overall, 193 patients met study criteria, and 128 patients (66%) consented to and completed the survey. 39% (n=50) of those that filled out the survey consented to HIV testing, while 61% (n=78) refused HIV testing. The two most common reasons for HIV testing refusal were that the patient did not think they were at risk for HIV infection (53%) and being recently tested for HIV (32%). The most common reasons for consenting to HIV testing were being given the opportunity to be tested (84%), free HIV testing was being offered (42%), wanting assurance of HIV negative status (38%), and because it was convenient to get tested (34%). In a univariable model, the odds of refusing HIV screening were significantly lower for patients who identified as Black/African American (OR: 0.21, 95% CI: 0.08-0.55), had a history of STI (OR: 0.31, 95% CI: 0.11-0.87), and wanted to be linked to care if they tested positive for HIV (OR: 0.06, 95% CI: 0.02- 0.16). The odds of refusing HIV screening were significantly higher for patients who received an intervention after initial refusal (OR: 10.86, 95% CI: 4.44-26.58). Following multivariable adjustment, only desire to be linked to care (OR: 0.06, 95% CI: 0.02-0.22) and intervention implementation (OR: 3.69, 95% CI: 1.01-13.43) retained their effects.

Conclusion: Our results suggest that more targeted screening may have some utility in increasing opt-in screening rates. However, we recommend continuation of routine non-targeted HIV screening in the ED and incorporation of patient education on HIV risk to increase testing acceptance.

No, authors do not have interests to disclose

386 An Innovative Hearing AED Alarm System Can Decrease Automated External Defibrillator Delivery Time: A Randomized Controlled Simulation Study

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Background: Although early defibrillation with an automated external defibrillator (AED) is one of the key elements in out-of -hospital cardiac arrest (OHCA) chain, it is usually difficult to find and access a public automatic defibrillator (PAD) in emergency condition. We developed an AED-based alarmer and an Hearing AED application (APP) system that can activate registered AED within 300 meters radius of OHCA event and alert nearby responders to bring the AED to OHCA scene for emergency assistance. The aim of this study was to evaluate whether this innovative Hearing AED alarmer system can shorten the AED delivery time.

Methods: This study was a randomized controlled simulation study. Participants were randomly assigned to either bystander group, APP responder group, or AED alarmer responder group by 1:1:1 ratio. The bystander were stationed at the OHCA scene, and must access a nearby AED by the instruction of dispatcher of emergency medical services. APP responders were stationed within 300 meters of arrest scene and were activated by Hearing AED App. The AED alarmer responders were brough to AED place, and were activated by AED-based alarmer mounted on an AED case. We measured the time to find and bring the nearby AED to OHCA scene. The primary outcome was the total delivery time by each group. The secondary outcomes were time from stay place to AED place, time from AED place to OHCA scene, and operation time.

Results: Ninety participants were enrolled in this study. The total AED delivery time was significantly different between three groups and was shortest in AED alarm responder group as compared to bystander group and APP responder group. The median time for stay place to AED was statistically shorter in the bystander group than in the APP responder group (116.0 seconds, IQR 80.0-135.0 vs 159.0 seconds, IQR 98.5-200.5, p= 0.029). In general linear model analysis, there was statistically shorter total AED delivery time in the AED alarmer responder group (β=-122.4, p=0.004). In contrast, the APP responder group was associated with marked longer total AED delivery time (β=104.6, P=0.016).

Conclusion: The innovative Hearing AED alarmer system could shorten the AED delivery time by alerting community responders nearby AED in this simulation study. Further research is needed to determine its impact on early defibrillation and enhanced survival rates in real-world.

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Table 1. Demographics of participants

	Bystander group (n=30)	App responder group (n=30)	AED alarmer responder group (n=30)	p-value
Age, median(IQR)	33.5 (29.0-39.0)	34.0 (28.0-39.0)	37.0(32.0-43.0)	0.280[a]
Sex,-male, n(%)	25 (83.3)	18(60.0)	23(76.7)	0.109[b]
Place familiarity, n(%)				0.619[b]
Very familiar	13(43.3)	10(33.3)	10 (33.3)	
Familiar	16 (53.3)	18 (60.0)	20 (66.67)	
Not familiar	1 (3.3)	2 (6.7)	0 (0.00)	
First aid training, n(%)				0.270[b]
Not trained	3 (10.0)	4 (13.3)	2 (6.7)	
Trained, within date of validity	27 (90.0)	25 (83.3)	24 (80.0)	
Trained, expired validity date	0 (0.0)	1 (3.3)	4 (13.3)	

a: Mann-Whitney U test; b: Kruskal-Wallis test.

IQR: interquartile range.

Table 2. Outcomes

Outcomes	A. Bystander group (n=30)	B. App responder group (n=30)	C. AED alarmer responder group (n=30)	p-value	A vs. B p-value	B vs. C p-value	A vs. C p-value
Primary outcome							
Total AED delivery time (sec), median(IQR)	224.0 (204.0-266.0)	296.0 (203.5-423.5)	110.0 (90.0-133.0)	<0.001[b]	0.026[a]	<0.001[a]	<0.001[a]
Secondary outcomes							
Time from stay place to AED place (sec), median (IQR)	116.0 (80.0-135.0)	159.0 (98.5-200.5)	-	0.029[a]	0.029[a]	-	-
Time from AED place to OHCA scene (sec), median (IQR)	110.0 (90.0-123.0)	148.5 (102.5-213.0)	110.0 (90.0-133.0)	0.041[b]	0.013[a]	0.080[a]	0.544[a]
Operation time (sec), median (IQR)	-	48.0 (41.0-70.0)	67.5 (38.0-94.0)	0.274[a]	-	0.274[a]	-

a: Mann-Whitney U test; b: Kruskal-Wallis test.

IQR: interquartile range.

Table 3 General linear model for predicting outcomes

Outcomes	β	Std. error	95% CI	p-value
Total AED delivery time				
A. Bystander group	REF			
B. App responder group	104.6	42.61	(19.84 – 189.3)	0.016
C. AED alarmer responder group	-122.4	41.88	(-205.7 – -39.12)	0.004
Time for Stay place to AED place				
A.Bystander group	REF			
B.App responder group	55.81	39.57	(-23.50 – 135.11)	0.164
Time for AED place to OHCA place				
A.Bystander group	REF			
B.App responder group	48.76	22.85	(3.32 – 94.20)	0.035
C.AED alarmer responder group	26.19	22.46	(-18.48 – 70.85)	0.246
Operation time				
B.App responder group	REF			
C.AED alarmer responder group	15.20	12.59	(-10.02 – 40.41)	0.232

Yes, authors have interests to disclose
Disclosure: Emson Social Enterprise Co., Ltd.
Board Member/Officer/Trustee Emson Social Enterprise Co., Ltd.

387 Does an Assess and Refer Protocol Initiated by EMS to Combat Emergency Department Crowding Adversely Affect Patient Care?

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Study Objectives/Background: Due to the COVID pandemic, medical care capacity in Fresno County was overwhelmed. As a response to this, the Fresno County emergency medical services (EMS) system, a system that annually transports approximately 150,000 patients, made the decision to enact Policy 571, to "Assess and Refer" a subset of patients instead of transporting all patients that called 911 and activated the EMS system to a hospital. This study aims to look at this subset of patients that were not transported to see if the no transport process was associated with adverse patient care outcomes.

Methods: This is a retrospective chart review of patients who were not transported by EMS during the Policy 571 "Assess and Refer" time period, which occurred during August 14, 2021 - October 15, 2021 and November 4 - November 22, 2021. EMS records and hospital records were looked at during this period to determine if these patients subsequently arrived at a local emergency department (ED) to receive care in the three weeks following the initial 911 call.

Results: A total of 2,589 patients were not transported, and only a small subset, 126 patients (4.9%), required admission. Out of the patients not transported, 459 (17.7%) of the patients still presented to an ED, with 126 (27.5%) of those patients requiring admission to the hospital with an observed mortality rate of 2 (0.4%). 248 (54%) of patients presented to an ED within 24 hours of EMS contact. Of the 126 patients admitted to the hospital, 104 (81.9%) were admitted to an acute care unit with 9 (7.1%) requiring intensive care unit admission. Of note, the 459 that presented to the ED after non-transportation, 114 (24.8%) presented with a GI complaint and only 55 (12%) presented with a respiratory complaint.

Conclusion: An assess and refer policy appears to help overwhelmed medical systems by decreasing EMS traffic to the ED with a low mortality rate. This policy can be considered for future overwhelmed medical systems as only a small subset subsequently re-presented to an ED and required admission.

No, authors do not have interests to disclose

EMF 388 Emergency Medical Services Risk Factors for Stroke in Type A Aortic Dissection

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Study Objectives: Type A aortic dissection is associated with high morbidity and mortality, including high rates of stroke. Operative factors, including cannulation technique and cerebral perfusion type, have been previously characterized as risk factors for stroke after type A dissection. However, no study has evaluated the role of emergency medical services (EMS) variables in risk of stroke. Therefore, the objective of this study was to characterize the 911 EMS presentation of patients with type A aortic, comparing patients with versus without stroke and identifying factors associated with stroke.

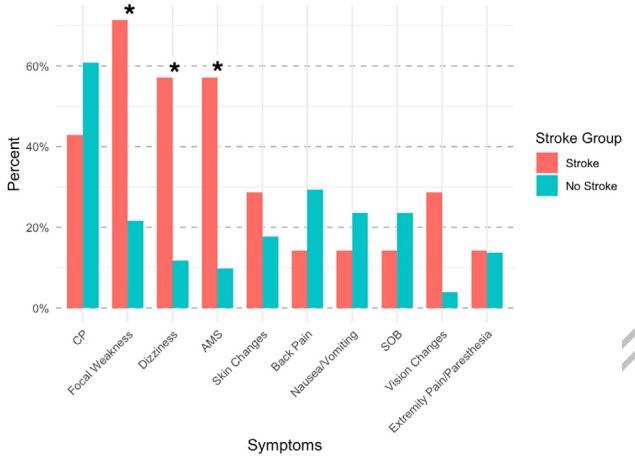
Methods: In-hospital and EMS records were reviewed for patients diagnosed with type A aortic dissection transported by 911 EMS from 2017-2022. Baseline patient characteristics, EMS characteristics, and outcomes were reported. The primary outcome was stroke within 30 days or hospital stay. A general linearized model was then used to identify the odds ratio (OR) for factors associated with stroke.

Results: There were 58 patients identified, and the incidence of stroke was 7 (12%). Baseline medical and demographic characteristics were similar for patients with and without stroke. For EMS presentation, patients with stroke trended towards having lower median systolic and diastolic blood pressure than those without stroke (112/58 vs 142/81, p=0.06 [systolic] and p=0.10 [diastolic]) and had lower median GCS (14 vs 15, p<0.001). Patients with stroke more often presented with altered mental status (4 [57%] vs 5 [10%], p=0.007), dizziness (4 [57%] vs 6 [12%], p=0.01), and focal extremity weakness (5 [71%] vs 11 [22%], p=0.02) than those without stroke (Figure 1). Finally, only patients with stroke were activated as stroke alerts by EMS (3 [43%] vs 0 [0%], p=0.02). For

outcomes, patients with stroke were more likely to have persistent neurologic deficits (6 [86%] vs 10 [20%], p=0.001). However, patients with stroke had similar 30-day mortality (2 [29%] vs 12 [24%], p>0.9) and rates of other complications to patients without stroke. Dispatch of a cardiac complaint was associated with decreased risk of stroke (OR 0.11 [95% CI 0.01-0.96], p=0.05), while altered mental status (OR 12.3 [95% CI 2.1-71.2], p=0.005), dizziness (OR 10.0 [95% CI 1.8- 56.0], p=0.009), vision changes (OR 9.8 [95% CI 1.1-85.4], p=0.04), and unilateral weakness (OR 9.1 [95% CI 1.6-53.4], p=0.02) were associated with increased risk of stroke.

Conclusion: This study is the first to assess EMS risk factors for stroke in patients with type A aortic dissection, identifying focal neurologic findings as significantly increasing risk of stroke. Prehospital stroke alert was also higher in patients with stroke, suggesting EMS providers may play a key role in identifying those at risk for this complication. The findings of this study guide providers in using EMS presentation and EMS clinician assessment to earlier identify those at increased risk for stroke.

Figure 1. Symptoms of patients with type A aortic dissection with versus without stroke presenting to 911 EMS.



CP = chest pain, AMS = altered mental status, SOB = shortness of breath. Significant differences (p<0.05) are noted with *.

No, authors do not have interests to disclose

389 Pre-Hospital Naloxone Use Patterns and Patient Outcomes: A National Observational Study

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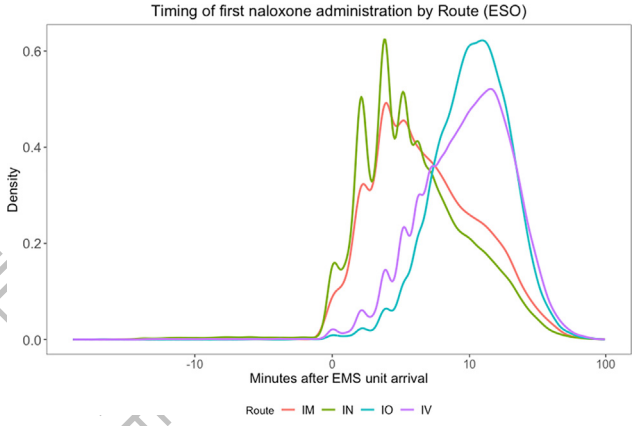
Study Objectives: The United States faces high rates of opioid overdose, with increasing potent synthetics use. While naloxone is widely administered in cases of suspected opioid overdose, out-of-hospital use is not well characterized. Our objective was to describe national naloxone use and patient outcomes among those receiving emergency medical services (EMS) care.

Methods: This was a retrospective, observational study utilizing two national EMS databases: the National EMS Information System (NEMSIS) (2017-2021) and the ESO Data Collaborative (2020-2021), the latter of which includes linked emergency department (ED) data for a subset of cases. The primary cohort was unscheduled EMS responses involving naloxone administration and originating from a non-healthcare setting. Density functions, Kruskal-Wallis (ordinal by nominal data) and Mann-Whitney-U (bivariate nominal data) testing were used to assess for significant differences at the alpha < 0.05 level.

Results: There were 996,750 and 143,783 eligible EMS responses involving naloxone identified from NEMSIS and ESO datasets. For brevity, the following results focus on the more detailed ESO data. The most common EMS primary impressions for cases involving naloxone were similar to the primary ED diagnoses for the subset of cases with linked ED data: "substance abuse/overdose" (57.5% vs 40%), "altered mental status and unconsciousness" (14.5% vs 10%) and "cardiac arrest" (10% vs 5.5%). Prehospital, initial doses of naloxone were administered via intranasal (IN), intravenous (IV), intramuscular (IM) and intraosseous (IO) routes 46.7%, 38.4%, 8.2%, and 5.5% of the time, respectively. Dose distributions were multimodal and right-skewed, but similar between years and for total, initial and subsequent doses. The most common dose was 2 mg for each route. However, IN and IV routes had more prominent secondary peaks at 4 mg and 0.4-0.5 mg, respectively. Median time to dose was quicker for IN (3 minutes) and IM (4 minutes) as compared with IV (10 minutes) and IO (11 minutes). See Figure for the unit density functions relaying the timing of first dose by route. Naloxone was given only once in ~68% of responses and in 4+ doses in fewer than 2% of cases. Frequency of repeated dosing ranged from 27%-45% depending on route, with the least repeated dosing for IO. IM route was associated with greatest rate of EMS-reported improvement (67%) compared to IV (63%), IN (59%) and IO (17%). Among all patients administered naloxone by EMS, 83% were transported by EMS, 9.9% refused transport, 1.2% were released per-protocol and 4% were pronounced dead on-scene by EMS.

Conclusions: There is variation in EMS naloxone administration patterns nationally, in both dose amount and route. Furthermore, timing of administration and response appear to differ by route. Research should leverage this variation to examine potential differences in efficacy, particularly given ongoing changes in the illicit drug supply.

Disclaimer: This publication reflects the views of the authors and should not be construed to represent FDA's views or policies.



No, authors do not have interests to disclose

390 Adaptation of the Foundations of Emergency Medicine Electrocardiogram Curriculum

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Study Objectives: The purpose of this study was to evaluate the application of the Foundations of Emergency Medicine (FoEM) Electrocardiogram (ECG) curriculum for second-year emergency medicine (EM) resident physicians. It utilized a paired in-person and asynchronous format to assess the development of overall competency in ECG interpretation. An additional aim was to evaluate the efficacy of this curriculum in improving the reliability of identification of ST-elevation myocardial infarctions (STEMIs) and STEMI equivalents.

Methods: The FoEM Curriculum consists of units covering fundamental areas in ECG interpretation with each unit containing a unit summary reviewing the foundational material, four challenge ECGs, and an interpretation guide for each challenge ECG. The adaptation of this curriculum included ten units with topics covered including STEMIs, ischemia mimics, syncope, wide complex tachyarrhythmias, fascicular blocks, non-ST elevation myocardial infarctions, other ischemic ECGs, potassium derangement, miscellaneous ECGs, and paced rhythms. Sessions were conducted both in-person and asynchronously to facilitate the residents' unique schedules. The in-person sessions contained a brief introductory lecture based on the FoEM unit summary, small-group interpretation of the challenge ECGs, and a large group discussion of the challenge ECGs. The

asynchronous component consisted of distribution of the FoEM unit summary and slide deck from the in-person lecture and a Google Form covering the challenge ECGs. Immediate feedback from the interpretation guide was provided immediately after submission of the Google Form. The asynchronous sessions were required for any resident not able to attend the in-person session on the topic. Curriculum evaluation consisted of 5-point Likert scale self-efficacy surveys, a pass-fail ECG test on the identification of STEMIs and STEMI equivalents and a feedback survey. The self-efficacy surveys and the ECG test were completed by the residents prior to and upon completion of the curriculum. The self-efficacy survey data were analyzed using paired T-tests and the ECG test results were analyzed using binomial exact tests. The curriculum evaluation survey composed of a series of feedback statements rated on a 5-point Likert scale and a free-text qualitative feedback section.

Results: The self-efficacy surveys demonstrated significant improvement in perceived self-efficacy overall ($p<0.001$) and in all individual topics ($p<0.004$) with a mean improvement of 1.18 on the 5-point Likert scale. The ECG test showed a significantly increased pass rate from 10% to 70% ($p = 0.03$). The post-curriculum feedback survey indicated residents believed the curriculum contained valuable information and was worth the time investment with scores of 4.7 and 4.9. Further, the in-person sessions were more highly rated than the asynchronous sessions with scores of 4.5 and 3.7, respectively.

Conclusion: The adapted FoEM curriculum results in improvement in perceived and objective ECG interpretation competency in second year EM residents. Additional steps may need to be taken to improve the asynchronous component to increase learner satisfaction and engagement.

No, authors do not have interests to disclose

391 Soft Embalmed Cadavers as a Novel Approach to Arthrocentesis Education

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Study Objectives: Soft-embalmed cadavers use a novel preservation technique to preserve tissue flexibility. This type of cadaver has been shown to be a superior training model for multiple surgical subspecialties. Given that emergency medicine (EM) requires knowledge and skill in an array of orthopedic procedures, the life-like tissue properties of soft-embalmed cadavers holds significant potential for use in emergency medicine musculoskeletal education. The development of procedure labs using soft-embalmed cadavers to foster strong skills in orthopedic procedures has promise in EM training and provides the opportunity to develop and maintain these skills in a safe environment. The objective of our study was to use soft-embalmed cadavers to effectively teach the relevant anatomy for knee arthrocentesis as well as the procedure itself using anatomical landmarks and ultrasound guidance.

Methods: Iatrogenic knee effusions were created by teaching faculty by injecting sterile water under ultrasound guidance into the knee joint capsule of two soft-embalmed cadavers. Trainees were taught to perform knee aspirations using both anatomical landmarks and under ultrasound guidance to simulate knee arthrocentesis. Direct, verbal real-time feedback was given to trainees during the simulation to ensure successful visualization (under ultrasound guidance) of the knee joint, effusion, needle, and aspiration. A successful arthrocentesis procedure was measured as visualization of the needle into the joint space using a suprapatellar approach and aspirating the artificially placed sterile water into the syringe. Residents also practiced the procedure using anatomic landmarks without ultrasound guidance. Surveys were administered to twelve second-year emergency medicine residents who participated in a knee arthrocentesis simulation lab before and after the simulation. Survey questions were developed to assess comfort level in identifying a knee effusion using ultrasound compared to physical exam, performing a knee arthrocentesis using ultrasound, and performing a knee arthrocentesis using anatomic landmarks using a 5-point Likert scale. Both survey instruments were reviewed by two subject matter experts in emergency medicine and sports medicine to establish evidence of validity. As needed, questions were revised and reevaluated prior to survey implementation. This study was deemed exempt by the Behavioral/Non-medical Institutional Review Board at the University of Florida.

Results: Resident participants reported increased comfort in performing knee arthrocentesis using both landmarks ($p=0.003$) and ultrasound guidance ($p<0.0001$) after instruction using the soft-embalmed cadaver knee as a model for arthrocentesis. Trainees reported they were more likely to use ultrasound to diagnose knee effusions ($p=0.003$) and to use ultrasound guidance while performing knee arthrocentesis ($p=0.001$) after successful completion of this simulation. The value of this simulation lab and satisfaction amongst trainees were unanimously reported 5 out of 5 on Likert scale by all participants.

Conclusions: The properties of soft-embalmed cadavers offer innovative procedural training opportunities for medical education and training. Our study has shown high rates of satisfaction and increased learning comfort performing this procedure by using this modality for procedural teaching specifically for knee arthrocentesis. Our study suggests this model has potential for high-value residency curriculum education and improvement in trainee comfort with performing ultrasound-guided arthrocentesis.

No, authors do not have interests to disclose

392 Enhancement of Medical Education in Point-of-Care Ultrasound Using Additive Manufacturing

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Background/Study Objectives: Additive Manufacturing, commonly known as "3D printing," is a technique that generates plastic objects from a source digital file. Although initially developed to produce rapid prototypes in manufacturing settings, 3D printing technologies are now being used ubiquitously–including medical education. Prior research has demonstrated the benefits of additive manufacturing in resident learning. However, minimal studies have explored the effects of 3D printed, cross-sectional models in point-of-care ultrasound (POCUS) education at the level of a medical student. A common challenge to learning POCUS is the ability to visualize 3-dimensional structures in a 2-dimensional plane. We aim to bridge this gap by designing high-fidelity anatomical models to supplement the ultrasound education curriculum at the David Geffen School of Medicine at UCLA. The purpose of this project is to incorporate additive manufacturing into ultrasound education by creating cross-sectional anatomical models to serve as a tactile reference source for medical trainees during ultrasound acquisition and spatial reasoning.

Methods: We uploaded de-identified MRI images into the 3D Slicer software to render the anatomical structures of interest (SOI): Uterus/Ovaries, Kidney, Liver/Gallbladder, and Heart. These renderings were then modified in the software Blender to design a digital model compatible with real-world printing. Each product was printed using a Bambu Lab X1 Combo printer. Our test subjects include first and second-year medical students enrolled at UCLA David Geffen School of Medicine. Students will complete an anonymous pre-test survey regarding their medical knowledge of the SOI as well as confidence in using POCUS and interpreting POCUS images. We will then utilize these cross-sectional 3D models to assist their learning during scheduled POCUS courses. After the course session, students will complete a post-survey measuring the same variables as above. Qualitative feedback about these models will be obtained and incorporated into future lesson planning. Pre/post-test results exploring the effects on learning are pending IRB approval.

Results: We expect that implementing 3D printed models in the students' scheduled POCUS courses will lead to significant improvement in self-reported medical knowledge of the SOI, as well as confidence in using POCUS and interpreting POCUS images as measured by the post-test survey when compared to the pre-test survey.

Conclusion: Using the above methods, we were able to successfully recreate 3D models of the SOI with multiple cross sections designed to maximize visual learning. Printing the models using a Bambu Lab X1 Combo printer was substantially less expensive than purchasing models sold by commercial retailers, further emphasizing the utility of additive manufacturing in reducing departmental costs for supplemental teaching aids. We expect to see improvement in the post-test surveys. These improvements would exemplify the potential of implementing 3D models in improving medical trainee understanding of anatomy, confidence in using POCUS, and spatial reasoning while interpreting POCUS images. Challenges included selecting imaging modality, aligning the slices, and determining magnet size. Future goals for this project include designing models that incorporate pathology.

No, authors do not have interests to disclose

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393 How Many Central Venous Lines Do Supervising Physicians Believe Resident Trainees Require to Be Competent?

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Study Objectives: Residents are trained to perform bedside procedures that are essential for independent practice. Presently, there is no consensus regarding number of central venous lines (CVLs) a trainee must place under direct supervision prior to performing the procedure under indirect supervision. There is also no consensus around how the quality of these placements should be determined or recorded. This is problematic from the standpoint of both competency-based education and patient safety. The ACGME specifies procedure minimums in some cases that must be completed by the time of graduation. As residency programs shift towards competency-based medical education, we must consider not only benchmarks for number of procedures performed, but also objective evidence that trainees are qualified to perform the procedure (practice ready) without a supervisor immediately at the bedside (indirect supervision). We aim to determine how many CVLs a supervising physician thinks a trainee needs to complete at each of the three standard sites both in terms of total number of repetitions and practice-ready repetitions in order to be considered competent for indirect supervision.

Methods: We utilized a nonprobability sampling design with purposive sampling of supervising physicians (attendings and fellows) in multiple specialties involved in supervising residents in CVL placement at Vanderbilt University Medical Center (VUMC). Electronic REDCap surveys were emailed to eligible participants via secure VUMC accounts.

Results: We had a survey response rate of 67.4% (161/239). Respondents represented departments of emergency medicine (27.3%), general surgery (12.4%), anesthesia (35.4%), and internal medicine (24.8%). 87% of responses were from attending physicians; 13% from fellow physicians. Consensus among supervising physicians was determined utilizing the mode, suggesting consensus across specialties and CVL line type. We asked about each anatomical site individually. For subclavian, femoral, and internal jugular CVL placement, the mode for number of practice ready lines required prior to indirect supervision was 5 for each type. The mode for number of total lines at each site needed for procedural competence was 10.

Conclusion: In an effort to standardize bedside procedural competency, we utilized expert consensus to quantify 1) the number of CVLs a trainee must place at practice-ready level prior to being deemed competent for indirect supervision, and 2) the number of total CVLs a trainee must place prior to being competent for independent practice. This expert consensus may be utilized to inform ACGME requirements and set institutional standards.

No, authors do not have interests to disclose

394 Research Associate Programs to Supporting Residency Scholars: How They Are Funded

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Study Objectives: Research associate programs train undergraduate university students to participate in clinical research. They represent an innovative approach to supporting residency faculty and resident physicians to successfully undertake scholarly activity. This study investigates the funding models of university—and college-based clinical research associate programs in the United States. Understanding these models is crucial for facilitating the adoption of RAPs by new institutions and ensuring their long-term viability.

Methods: The current study used the American Research Associates Program Registry (ARAPR). Established in 2014, it was initially developed through Medline searching, the authors' direct familiarity, comprehensive online search (using terms such as RAP, academic associate program, research associate program, undergraduate emergency medicine research), and chain-referral "snowball" sampling. Aiming for a minimum 75% response rate, aggressive communication, and follow-up were employed to develop and maintain the database. The current study draws upon the information provided by participating institutions, which includes a 78% response rate. Data regarding funding methods and sources was collected from all participating institutions. The continued existence of programs was verified before analysis. Descriptive statistical analysis was used to describe the basic funding characteristics of the programs and the chi-square/Fisher's exact test for dichotomous contingency comparisons.

Results: Fifty-one programs were identified in the registry, with 40 responding to its survey (78%). Funding sources varied considerably, with some programs hiring a specific manager primarily responsible for the program and a small percentage reporting that the program was not funded (6/40, 15.0%). All but two programs were funded, and only one required payment from the participants. The most frequently reported funding categories were the base hospital (14/40, 35.0%) or the base university (12/40, 30.0%). Many programs had more than one source of funding. Survey respondents indicated that 37.5% (15 programs) of the time, funding was partially or wholly derived from research grants. University hospitals were the sites of 24 programs (24/40, 60%) and 16 (40%) were in a community hospital. As expected, more university programs identified their academic institution as their primary funding source. In contrast, community hospitals generally received no university funds: only one program out of the 16 community hospitals was funded by a university ($p=0.012$). Although not statistically significant, university programs were more likely to be supported by research grants (11/24, 45.8%) than community programs (4/16, 25%; $p=0.16$).

Conclusion: In this registry analysis, we provide an overview of the funding status of research associate programs in the United States and Canada. The findings underscore the crucial role of the program's base hospital or university as the primary funding source. This information can provide a basis for planning new research associate programs or guiding their sustainability.

No, authors do not have interests to disclose

395 Social Media Trends by Program Type and Region in Emergency Medicine Residencies

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Background: The landscape of emergency medicine (EM) residencies is evolving, marked by a surge in new programs alongside a decline in applicants from U.S. medical schools. Consequently, EM programs increasingly compete for a smaller pool of EM-bound students. In this competitive environment, social media (SM) has emerged as a useful tool for program branding and recruitment strategy. However, the challenges encountered in the recruitment process are multifaceted and contingent upon factors such as geographic location and setting of training. Despite the important role of SM in recruitment, current SM trends relative to these factors remain understudied.

Study Objective: This study aims to fill this gap by quantifying and describing trends in SM activity for EM residencies based on geographic region and program type. We hypothesize that regions with a higher number of programs exhibit elevated SM activity and that academic programs demonstrate a more elevated SM presence.

Methods: Based on the Emergency Medicine Residents' Association (EMRA) Match site, we examined 287 unique EM residency programs during the study period spanning September 2022 to August 2023. We conducted an analysis of publicly available data on Twitter (X) and Instagram (IG) for each institution. We categorized programs based on the U.S. Census Data Map and program type, which encompassed academic, community, or county settings, as self-reported by programs. Metrics including content, engagement, and composite scores were computed for each program.

Results: Our findings, as illustrated in the Table, demonstrate a positive correlation between SM activity and the number of programs in a given region. Furthermore, when controlling for the number of programs, northern regions, including West and East North Central, New England, and the Pacific all exhibited a trend of having more SM activity compared to southern regions, with the exception of the Mountain region. In terms of program type, academic programs emerged as having the highest level of SM activity, followed by community programs, and then county programs. Compared to X, IG is more frequently used by programs, generates more engagement, and has higher composite scores.

Conclusion: Our study highlights several key findings regarding SM trends in EM residencies. Firstly, regions with a higher number of programs generally tend to have more SM activity. When corrected for SM activity per program, northern programs demonstrated higher content and engagement on both IG and X than southern programs. New England, when corrected for the number of programs, was noted to have the strongest SM presence, with the highest engagement across both platforms, the highest IG content, and the second highest for X content. Moreover, academic programs consistently exhibit the highest levels of SM activity, followed by community

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programs and county programs. This trend is particularly pronounced on IG, where academic programs have the most robust presence. These insights provide valuable implications for EM residency programs seeking to optimize their SM presence and recruitment efforts. Particularly for programs encountering recruitment obstacles with limited SM activity, these patterns provide a framework for strengthening their online presence.

Table 1. EM Residency Program Activity on Twitter (X) and Instagram (IG) by Geographic Region

Geographic Region	# Programs	% of Programs	X Content (posts)	X Engagement (likes, reposts, comments)	IG Content (posts)	IG Engagement (likes, comments)	X Composite (content + engagement)	IG Composite (content + engagement)
Pacific	28	9.8%	745	6707	1266	53676	7452	54942
Mountain	11	3.8%	52	720	231	14608	772	14839
West North Central	11	3.8%	363	3294	226	17041	3657	17267
East North Central	61	21.3%	1239	14684	1816	89605	15923	91421
West South Central	28	9.8%	274	2159	539	40021	2433	40560
East South Central	12	4.2%	94	975	185	15338	1069	15523
South Atlantic	54	18.8%	515	4683	1335	78464	5198	79799
Mid Atlantic	70	24.4%	1125	13220	1379	93144	14345	94523
New England	12	4.2%	328	4878	549	55517	5206	56066
Program Type	**# Programs**	**% of Programs**	**X Content (posts)**	**X Engagement (likes, reposts, comments)**	**IG Content (posts)**	**IG Engagement (likes, comments)**	**X Composite (content + engagement)**	**IG Composite (content + engagement)**
Academic	99	34.5%	2863	33845	3882	245832	36708	249714
Community	142	49.5%	1059	8151	2745	145221	9210	147966
County	35	12.2%	813	9324	855	64877	10137	65732
Not specified	11	3.8%	0	0	35	1485	0	1520

Figure 1. EM Residency Social Media Activity by Geographic Region

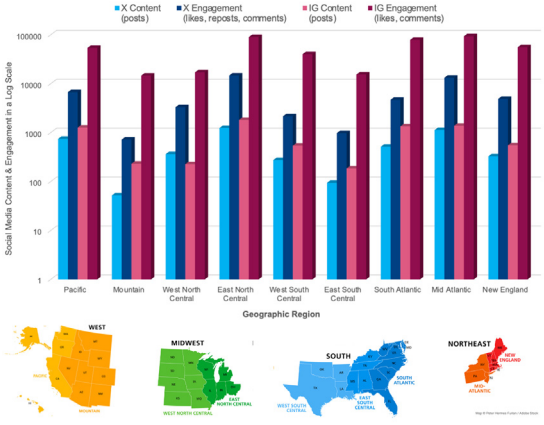


Figure 2. Distribution of EM Residency Social Media Activity by Program Type

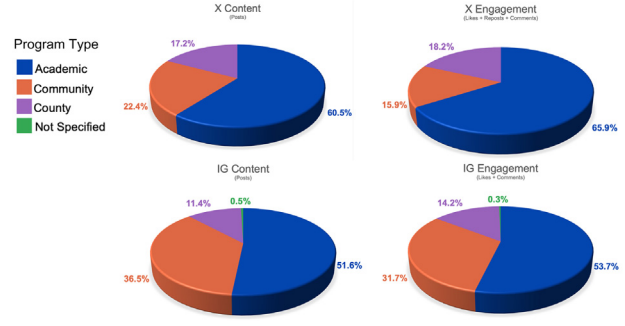
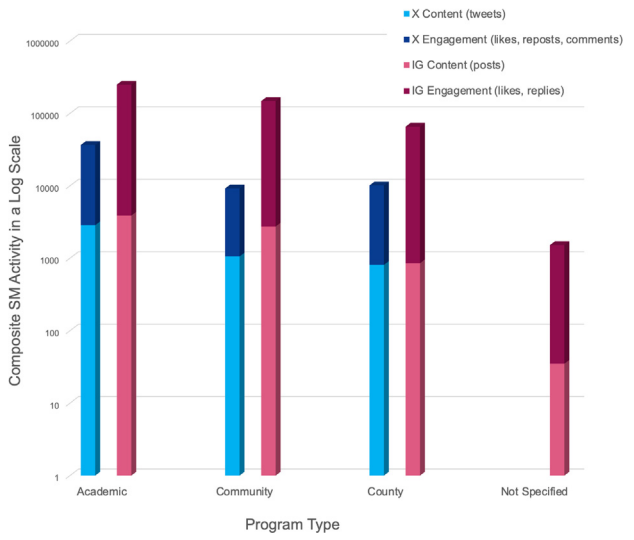


Figure 3. EM Residency Composite Social Media Activity by Program Type



No, authors do not have interests to disclose

396 Behavior Cuing in Student Assessments Improves Feedback Concordance

Tesorero R, Holman B, Hsu I, House J, Dinh D, Hopson L/University of Michigan, Ann Arbor, Michigan, US

Background: Providing feedback is challenging yet essential to learner development. Timely and actionable feedback is particularly essential on emergency medicine rotations, where students do not consistently rotate with the same supervising resident or faculty member. Throughout clinical rotations, medical students frequently report dissatisfaction with feedback due to inadequate quantity, vagueness, and discordance between verbal and written elements. Cognitive forcing strategies and checklists show potential to change behaviors.

Study Objectives: We incorporated a "stop and think" checkpoint in supervisor assessments of medical students rotating on emergency medicine. They were required to answer yes or no to the statement: "I discussed this feedback with the student." We hypothesized this would positively improve students' assessment of feedback quality and verbal-written feedback concordance.

Methods: Three feedback perception questions were added to the end-of-clerkship student evaluation including overall quality, verbal-written concordance, and a free-text descriptive option. We prospectively collected 8 months of data (n=82) prior to adding the feedback verification question to the supervisor assessment. We compared the pre-intervention data to 5 months of post-intervention data (n=49).

Results: The percentage of students rating the quality of clerkship feedback as excellent or very good increased from 62% to 74%, which was not significantly different (p=0.76). The percentage of students reporting concordance of the verbal and written feedback the majority of the time improved significantly from 72% to 87% (p<0.001). Importantly, the proportion of students reporting feedback concordance more than 75% of the time increased from 37% to 67%. No consistent themes emerged in the free-text comments. During the intervention period, there was not a significant increase in incomplete or unsubmitted assessments from supervisors.

Conclusions: A verification question added to student assessment forms can positively impact student perceptions of verbal-written feedback concordance, although not overall perceptions of feedback quality. This easy-to-implement strategy may provide one mechanism for educators to encourage supervising residents and faculty to improve their feedback concordance. Future work will examine the persistence of the effect and consequences of the intervention, including changes in the type of feedback information.

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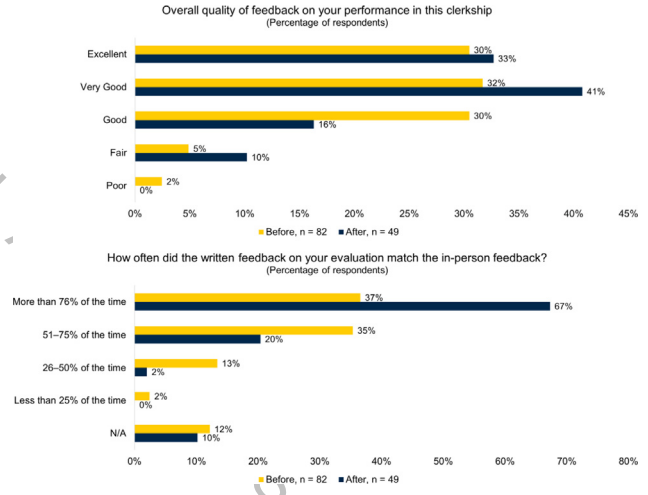

No, authors do not have interests to disclose

397 Novel Model for Forearm Nerve Blocks Incorporating 3D Printing Technology

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Study Objectives: Regional anesthesia offers an effective alternative to systemic analgesia and avoids its adverse effects. Physicians require simulation models to learn and become proficient at these procedures. Models for ultrasound guided median nerve blocks are expensive and unattainable for some learners. We set out to create a cost effective model incorporating 3D printing technology for simulating median nerve blocks that can be easily disseminated.

Methods: We used open access computer aided design (CAD) software to create a mold that produced a model of forearm anatomy. The mold was 3D printed using a fused deposition modeling (FDM) 3D printer and polylactic acid (PLA) filament. Readily available materials were selected to represent the artery and nerve. The model was then cast using ballistic gel. The total cost to produce the model was $50. Instructions can be found at https://www.thingiverse.com/thing:6377526. We evaluated our model in a single center convenience sample study of emergency medicine residents. We provided the residents with a brief introduction to forearm nerve block procedures. Participants were able to examine the Blue Phantom Regional Anesthesia Ultrasound Training Block Model. They then had the opportunity to perform the nerve block procedure on our novel model. Participants were asked to complete a voluntary survey. A five point Likert Scale was used to evaluate the Blue Phantom and novel model. User feedback on the novel model was also collected to refine the design of the model. Means, standard deviations, confidence intervals, and paired t-tests were calculated from the data.

Results: Ten PGY-1s, five PGY-2s, and four PGY-3s completed our voluntary survey. All 19 respondents stated that the novel model was adequate to simulate nerve blocks. The novel model was more consistent with forearm anatomy, more durable, and more accurately simulated the nerve block procedure when compared to the Blue Phantom model (P values of 0.028, 0.028, and 0.005 respectively). From the open ended comments of the survey, we repositioned the artery and nerve features to locate them closer to the center of the model.

Conclusion: This work demonstrates that an effective and noninferior nerve block model can be created using 3D printing technology and readily available materials. We believe this project encourages the creation of further unique simulation models to facilitate emergency physician education.

No, authors do not have interests to disclose

398 Deployment of an Automated Resident Procedure Logging System Is Not Associated With Changes in Rates of Off-site Procedure Logging

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Study Objectives: We recently deployed a novel automated system to log resident procedure completion based on electronic health record (EHR) data. One concern about using such a system is that after implementation, residents may be less likely to manually log procedures completed during off–site rotations where the automated system was not in operation. We sought to determine if there was a difference in rates of manual procedure logging before and after deployment of the automated system.

Methods: Rates of 27 procedures logged manually (per resident per month) during off–site rotations were calculated for seven months prior to the deployment of the automated system (December 1, 2022 – June 30, 2023) and seven months after deployment (July 1, 2023 – January 31, 2024). The median rates of procedure completion before and after deployment of the automated system were compared using the Wilcoxon sign–rank test, with statistical significance defined as having an exact p value < 0.05.

Results: For 26 of the 27 procedures, we were unable to find evidence of a statistically significant difference between rates of procedures manually logged before and after deployment of the automated procedure logging system (see Table for detailed results). The exception, dislocation/fracture reduction, was associated with a statistically significant and higher rate of manual logging (p=0.031) after deployment of the automated system.

Conclusion: Deployment of a novel automated resident procedure logging system at our institution was not associated with statistically significant changes in rates of manual procedure logging performed during off–site rotations. This information may be useful to residency programs wishing to utilize a similar procedure logging system,

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particularly those with concerns that use of such a system may be associated with significantly lower rates of off–site manual procedure logging.

Table. Data regarding off–site procedures manually logged before and after the deployment of an automated procedure logging (APL) system.

Procedure	Pre–APL Residents[a]	Post–APL Residents[a]	Pre–APL Mean[b]	Post–APL Mean[a]	Pre–APL Median[b]	Post–APL Median[c]	*p* (exact)[d]
Adult endotracheal intubation	26	38	4.45	4.25	5.00	3.71	0.813
Adult medical resuscitation	25	33	2.76	3.31	2.75	2.75	0.750
Adult trauma resuscitation	12	20	1.68	3.00	1.50	2.50	0.375
Arterial line placement	8	9	1.07	1.52	1.00	1.00	0.500
Arthrocentesis	3	10	0.43	0.81	0.00	1.00	0.530
Transvenous pacing	4	3	0.57	0.43	1.00	0.00	1.000
Cardioversion	3	10	0.71	1.12	0.00	1.00	0.438
Central line placement	39	36	1.36	1.59	1.40	1.33	0.500
Chest tube placement	6	11	0.93	1.14	1.00	1.00	0.688
Dislocation/fracture reduction	22	23	1.38	1.97	1.50	2.25	0.031*
Incision and drainage	8	13	0.86	1.74	1.00	1.50	0.063
Intraosseous access	2	0	0.43	0.00	0.00	0.00	0.500
Laceration repair	21	35	1.81	2.97	1.50	2.67	0.188
Lumbar puncture	10	12	1.07	1.26	1.00	1.00	0.750
Nerve block	5	9	0.50	0.88	0.00	1.00	0.469
Paracentesis	5	11	0.57	1.14	1.00	1.00	0.125
Pediatric endotracheal intubation	7	5	6.24	1.93	1.00	1.00	0.563
Pediatric medical resuscitation	21	31	3.53	4.95	3.00	5.33	0.297
Pediatric trauma resuscitation	19	23	1.75	2.02	1.50	2.00	0.578
Pericardiocentesis	3	2	0.43	0.29	0.00	0.00	1.000
POCUS Cardiac[e]	43	50	1.32	1.90	1.63	1.87	0.125
POCUS Lung	9	23	0.98	1.20	1.00	1.00	0.313
POCUS Abdomen[f]	43	57	1.04	1.44	1.25	1.33	0.469
POCUS: DVT, MSk, and Other[g]	13	14	1.40	0.98	1.33	1.00	0.219
Procedural sedation	15	33	2.21	1.86	2.00	2.00	0.578
Thoracentesis	4	4	0.57	0.57	1.00	1.00	1.000
US–guided peripheral IV line[h]	0	6	0.00	0.57	0.00	1.00	0.125

No, authors do not have interests to disclose

399 What Do Emergency Medicine Residents and Attending Physicians Think of the ACGME Milestones?

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Study Objectives: Evaluating emergency medicine residents is a crucial component of their education, and the ACGME Milestones are the cornerstone of those evaluations. While the ACGME identifies 22 criteria for evaluations, it is unclear how residents and non-core faculty feel about this number of milestones and how they are best utilized. We sought to determine how residents and attending physicians (core and non-core) about their views on the milestones and how best they can be utilized for resident education and evaluation.

Methods: All resident and attending physicians at a three-year emergency medicine residency program were questioned about the ACGME milestones using an anonymous Google Forms survey. They were asked if they were aware there were over 20 milestones (even though this is reviewed with residents and faculty at a minimum twice a year) and how many milestones would be ideal for evaluation. They were asked if they believed that the milestones should be "weighted" in order to prioritize them and make an overall evaluation of residents. They were also questioned about who should be responsible for completing the clinical milestone evaluations (residency leadership, core faculty only, full time attending physicians or all emergency physicians - including part-time). Descriptive statistics and 95% confidence intervals were calculated. Resident responses were compared to attending physician responses using a 2-tailed t-test to determine if there were differences between the two groups.

Results: 47 physicians completed the survey: 22 attending physicians and 25 residents. Only 51% (95% CI:37%,66%) were aware that there were over 20 milestones. 55% thought there should be 5-10 milestones, and 40% thought there should be 10-20 milestones; only 4% thought there should be more than 20. 89% (95% CI: 80%,98%) believed milestones should be weighted according to priority in order to make an overall evaluation of the residents. The milestones believed to be most important were Patient Care 1: Emergency Stabilization (79%), Medical Knowledge 2: Treatment and Clinical Reasoning (64%), Patient Care 2: Performance of a Focused History and Physical (55%). The milestones felt to be least important were Systems-Based Practice 4: Physician Role in Healthcare Systems (77%), Interpersonal and Communication Skills 3: Communication within Healthcare System (66%), and Systems-Based Practice 2: Quality Improvement (62%). 32% believed that only core faculty should evaluate residents, while 43% believed all full time attending should. No one believed only residency leadership should do the evaluating. When separating residents and attending physicians, there were no statistical differences between the groups in any of the questions.

Conclusions: Both residents and attending physicians tend to believe there are too many milestones and that the milestones should be weighted in order to develop a comprehensive evaluation of each resident. Both groups tend to think that all full time attending physicians should participate in the resident milestone evaluations, and not just residency leadership.

No, authors do not have interests to disclose

400 Comparison of Characteristics of Pediatric Behavioral Health Emergency Department Visits, Transfers, and Admissions in California Before and During the COVID-19 Pandemic (2017-2021)

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Background: The prevalence of behavioral health (BH) conditions among children and adolescents has been increasing over the last decade. There are indications that the psycho-social impact of the COVID-19 pandemic has exacerbated this trend. BH-related emergency department (ED) visits can be used as a measure of access to BH care.

Study Objective: To assess and compare patient and community-level characteristics associated with pediatric ED visits for BH diagnoses in pre- and pandemic periods.

Methods: This was an retrospective secondary data analysis of the California Department of Health Care Access and Information Emergency Discharge database. We examined all ED visits with a primary BH diagnosis. Age was categorized as 6-13 and 14-17 years. BH visits were categorized by Clinical Classifications Software groupings of ICD-10 codes. Disposition categories were defined as discharge from the ED, and hospital transfer/admissions (a proxy for severity). We examined pre-pandemic (3/1/2017-3/16/2020) and pandemic (3/17/2020-3/31/2021). We defined the rate of BH ED visits as the number of BH ED visits per thousand ED visits for patients 6-17 years. Regression models examined odds of BH ED visits and transfer/admissions adjusting for gender, race/ethnicity, language, payor category, distance from hospital, estimated percentage over the federal poverty line (FPL), rural vs urban setting, and teaching vs non-teaching hospital.

Results: There were a total of 153,151 pre- and 32,232 pandemic visits. For both time periods, the most common BH visit diagnosis was suicide attempt or ideation, followed by mood, anxiety, substance use, and psychotic disorders. Pre-pandemic, we found that odds of primary BH ED visits were lower for males (OR: 0.64; 95% CI=0.63-0.65), Black (OR: 0.74, 95% CI=0.73-0.76), Asian (OR: 0.76; 95% CI=0.74-0.78), Spanish-speaking (OR: 0.77; 95% CI=0.76-0.79), Chinese-speaking (OR: 0.62; 95% CI=0.53-0.73), and publicly insured (OR: 0.76; 95% CI=0.75-0.76). Odds were higher for patients >3-4x the FPL (OR=1.20; 95% CI=1.19-1.21) and living in rural areas (OR 1.13; 95% CI=1.11-1.15). Similarly during the pandemic, we found that odds of primary BH ED visits were lower for males (OR: 0.56; 95% CI=0.55-58), Black (OR: 0.80, 95% CI=0.76-0.83), Asian (OR: 0.85; 95% CI=0.80-0.90), Spanish-speaking (OR: 0.79; 95% CI=0.76-0.82), and publicly insured (OR: 0.81; 95% CI=0.79-0.84). Odds were also higher for patients >3-4x the FPL (OR=1.18; 95% CI=1.15-1.22). The odds of transfer/admissions were higher for patients identifying as Asian and Black compared to White pre-pandemic (OR: 1.15; 95% CI=1.10-1.20; OR: 1.08; 95% CI=1.03-1.13, respectively). Combining both time periods, the odds of primary BH ED visits and odds of transfer/admissions were higher during the pandemic, compared to pre-pandemic (OR: 1.53; 95% CI=1.51-1.55; OR=1.29; 95% CI=1.26-1.32, respectively). Otherwise, covariate point estimates were similar in both models.

Conclusions: Our study shows an increased likelihood of BH ED visits and transfer/admissions during the pandemic compared to the pre-pandemic. Estimates are likely biased low given primary BH ED visits were examined. These findings may be explained by increased prevalence or decreased access to BH care during the pandemic. The decreased odds of ED visits of males, non-English speaking, non-White, and publicly insured does not necessarily suggest less BH prevalence or access by itself in both time periods. The decreased odds of BH ED visits among Asian and Black patients yet increased odds of transfers/admissions may suggest higher acuity upon ED presentation.

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401 Emergency Department Outcomes Associated With Police-Involved Transport: A Propensity-Matched Cohort Study

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Background: Police involvement in medical and psychiatric crisis response has generated both concern and controversy. Police, rather than emergency medical service (EMS), transport of patients to emergency departments (EDs) is highly variable and guided by circumstances of individual scenarios or local decisions. While outcomes associated with police transport among trauma patients have been studied, outcomes for patients transferred by police to EDs for medical and/or psychiatric evaluation is not well understood. We investigated the incidence of police transport of patients to the ED and assessed whether this practice is associated with differences in ED clinical care and outcomes.

Methods: This is a retrospective cohort study of electronic health record data of adult patients (age ≥18 years) from a single, large, academic health system consisting of 6 emergency departments (EDs) in New York City between January 1, 2012, and March 31, 2022. The annual incidence of police transport of patients to the ED was calculated. Police transport and EMS patients were allocated via nearest neighbor, propensity matching without replacement. We compared ED clinical care outcomes of disposition, ED length of stay, and rates of chemical sedation.

Results: Over the study period, a total of 2,008 patients were transported by police and 455,894 patients were transported by EMS. The rate of police transports over total ED patients increased from 3 per 10,000 in 2012 to 14 per 10,000 in 2022. The most common chief complaints associated with ED visits for patients transported by LEO were Psychiatric evaluation/problem (36%), Unspecified/Other (28%), chest pain (2%), assault victim (1.6%), and pain (1.5%). Of all LEO transported visits, 825 (42.1%) had chief complaints related to mental health or substance use. In a propensity score-matched multivariable regression model, police transport was associated with a decreased odds of admission to the hospital compared with EMS transport (odds ratio [OR], 0.78; 95% CI, 0.66-0.92 P<.001). Average length of stay in the ED was shorter for police-transported patients compared to EMS-transported patients [β = -34.9, CI [-48.8, -21.1]. Police transport was associated with an increased odds of receiving chemical sedation (odds ratio [OR], 1.52; 95% CI, 1.22-1.88 P<.001) and no difference in the odds of receiving a psychiatric consult during the ED visit.

Conclusion: Police transport of patients to the ED increased substantially in the past decade. Patients transported by police spend less time in the ED, are less likely to be admitted, and are more likely to receive sedation while there. Patients seeking healthcare the ED already represent a uniquely vulnerable population, and patients arriving by police transport appear to be differentiated by a unique and important set of characteristics and outcomes. Reasons for these differences, for the outcomes of this differential means of ED utilization, and for the increasing rates of police transport should be further investigated. Future work should explore reasons behind the differences in ED clinical outcomes for patients transported by police.

No, authors do not have interests to disclose

EMF

402 Defining Diagnostic Excellence for the Emergency Department Setting: Results From a Literature Review and Expert Panel Discussion

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Study Objectives: A recent report estimated that 7 million emergency department (ED) patients experience diagnostic errors each year in the U.S., leading to misdiagnosis-related harms for 2.5 million patients and potentially preventable serious harms for 350,000. The report sparked controversy in the emergency medicine community in part because its definition of diagnostic error was not developed for use in the emergency department setting—where management and disposition are prioritized over determination of definitive diagnoses. Our objective was to identify existing definitions of diagnostic error or diagnostic excellence, extract concepts embedded in those definitions, and convene a multi-disciplinary panel to rate the relevance and importance of those concepts for incorporation into a definition of diagnostic excellence that will guide future research and quality improvement efforts in emergency medicine.

Methods: We conducted an environmental scan of peer-reviewed and gray literature using prespecified search terms to identify existing definitions of diagnostic error, diagnostic excellence, and related terms. Inclusion criteria were: 1) definition was related to diagnosis in healthcare and 2) definition was intended to guide clinical practice, quality improvement, or research activities. Definitions highlighting unfavorable or favorable practice were included. Our search strategy included PubMed, Google Scholar, Web of Science, Google as well has hand searches of key stakeholder web sites (Institute for Healthcare Improvement, National Academy of Medicine, Society to Improve Diagnosis in Medicine, Society for Medical Decision Making, Agency for Healthcare Research and Quality, and Gordon and Betty Moore Foundation). Our search was limited to documents published in or after 2015 (the year the National Academy of Medicine published its report Improving Diagnosis in Heath Care, which shifted the field of diagnostic excellence substantially). When we found articles with definitions meeting inclusion criteria, we also reviewed their reference lists to identify other sources. For definitions that met inclusion criteria, we extracted key concepts and grouped concepts into 5 domains: diagnostic label, diagnostic process, outcomes resulting from diagnosis, patient-centeredness, and systems of detection.

Results: We assembled a library of 431 documents that were identified through the search strategy. After full-text review of all documents, we identified 9 distinct definitions meeting inclusion criteria. The terms defined were: diagnostic error, undesirable diagnostic event, diagnostic safety event, and diagnostic excellence. We also encountered the term diagnostic missed opportunity, though this was used as a synonym for diagnostic error. The 9 definitions contained a total of 24 concepts in 5 domains. *diagnostic label*: accuracy, precision, verification; *diagnostic process*: timeliness, divergent practice, optimal process, cost-effectiveness, efficiency, communication, missed opportunity, information availability, evidence-based processes, overtesting, equity; *outcomes resulting from diagnosis*: patient harm, impact on management, overtreatment; *patient-centeredness*: patient-centeredness, convenience, pursuit of relevant knowledge, interpretability, social context; *systems of detection*: measurability, specificity.

Conclusion: We identified 24 concepts that have been used in prior definitions of diagnostic error and diagnostic excellence, and we grouped these concepts into 5 domains, including diagnostic label, diagnostic process, outcomes resulting from diagnosis, patient-centeredness, and systems of detection. In May of 2024, we will convene an expert panel to vote on the relevance and importance of each concept for inclusion in our definition of diagnostic excellence. The panel will also determine whether to create an additional definition of diagnostic missed opportunity, since that term might be more amenable to operationalizing in ED-based quality improvement and research efforts.

No, authors do not have interests to disclose

EMF

403 Barriers and Facilitators to Addiction Treatment Access From the Emergency Department Among Black Individuals With Opioid Use Disorder

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Study Objectives: Significant racial disparities in receipt of emergency department (ED)-initiated buprenorphine and engagement in subsequent addiction treatment exist despite robust evidence in support of their practice. Little is known about the barriers and facilitators Black individuals with opioid use disorder encounter to engage in addiction treatment subsequent to their ED encounter. The goal of this study is to elicit patterns of barriers and facilitators to engaging in addiction treatment among Black individuals with opioid use disorder subsequent to ED encounter.

Methods: We conducted 20 semi-structed individual interviews by telephone of Black participants previously enrolled in the National Institute on Drug Abuse Clinical Trials Network (NIDA CTN)-0099, a multi-site randomized clinical trial comparing sublingual and extended-release injectable ED-initiated buprenorphine for untreated opioid use disorder. Participants were enrolled across six ED sites: Cooper (NJ), Henry Ford (MI), Grady (GA), and Alameda Health System (CA) hospitals: Highland and San Leandro. Data were coded and categorized into common themes within four larger domains: Attitudes, Subjective Norms, Perceived Behavioral Control, and Health Care System, a theoretical framework grounded in both the National Institute on Minority Health and Health Disparities Research Framework and Theory of Planned Behavior.

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Results: Participants cited several barriers to engagement in subsequent addiction treatment including: 1) structural factors including transportation, housing insecurity, and insurance issues; 2) stigma surrounding addiction and addiction treatment including medications for opioid use disorder; 3) uncertainty navigating health systems and steps needed to continue addiction treatment; 4) racism experienced within the healthcare system; 5) mental health issues; and 6) polysubstance use. However, facilitators included: 1) social support among family and friends in pursuing addiction treatment; 2) positive attitudes towards medications for opioid use disorder; 3) positive experiences with supportive ED staff; and 4) high self-efficacy in continuing with addiction treatment including medications for opioid use disorder.

Conclusion: Black individuals with opioid use disorder encounter several barriers to engaging in addiction treatment subsequent to their ED encounter, exacerbating existing racial disparities. However, several factors that facilitate engagement in addiction treatment subsequent to ED encounter were noted. Future studies should evaluate ED-based interventions that address racial disparities in addiction treatment access by mitigating these identified barriers and incorporating facilitators.

No, authors do not have interests to disclose

404 Emergency Medical Treatment and Labor Act (EMTALA) Citations Involving On-Call Obstetric and Gynecologic Responsibilities, 2011-2023

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Study Objectives: The Emergency Medical Treatment and Labor Act (EMTALA) requires hospitals to maintain a detailed and accurate list of on-call physicians to provide stabilization of emergent conditions or active labor or to field higher level of care transfer requests for emergency department (ED) patients from other facilities requiring specialized services for stabilization of emergent conditions. EMTALA also requires hospitals to maintain written policies and procedures detailing the responsibilities of on-call physicians, including, hospital-designated timeframe to respond to a request for evaluation, and policies and procedures related to when an on-call person is unavailable or cannot be reached. Individual hospitals are responsible for curating an adequate specialty on-call panel which meets the needs of the community served and matches resources available at the hospital. ED providers are required to request assistance from on-call providers if specialized services are required for stabilization of an emergent condition or active labor, regardless of the patient's insurance status or ability to pay. Prior work has shown that 15% of EMTALA citation events involve obstetric and gynecologic (OBGYN) responsibilities. This study characterizes and describes EMTALA citation events related to on-call responsibilities involving OBGYN patients and providers, and related administrative responsibilities.

Methods: Inspection summaries for EMTALA citation events (January 2011-June 2023) were obtained from the Centers for Medicare and Medicaid Services (CMS). Events involving on-call responsibilities were identified using the relevant CMS EMTALA deficiency tag (2404). Trained reviewers systematically screened inspection summaries for keywords suggesting OBGYN involvement (eg, gyn-, preg-, obstetr-), and recorded key features related to the clinical or administrative context contributing to EMTALA citation event in a REDCap database. Key features and themes identified are characterized and described.

Results: Of 2,954 EMTALA citation events, 276 (9%) involved on-call deficiencies. Among the 25 (9%) of on-call deficiency events involving OBGYN patients or providers: 13 involved physicians, including two ED providers failing to appropriately contact available on-call OBGYN specialists, and one failing to accept transfer of a laboring patient from another hospital's ED. Among 10 events where OBGYN specialists failed to evaluate or stabilize patients in timeframes requested by hospital policy or were unreachable, eight occurred in an ED and two in labor and delivery. Twice, hospitals were cited when on-call physicians listed for OB-trauma failed to evaluate non-trauma emergencies. There were 12 events that were procedural in nature including failure of on-call list maintenance (eg, group rather than individual name listed) or to maintain adequate policies and procedures for when an on-call provider was unavailable or unreachable.

Conclusion: Among on-call deficiencies only 9% involved OBGYN patients, providers, or administrative responsibilities. In comparison, deficiencies involving OBGYN responsibilities account for 15% of all EMTALA citation events, indicating EMTALA citations related to on-call responsibilities involving OBGYN services are relatively uncommon. Nevertheless, administrators should ensure that on-call lists include specific physician names and that policies exist for when on-call specialists are unreachable. On-call sub-specialists (eg, OB-Trauma) should be prepared to provide broader stabilization services if credentialed to provide services needed for stabilization.

No, authors do not have interests to disclose

405 Emergency Surgery Following a Return Visit to the Emergency Department: An Analysis of 454,330 Emergency Department Visits

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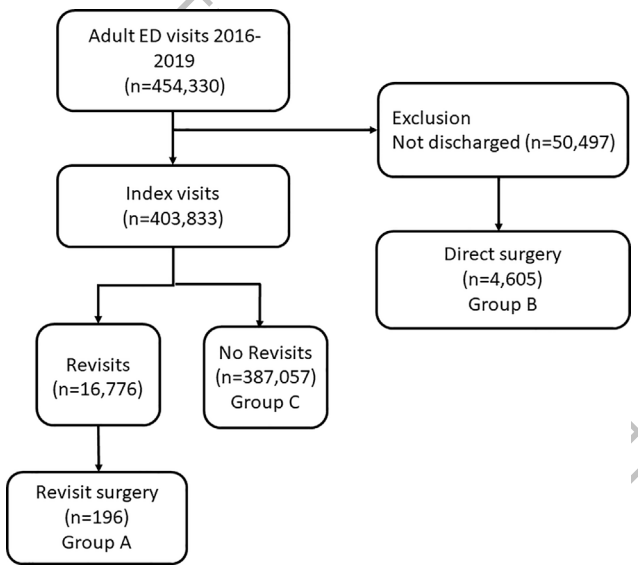
Background: Although return emergency department (ED) visits have been widely studied, little is known about emergency surgery following a return visit to the emergency department. We aimed to 1) estimate the incidence of emergency surgery following a return ED visit, 2) investigate factors associated with these adverse events, and 3) compare patients who received surgery after a return visit to the ED (revisit surgery) with those who received surgery during the index ED visit (direct surgery).

Methods: This was a retrospective cohort study using electronic clinical warehouse data from a tertiary medical center in Taiwan. We retrieved data from 454,330 adult ED visits from 2016 to 2019. Patient demographics and computerized triage information were extracted. A return ED visit within 72 hours of the index visit was identified. Emergency surgery following the return ED visits with 24 hours was also identified. Factors associated with emergency surgery were analyzed using logistic regression. The inpatient outcomes after emergency surgery included mortality and hospital length of stay (LOS). Comparisons were made between those who received surgery after a return visit to the ED (revisit surgery) and those who received surgery during the index ED visit (direct surgery) using logistic and linear regression.

Results: Of the 454,330 visits, 4,605 (1.0%) received direct surgery during the index ED visit. Among the 403,833 patients who were discharged during the index ED visit, 16,776 (4.2%) returned to the ED within 3 days. Of them, 196 (1.1%) received emergent surgery. Multivariable analysis showed that factors associated with emergent surgery after ED revisits included the following: triage level, male sex, complaint of abdominal pain, older physician age, summer season, and presenting time. The most common reasons for emergency surgery included appendicitis, pregnancy issues for Cesarean section, and fractures. Compared with the direct-surgery group, the revisit surgery group had a shorter hospital LOS (adjusted difference, -1.90 days; 95% confidence interval [CI], -3.27 to -0.53). The inpatient mortality rates were similar between the two groups (revisit vs direct surgery adjusted odds ratio, 0.37; 95% CI, 0.09 - 1.54).

Conclusions: We found a very small fraction of discharges (0.05%) received emergent surgery during the return ED visits. We identified patient and physician factors that may be used to prevent these adverse events. Nonetheless, patients who received surgery after a return visit to the ED did not demonstrate poorer outcomes compared to those who received surgery during the index ED visit.



No, authors do not have interests to disclose

406 WITHDRAWN

407 The Effect of Naloxone Administration on the Treat and Release Length of Stays in Emergency Department Patients With Suspected Opioid Overdoses

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Study Objectives: National drug-involved overdose deaths spiked in 2020 and 2021 after some years of slowing. The impact of naloxone administration in patients with suspected opioid overdoses on patient length of stay (LOS) in the emergency department (ED) during this period is not well known. The objectives of this study are ED treat and release (T&R) LOS impact with: (1) pre-hospital naloxone administration; (2) naloxone re-dosing in the ED; (3) presence of co-ingestion; (4) method of patient arrival to the ED.

Methods: This retrospective cohort study was conducted at an urban 85K visit regional tertiary hospital ED in a New York State (NYS). The location is in a downstate county that demonstrates NYS opioid dashboard statistics in 2021 of (1) 20% higher rate of overdose (OD) deaths involving any opioid vs remainder NYS, (2) 27% higher ED visit rate involving any opioid overdose vs remainder NYS, (3) 13% higher ED visits and hospital discharges involving opioid abuse, dependence, and unspecified use vs remainder NYS. The subjects are a convenience sample of ED patients who received a medication order for naloxone for presumptive opioid OD in 2021. Patients who received naloxone for iatrogenic opioid use or as part of the "coma cocktail" were excluded. Identification of patients was via query of the Allscripts EHR. The data recorded was patient demographics, ED mode of arrival (EMS vs ambulatory), pre-hospital naloxone, co-ingestion, pre-hospital and ED redosing of naloxone, ED naloxone administration route, opioid and co-ingestion drug type, and ED LOS. Analysis was performed with descriptive stats, basic sample stats, and 2 sample T-test with significance $p<0.05$.

Results: Sixty-five subjects were identified, mean age 40 (SD 12), M 81%. The ED LOS for all subjects treated for opioid OD is 355.6 (SD 254.6) minutes (min). The LOS in subjects: with EMS pre-hospital naloxone (416 min 95% CI 131.5) vs no pre-hospital naloxone (327 min 95% CI 95.5), ambulatory arrival with pre-hospital naloxone (416 min 95% CI 131.5) vs no pre-hospital naloxone (318 min 95% CI 119.5), ambulatory arrival (358.2 min 95% CI 86) vs EMS (346 min 95% CI 191), with co-ingestion (368.9 min 95% CI 92.8) vs no co-ingestion (340.5 min 95% CI 130.5), with initial ED naloxone administration intravenous (377.7 min 95% CI 89) vs other route (262.4 min 95% CI 162.9) did not achieve significance. The LOS in subjects who required additional ED doses of naloxone (532 min 95% CI 236.8) vs no additional dose (295.1min 95% CI 59.3) was significant; $p=0.027$.

Conclusion: Patients requiring additional doses of naloxone in the ED for opioid overdoses may have longer lengths of stays prior to discharge. Expanded studies will improve understanding of the factors influencing escalating length of stays in the ED in patients receiving treatment for opioid overdose.

No, authors do not have interests to disclose

408 Evaluating the Impact of the Stroke Stop Protocol on Time to CT for Stroke Patients in a University Hospital Emergency Department

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Background: Duke University's emergency department, a Comprehensive Stroke Center, assessed roughly 2,000 adult patients suspected of acute stroke. Rapid diagnosis and treatment are vital in acute stroke to prevent the severe consequences of delayed care. A critical measure of stroke treatment efficacy is the "time to CT," the duration from hospital arrival to completion of the initial non-contrast head CT scan. This diagnostic step is essential for determining stroke type and appropriate treatment. To enhance this process, the Duke emergency department (ED) implemented StrokeStop, a new protocol facilitating direct transfer of stroke patients from the Emergency Medical Services (EMS) bay to the CT scanner.

Methods: We evaluated the Stroke Stop intervention using a pre-post study design. The intervention was implemented by July 2022. Prior to the intervention, patients arriving via EMS with suspected stroke were first taken to a registration desk past the CT scanner, resulting in significant delays as they had to backtrack for imaging after initial triage. The intervention streamlined the initial evaluation process by establishing the Stroke Stop, a designated area directly outside the CT scanner along the EMS route. Here, a pre-assembled team of Emergency Medicine and Neurology physicians, nurses, and registration personnel awaited the patient's arrival, reducing delays and confusion. The primary outcome measured was the time to CT. Data from this study was extracted from Duke ED's electronic health records and encompassed eligible patients from January 2021 to April 2024.

Results: The study involved 3,966 patient encounters suspected of stroke, averaging 116 patients per month with a standard deviation of 15. Prior to the intervention, the average of the monthly median time to CT was 25 minutes (interquartile range [IQR] 22, 26.5). In total, the data collected spans 18 months before and 22 months after the implementation of StrokeStop. Post-intervention, the average of the daily median time to CT decreased to 20 minutes (IQR: 10, 22).

Conclusions: The implementation of the Stroke Stop protocol has improved the efficiency of initial diagnostic processes for suspected stroke patients by reducing the average time to CT scan completion. Further research is warranted to assess the long-term impact of this protocol on patient outcomes and to explore potential improvements in other areas of emergency stroke care.

No, authors do not have interests to disclose

409 The Impact of Level Loading in a Large Academic Medical System

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Study Objectives: Emergency department (ED) crowding is recognized as a national crisis. EDs have seen increased volumes providing emergent and non-emergent care for all patients. Coupled with a lack of inpatient capacity, the result is worsening patient boarding. This crisis has escalated with increased patient volumes and acuity, with studies showing that extended boarding times can raise mortality rates. Our hospital system previously implemented a front-end nurse navigator program that directs EMS based on real-time capacity metrics. This system also facilitates level-loading between two campuses to optimize bed availability after admission. Level-loading is a strategy that distributes patient capacity across multiple hospitals to reduce crowding in emergency departments. Our study evaluates the impact of this level-loading on ED throughput from the transferred patient perspective and the effect level loading has on sending and receiving campus ED operations to evaluate for unintended operational consequences by analyzing transfers between the two hospitals.

Methods: We performed a retrospective observational study on two EDs in a single health system. These EDs see more than 140,000 visits annually in the same city. An EHR extraction was performed to collect structured data such as patient demographics, diagnosis, and ED occupancy level of both departments. Patients were categorized as transferred to another campus or admitted to the same campus. Those transferred were further categorized as avertible, as defined by services available on both campuses or inevitable, as defined by services only available on one campus, necessitating the transfer for the particular service. Propensity score matching was then used to match load-balanced patients with patients who were not load-balanced based on clinical and operational characteristics at the time of the admission decision. We then performed a regression adjusting for these characteristics to differentiate between outcomes. Primary outcomes focused on the patients who were load balanced, examining their boarding times and the effect of load balancing on their inpatient length-of-stay. Secondary outcomes focused on the ED level performance metrics for both campuses.

Results: A total of 42,219 admissions were included. Of these, 2,417 (5.7%) were electively transferred from the main academic ED to the community campus for admission, and 181 (0.43%) were electively transferred from the community ED to the main academic site. For primary outcomes, we found that the boarding time in the ED for those who were level loaded was significantly shorter by 3.56 hours ($p<0.01$). There was no difference on their subsequent inpatient length-of-stay, as defined as time from arrival to receiving campus for admission to discharge from the hospital. For secondary outcomes, we noted that level loading did not have any significant effects on the sending campus's ED door-to-room times and "left without being seen" numbers.

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With regards to the receiving campus's ED, there was no significant effect on the overall boarding times.

Conclusion: Load-leveling decreases the boarding times for the patient transferred to an available bed. Once admitted, we do not find evidence that these patients are discharged any later than their counterparts who are not level-loaded. Level loading can be considered an effective way to reduce individual patient boarding times without significantly disrupting the operations for either the sending or the receiving departments. As boarding continues to climb nationally and threaten patient safety, load-leveling can be a tool for hospital systems to improve patient throughput.

No, authors do not have interests to disclose

410 Physician Modifiers Associated With the Evaluation of Suspected Child Physical Abuse in the Pediatric Emergency Department

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Background and Study Objectives: Child physical abuse affects at least 1 in every 7 children in the US, accounting for significant morbidity and mortality in children less than 2 years of age. National guidelines by the American Academy of Pediatrics (AAP) have been published on the evaluation of suspected child physical abuse, stating the lasting effects of abuse, highlighting the risk factors for abuse and abusive injuries that are frequently overlooked, as well as the evaluation strategies to identify suspected child physical abuse. Physicians in emergency departments (EDs) play a crucial role in early identification and intervention to protect abused children. However, little is known about medical providers' knowledge, agreement, and compliance with child physical abuse recommendations. The objective of this study is to assess physicians' knowledge, agreement, and practices on the evaluation of suspected child physical abuse.

Methods: An online survey was administered among a representative sample of providers with a joint interest in PEM through the PED-EM-Listserv® in Fall, 2023. The survey was developed based on key components of the AAP's clinical report on the evaluation of suspected child physical abuse. The survey was comprised of historical, and physical risk factors associated with child physical abuse, evaluation based on skeletal injuries, screening for occult injury, clinical scenarios, and demographics. The level of agreement with historical factors, the likelihood of raising concern about child physical abuse based on physical factors, and clinical scenarios were measured on a 5-point Likert-type scale. Evaluation of skeletal injuries and screening of occult injuries were measured with dichotomous variables.

Results: We included 228 responders, of which 55% reported knowing the content of the AAP clinical report on child physical abuse. Respondents reported 90% agreement with raising concern for child physical abuse based on historical factors (alpha 0.796), and 94% reported a high likelihood based on physical exam findings (alpha 0.809). About 80% of responders would evaluate suspicion of physical child abuse in the presence of high-risk skeletal injuries (alpha 0.311). Only 39% of respondents were practice-compliant in the application of knowledge when indicating the likelihood of raising concern for suspicion of child abuse. However, in the theoretical application of knowledge, less than 1% of respondents were compliant with the occult injury screening for children 0 to 12 months (alpha 0.258), and 12-24 months of age (0.279). About 93.9% of respondents had institutional clinical pathways, but only 79.4% had clinical pathways to evaluate child physical abuse. Respondents in a free-standing children's hospital setting had the highest proficiency in the practical application of knowledge.

Conclusion: Providers shared good agreement about the historical and physical components associated with the evaluation of child physical abuse. However, respondents showed poor practical application of knowledge in the application of laboratory and radiologic studies for the evaluation of suspected child physical abuse. The assessment of providers' knowledge and practice characteristics for the evaluation of suspected child physical abuse can help develop initiatives to improve patient care, decrease child morbidity, and standardize the identification and workup of child physical abuse in the ED.

Table 1. Demographic characteristics of participating providers (N=228).

Characteristics	Survey responders n (%)
Sex	
Female	156 (68.4)
Male	66 (28.9)
Information not available or prefer not to answer	6 (2.7)
Training	
Pediatrics-PEM fellow	185 (81.1)
Pediatrics residency	13 (5.7)
Other medical profession	10 (4.4)
EM residency	9 (3.9)
EM-PEM fellow	8 (3.5)
PEM grandfathered	2 (0.9)
Dual EM/pediatrics residency	1 (0.4)
PEM board eligible/certified	
Yes	163 (71.5)
No	50 (21.9)
Not applicable	12 (5.3)
Information not available	3 (1.3)
Current clinical role	
PEM attending	159 (69.7)
PEM fellow	40 (17.5)
Advanced practice provider	11 (4.8)
General EM practice/ retired	9 (3.9)
Other	6 (2.6)
Information not available	2 (0.9)
Resident	1 (0.4)
Years of experience/medical practice after graduating medical school	
≤ 10	108 (47.4)
11 - 20	57 (25)
21 - 30	26 (11.4)
≥ 31	21 (9.2)
Information not available	16 (7)
Practice setting	
Free-standing children's hospital	132 (57.9)
Children's hospital within general hospital	58 (25.4)
Non-Children's hospital	30 (13.2)
Urgent care center or other	6 (2.6)
Information not available	2 (0.9)
Hospital type where physician practices ≥50% of time	
University-based/ Academic	137 (60.1)
Community/ Academic	71 (31.1)
Community/ Non-Academic	19 (8.3)
Information not available	1 (0.4)
Estimated annual census (total patients)	
< 10,000	1 (0.4)
10,001-20,000	22 (9.6)
20,001-40,000	54 (23.7)
40,001-60,000	50 (21.9)
≥ 60,001	97 (42.5)
Information not available	4 (1.8)
Estimated annual census (pediatric patients)	
0 to 10%	3 (1.3)
11% to 25%	21 (9.2)
26% to 50%	3 (1.3)
51% to 90%	2 (0.9)
≥91%	198 (86.8)
Information not available	1 (0.4)
Primary practice area	
Urban	157 (68.9)
Suburban	68 (29.8)
Rural	3 (1.3)
Region	
Northeast	87 (38.2)
South	61 (26.8)
Midwest	33 (14.5)
West	29 (12.7)
East	7 (3.1)
Northwest	6 (2.6)
Canada or other non-US country	5 (2.2)

EM = emergency medicine PEM = pediatric emergency medicine,

No, authors do not have interests to disclose

EMF 411 Dose-Finding Study of Intranasal Midazolam for Procedural Sedation in Children

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Study Objective: Intranasal (IN) midazolam has been used for pediatric procedural sedation in the emergency department (ED) for over 20 years, but dosing in children has varied with no clearly identified optimal dose. Our primary aim was to determine the most effective dose of IN midazolam for producing adequate sedation in children.

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Methods: We are conducting a prospective randomized adaptive trial of children aged 6 months to 7 years with lacerations who require IN midazolam to facilitate the repair. A sequential selection procedure is being used to compare IN midazolam doses of 0.2, 0.3, 0.4 and 0.5 mg/kg. This procedure dictates that a dose is removed when it results in 4 fewer adequate sedations compared to the dose with the highest number of adequate sedations. Adequate sedation is defined as a Pediatric Sedation State Scale (PSSS) score of 2, 3 or 4 (out of 5) for ≥95% of the procedure. A score of 0 or 1 represents oversedation resulting in airway intervention/support and/or abnormal vital signs; 5 represents patient movement requiring forceful immobilization. Any instance of a score of 0 or 1 is considered inadequate sedation. Patients are videotaped from time of sedative administration until time of discharge. Adverse events, time to onset of minimal sedation, time to recovery, proceduralist satisfaction, and caregiver satisfaction are also assessed.

Results: Enrollment is ongoing. There are 98 children enrolled to date. Mean age of enrolled children is 3 years (95% CI 2.6, 3.4); 69 (60%) are male; and mean weight of children is 17.6 kg (95% CI 16.4, 18.8). Facial lacerations were repaired in 85 (86.7%) of children; mean length of lacerations was 1.6 cm (95% CI 1.5, 1.8). Based on the sequential selection procedure, the 0.2 and 0.3 mg/kg doses were removed from the study. There have been no serious adverse events to date.

Conclusion: 0.2 and 0.3 mg/kg are not the most effective of the 4 doses evaluated. Enrolment will continue until the sequential selection procedure identifies the optimal dose for producing adequate sedation in children undergoing laceration repair.

No, authors do not have interests to disclose

EMF 412 Enrolling Pediatric Asthma Patients for an Environmental Precision Medicine Research: A Feasibility Study

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Study Objective: Asthma is one of the most common reasons children seek emergency treatment, and asthma exacerbations disproportionately affect minority children. Environmental exposures are important risk factors for poor asthma control and acute exacerbations. It is still largely unknown how hundreds of different environmental factors may contribute to asthma control and outcomes in children. Silicone wristbands have been recently developed as passive samplers of the wearer's personal environmental exposures (ie, their exposome). The goal of this study is to assess the feasibility and usability of using silicone wristbands and ecological momentary assessment (EMA) to measure the personal external exposome and asthma symptoms among minority children with asthma presenting to an urban pediatric emergency department (ED).

Methods: We will recruit 50 children ages 10 – 17 years with a history of asthma but who are not presenting with an acute exacerbation from a pediatric ED for this study. We aim to enroll 25 children with well-controlled asthma and 25 children with sub-optimally controlled asthma. For 14 days, participants will wear a silicone wristband, perform daily spirometry, and receive daily "pop up" EMA surveys to measure their asthma symptoms and use of asthma medications. Silicone wristbands will be mailed back to the study team, and chemical exposures that have permeated into the silicone will be objectively quantified. Using state of the art exposome- wide association methods, we will identify environmental exposures associated with both self-reported and objectively measured asthma symptoms. To assess study feasibility, we will measure total recruitment, study survey response rate, and time to achieve total recruitment.

Results: To date in 8 months we have enrolled 14 total subjects, 50% male, with a median age of 14.5 years. Participants answered the asthma symptom questions via the EMA smart phone app 73% of the time. Five participants reported cough during the 14-day study period, four participants reported wheezing, and five reported shortness of breath, but no participants reported visiting a primary care, urgent care, or emergency department during the study period. As for study compliance, 77% of the time participants reported compliance with daily spirometry and 81% of the time participants reported compliance with wearing the silicone wristband. Feedback at 7- and 14-day check ins was that the volume of EMA assessments and surveys was burdensome, but that wearing the silicone wristband was feasible (although one participant found it uncomfortable). When asked to rate the "system" of the silicone wristband, home spirometer, and EMA app, 50% agreed and 50% strongly agreed that they would like to use the system.

Conclusions: After initial participant feedback, we condensed the number of EMA surveys, shifting more asthma control assessments to the time of ED enrollment, and provided subject compensation, all of which has assisted in enrollment. Precision medicine studies are feasible in the pediatric ED setting, however study design needs to consider the volume of assessments to be performed outside of the ED, troubleshooting devices after initial ED enrollment, and compensation for participant activities outside of the ED.

No, authors do not have interests to disclose

413 Can Caregivers Reliably Assess Their Child's Heart Rate and Respiration Rate Using Smartphone or Smartwatch Applications?

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Study Objectives: Caregiver monitoring of heart rate (HR) and respiratory rate (RR) with smartphone or smartwatch applications (apps) may improve the quality of pediatric telephone triage or virtual visits and help determine which patients require in-person evaluation. Our objective was to compare HR and RR measured by caregivers with smartphone and smartwatch apps to simultaneous measurements by nurses in the pediatric emergency department (PED).

Methods: Patients under 18 years were prospectively recruited from a PED at an academic children's hospital between January 5 and June 30, 2023. HR and RR were measured by caregivers and nurses simultaneously. Nurses used pulse oximeters or cardiorespiratory monitors for assessment of HR and visual assessment of chest rise for RR. Caregivers measured RR on a smartphone app and HR on both smartphone and smartwatch apps. Reproducibility was assessed using Bland-Altman (BA) analyses and summarized using Kappa agreement. We surveyed caregivers on their level of comfort with the apps before and after use.

Results: We recruited 213 patients with median (IQR) age of 7 (4 to 13) years. For measurement of RR, no bias was evident, but the limits of agreement (LOA) were wide (between –23 and +24 breaths/minute). For HR measurement by smartphone, caregivers reported consistently lower values than nurses (bias: –22 beats/minute), and LOA was wide (–32 to +75 beats/minute), but with improved performance in older children. On the other hand, HR measurement by smartwatch showed no evidence of bias and the LOA were acceptable (–5 to +5 beats/minute).

Conclusion: When compared with nurse assessed vital signs, our study showed poor performance for caregiver measured vital signs in smartphone apps in children presenting to the PED. However, the smartwatch did reliably assess HR, and caregivers rated it most highly. Next steps include testing the performance of these devices in the home setting.

No, authors do not have interests to disclose

414 Comparison of Emergency Department Management and Disposition Among Adolescents and Young Adults 12-25 Seen for Mental Health Presentations

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Study Objectives: Emergency department (ED) utilization by adolescents and young adults 12-25 years old for mental health care has significantly increased throughout the United States (US) in recent years. Despite proximity of age between

the two groups, available resources and management provided in the ED setting to each group widely differs. This study aimed to examine the differences in care provided and ED disposition decisions made between these two age groups. Additionally, disposition decisions were compared for each age cohort based on presentation of mental health symptoms versus all other reasons at time of visit.

Methods: Weighted data from the 2017-2021 National Hospital Ambulatory Medical Care Survey (NHAMCS) was analyzed to identify ED visits by adolescents (12-17 years old) and young adults (18-25 years old) in the US, then stratified by year. Mental health-related visits were defined as visits with presentation of any symptoms within the "Referable to Psychological and Mental Disorders" module of the NHAMCS (codes 1100-1199), while all other reasons for visit were combined. ED dispositions were categorized into admissions, discharges, and others. Multinomial logistic regressions were performed to compare ED outcomes between mental health-related visits by adolescents versus young adults, as well as for mental health-related visits compared to all other visits for each age cohort using odds ratios (ORs). Models were also adjusted (aORs) for sex, race/ethnicity, length of ED stay, geographic region, and insurance status.

Results: Between 2017 and 2021, 23,764,596 ED visits were by patients 12-25, of which 8,117,440 were by adolescents (34.2%) and 15,647,155 by young adults (65.8%). Mental health-related visits made up 2.9% of all adolescent ED visits and 5.2% of all young adult visits. If presenting with mental health symptoms to the ED, adolescents had 1.42 (95% CI [1.35, 1.48]) times the odds of admission compared to young adults with the same presentation and higher odds (aOR = 1.72, 95% CI [1.33, 2.11) of being admitted compared to adolescents presenting with medical symptoms. Young adults presenting with mental health symptoms had 1.37 (95% CI [1.03, 1.72]) times the odds of admission compared to young adults presenting with all other reasons. Among those who were admitted, if the length of ED stay ranged from 12-24 hours, patients had 1.90 (95% CI [1.52, 2.27]) times the odds of being admitted compared to other lengths of stay regardless of age group and presentation; the odds of admission increased significantly (aOR = 2.05, 95% CI [1.77, 2.33]) if the patient presented with mental health symptoms compared to medical symptoms.

Conclusion: Adolescents presenting to the ED with mental health-related symptoms were at significantly higher odds of admission compared to young adults with similar presentations. As the epidemic of mental health-related ED visits continues to pervade across the US, these findings emphasize the importance of assessing the disparity in disposition decisions made between adolescents and young adults and its reflection on ED capacity of mental health care for this uniquely vulnerable population.

No, authors do not have interests to disclose

415 Use of a Modified Pediatric Early Warning Score to Address Under-Triage of Pediatric Patients in a Mixed-Population Emergency Department

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Study Objectives: The primary purpose of this study was to assess improvement of triage classification in pediatric patients less than 11 years of age after the implementation of a modified Pediatric Early Warning Score (PEWS). Modified PEWS was developed to help quickly identify critically ill children and to monitor for rapid deterioration in clinical status. A secondary outcome was check-in to physician evaluation time of less than 10 minutes for all pediatric patients with a score of 3 or higher. This is an extension of the original research. It aims to increase data and improve the power of the study, while uncovering additional insights and further exposing the effects that the accuracy of triage can have on an entire emergency department team and stay.

Methods: Retrospective chart review at a Level 2 community hospital of patients 10 or younger who had either been admitted to the hospital or transferred to a different level of care or specialty service. Patients with a chief complaint of mental health or overdose/ingestion were excluded from the study. After standardized training, nursing staff automatically provided an ESI score of at least 2 if at any time a patient's PEWS was 3 or greater or if there was a change in clinical status. PEWS was reassessed on an hourly basis. Data was compared to a cohort from 11 months prior (59 patients) to the introduction of the modified PEWS tool with a main target goal of >85% accuracy post-implementation (173 patients through 2022). In a continuation of this original research additional factors were assessed including total length of stay in the emergency department and likelihood of peripheral IV placement based on initial PEWS.

Results: The addition of modified PEWS showed improvement in overall triage accuracy. Data collected from the 11 consecutive months prior to addition of PEWS showed lower triage accuracy compared to post intervention triage accuracy (48.6% vs 93.8%, p<0.001). This surpassed the main target goal of >85% triage accuracy. Door to physician time was subsequently improved by the PEWS tool guiding changes to ESI score in pediatric patients allowing for decreased wait times.

Conclusion: The implementation of this modified PEWS allowed for use of an additional triage tool to identify the clinical features reflected in the sick pediatric patient. Improving triage in this sense has physiological, emotional and financial effects on both the patient and the caregiver.

Components	0	1	2	3
Behavior	Playing/Appropriate	Sleeping	Irritable	Lethargic, Confused, Reduced Pain Response
Cardiovascular	Pink or capillary refill 1-2 second	Pale or capillary refill 3 seconds	Gray or capillary refill 4 seconds OR tachycardia of 20 above normal rate	Gray, Mottled, capillary refill 5 seconds or above OR tachycardia of 30 above normal rate OR bradycardia
Respiratory	Within normal parameters, no retractions	>10 above normal parameters, using accessory muscles	>20 above normal parameters, retractions	Five below normal parameters with retractions and grunting

No, authors do not have interests to disclose

416 Providing Screening and Linkage to HIV Preventive Services for At-Risk 13–17-Year-Olds in a Pediatric Emergency Department: A Two-Year Program Update

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Study Objectives: The Pediatric emergency department (ED) at Los Angeles General Medical Center (formerly LAC+USC Medical Center) serves many teenagers at risk for HIV infection. Often, due to social or financial barriers to outpatient care, the ED is the patient's sole point of contact with the healthcare system. Since May 2022, opt-out non-targeted screening for HIV among pediatric ED patients ?13 years of age has been offered. Among patients screening HIV-negative, risk assessments establish a need for education and eligibility for linkage to outpatient comprehensive prevention services (CPS). Little is known about ED-based screening and linkage to CPS among minors. This abstract describes the demographics and outcomes of program participants over a two-year period.

Methods: ED patients between 13 to 17 years of age that were medically stable, not on an involuntary psychiatric hold, not in the custody of law enforcement, screening negative for HIV were assessed for risk factors by trained navigators. Those meeting eligibility criteria were offered education and linkage to CPS, which could include outpatient primary care, OB/GYN, addiction medicine, or other outpatient specialty appointments where patients could be counseled regarding risk mitigation or medical prevention services. Demographics and outcomes of patients screened and assessed from 5/1/2022 – 3/31/2024 are described.

Results: Overall, 292 (89.6%) of 326 ED patients screening negative for HIV eligible for risk factor assessment were assessed by trained navigators. Among these 292, 139 (47.6%) were found to be eligible for linkage to CPS, of which 27 (19.4%) identified as male, 111 (79.9%) as female, and 1 as transgender. The median age was 16 (range: 13-17), 102 (73.4%) were Hispanic, and 93 (66.9%) had Medicaid. Risk

factors for future HIV transmission reported included high-risk sexual behavior for 117 (84.2%), behavior-modifying drug use in 61 (43.9%), and IV drug use for 2 (1.4%). Linkage to CPS was offered to 102 (73.4%) of those eligible, and among those offered scheduled for 87 (85.3%) and attended for 83 (81.4%). Notably, of 102 patients offered CPS, 85 (83.3%) were female, as were 74 (85.1%) of those who scheduled and 71(85.5%) who attended outpatient CPS appointments. Anecdotally, seasoned navigators reported that many minors found to be eligible for CPS were observed to have extremely limited and or absent baseline knowledge about sexually transmitted infections (STIs) generally or HIV specifically with regards to transmission or prevention.

Conclusions: Among minors screening negative for HIV at a safety-net Pediatric ED, nearly half reported risk factors for HIV exposure, which qualified them for education and linkage to CPS. Most reporting risk factors for HIV exposure were female and high-risk sexual activity was the most identified risk factor for HIV exposure. Seasoned navigators observed very limited and often absent baseline knowledge of HIV among this group, which may be explained by limited formal education about safer sex practices and STIs, including HIV, during pandemic-era learning. This generation may benefit from initiatives to bridge anecdotally identified knowledge gaps. CPS attendance rates among those offered indicate a general openness to participate in preventive care.

Yes, authors have interests to disclose
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417 Despite Their Concerns, Residents Have a Poor Understanding of ACGME Duty Hours Rules

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Study Objectives: Adhering to ACGME's Clinical and Educational Hours rules is a high priority in our residency. A review by the residency director found zero scheduled violations in the past three years and the rules are frequently reviewed with the residents. Despite this, some residents report perceived violations of the hours rules. We sought to determine how well residents understand the Clinical and Educational Hours rules.

Methods: Using Google forms, all residents in a 3-year Emergency Medicine (EM) residency were required to complete a questionnaire about their understanding of the ACGME Clinical and Educational Hours rules. Residents were given schedule scenarios and asked if there was a violation. Residents were asked if they had any violations in the past year and to estimate the number of their co-residents who had had violations. They were also quizzed about the specific rules of EM and off-service rotations, and about their responsibilities for reporting them. Descriptive statistics were calculated.

Results: 26 out of 29 residents completed the required survey. The average resident identified if there was an hours violation on the scheduling scenarios 46% (95% CI: 36%, 57%) of the time, and only 2/26 (8%) got all scenarios correct. No resident said they had an hours violation in the past year (although 4/26 (15%) said they were unsure if they did). Despite this, 23% (95% CI: 7%, 40%) said they thought at least 20% or more of the residents had had violations (some residents believing half or even most of residents had experienced violations). 100% of the residents knew they had a responsibility to report hours violations to administration, and 0% reported any. Only 65% (95% CI: 47%, 84%) correctly answered how time spent after a scheduled shift (eg, charting, dispositioning) counted toward the hours rules.

Conclusion: Despite our educational efforts, there is a general misunderstanding about the ACGME Clinical and Educational Hours rules. Although no residents in our program thought they had an hours violation and no residents had reported any to administration, residents seem to think their co-residents are experiencing violations. While these findings may not be generalizable to other programs, program directors should be aware of these perceptions.

No, authors do not have interests to disclose

418 Impact of Chief Complaint and Emergency Department Diagnosis on Length of Stay in Pediatric Appendicitis

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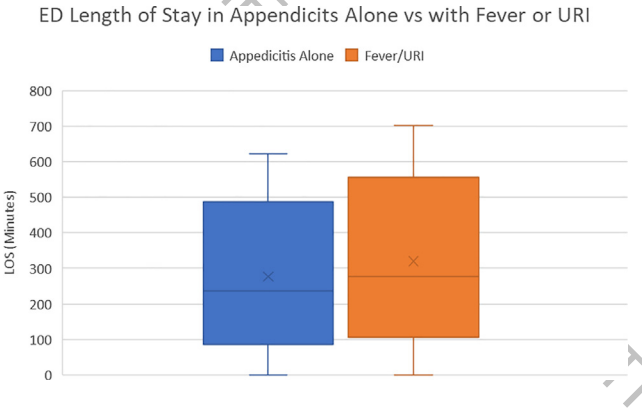
Background: Appendicitis is a common pediatric emergency encountered in United States emergency departments (EDs). However, pediatric patients frequently present to the ED with extraneous complaints such as fever or headache. Such complaints have been demonstrated in previous literature to increase missed diagnosis of appendicitis. Missed diagnosis in EDs is not uncommon and patients often undergo additional diagnostics to evaluate extraneous complaints. Additional diagnostics and workup can increase time to definitive care and contribute to a longer ED length of stay (LOS). This study aims to further categorize if extraneous presenting chief complaints or concomitant non-appendicitis ED diagnoses correlate with ED LOS in pediatric patients with appendicitis.

Study Objective: To determine if extraneous presenting chief complaints or concomitant non-appendicitis ED diagnoses correlate with ED LOS in pediatric patients with appendicitis.

Methods: The National Hospital Ambulatory Medical Care Survey (NHAMCS) was searched for patients less than 18 years of age who had an ED diagnosis of Appendicitis. Visits from 2007-2019 were included, excluding 2016 and 2017 as there was no ED LOS data documented. Patients that were included in the "Fever/URI" group had a chief complaint or additional ED diagnosis of a respiratory illness, SIRS/ sepsis, lab abnormality (ie, leukocytosis), or other general complaint (ie, fever, headache). Patients were included in the "Appendicitis alone" group if they did not have an associated extraneous chief complaint or diagnosis. The difference in ED length of stay was the outcome difference measured.

Results: There were 215 rows resulted, representing 1,128,000 total visits. Appendicitis alone was in 169 rows (905,000 visits), and Fever/URI in 46 rows (223,000 visits). 16 rows (83,000 visits had missing length of stay data and were excluded from analysis). For the Appendicitis alone group, median LOS (IQR) was 236 minutes (172-352). For Fever/URI group, median LOS (IQR) was 276 minutes (213-409).

Conclusion: This study indicates that there was an increase in ED LOS in pediatric patients with appendicitis who presented to the ED with an extraneous chief complaint or who had an associated ED diagnosis other than solely appendicitis. This may be due in part to larger workups including more diagnostics and consults. Atypical presentations, observation time, or delays in diagnostic results may have also contributed. While this study cannot categorize the clinical indications or necessities for each individual patient encounter, this information can help guide anticipated resource needs in the ED. This study also cannot directly link increased ED LOS with changes in outcome. Future studies can aim to identify changes in outcome with increased ED LOS in pediatric appendicitis.



No, authors do not have interests to disclose

419 Determinants of Opioid Overdose Risk in the COVID-19 Era

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Study Objectives: COVID-19 was the deadliest global pandemic in over a century. During the pandemic rates of opioid overdose escalated to an alarming degree. Reasons for the spike in overdoses have been studied but there is surprisingly limited patient-centered information on the immediate proximate risks of overdose. Thus, this study aimed to identify and characterize COVID-19 related impacts on opioid overdose risk in emergency department (ED) patients with opioid use disorder focusing on social determinants of health, mental health and harm reduction.

Methods: Prospective study of ED patients age 18+ presenting to two urban EDs with non-fatal opioid overdose from October 2022-April 2024. Participants completed measures evaluating opioid use and overdose behaviors, life events, mental health and COVID-19 specific opioid behaviors. Measures were adapted from validated instruments or created de novo by the multidisciplinary study team. Demographic and clinical data were also collected.

Results: Of 165 patients screened, 10 were eligible for inclusion, provided informed consent and completed all survey instruments. Most patients were male (90%, n=9). Mean age of participants was 39.1 years (SD: 14.5). A majority of respondents reported using fentanyl prior to ED presentation (70%, n=7); several attributed the pandemic as the cause of fentanyl in their heroin (n=5). Overall, other than having access to/using naloxone, participant engagement with harm-reduction strategies was low with few patients participating in a buprenorphine/methadone program (n=4), taking a test shot (n=2), using in the presence of others (n=4), using a syringe exchange program (n=1) or utilizing fentanyl test strips (n=0). Most participants did not report pandemic-specific barriers to harm reduction resources. Participants reported pandemic-related impacts on several social determinants of health including employment (n=2), food insecurity (n=2) and difficulty filling prescriptions for medication (n=2). Several respondents reported feeling depressed or anxious (n=6); of those feeling depressed or anxious, a majority (n=4) attributed these feelings at least in part to the pandemic.

Conclusion: Fentanyl use was common in the study population and respondents felt the pandemic increased fentanyl prevalence in the illicit opioid supply. Participants-reported limited engagement with harm reduction strategies other than access to naloxone. Pandemic-related barriers to employment, nutrition and overall medication access were noted as well as increases in depression and anxiety. Future, larger prospective observational studies are needed to fully evaluate the role of these stressors on opioid overdose rates and opioid-related mortality and to devise patient-centered, targeted strategies to reduce overdose risk.

No, authors do not have interests to disclose

420 Practicing Clinician Ability in Estimating Patient Weight Using Visual Cues

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Background and Study Objectives: It can be challenging for healthcare providers to estimate patient weight prior to administering weight-based medications in an emergency setting. Recent public events where weight-based dosing errors have led to poor patient outcomes highlighted the need for training and assessment of personnel. Therefore, the goal of our study was to evaluate empirical weight and height estimation accuracy and to identify anthropometric variables used by healthcare professionals to understand their decision process.

Methods: In this study, two groups of people were involved, participants and volunteers. The participant group included a mix of emergency medical technicians (EMTs), paramedics, attending emergency physicians, resident family physicians, attending family medicine residency faculty, nurses, nurse practitioners, and physician assistants. The specific profession of these clinicians and years of experience in the position, were recorded. For the assessment, participants empirically estimated the height and weight of a group of 17 (10 male and 7 female) volunteers of various body habitus. Volunteers were pictured standing vertically next to a wall with a height cue as a reference. Their actual height and weight were recorded but not disclosed to participants until they had completed the assessment. Participants reviewed the photographed images in a slide presentation on a standardized computer setup and estimated the height and weight of volunteers. Participants then ranked which anthropometric features most heavily influenced their height and weight estimations in order from 1-10. These features included head size, neck size, upper extremity size, chest size, abdomen size, lower extremity size, height, estimated age, gender, and an option of "other" to clarify any variables they may have used that were not included. Height and weight estimated by participants was compared to the actual values and accuracy defined as the percentage of deviation accuracy from the actual value.

Results: A total of 75 participants were included in the study, attending emergency and family physicians, family medicine residents (32.0%), physician assistants (29.3%), EMTs and paramedics (33.3%), and nurses (4.0%). For height, the overall deviation accuracy was 0.47%±0.17 with 47 participants underestimating and 28 overestimating. No significant differences in the deviation accuracy by professional role were detected for height estimations (P=0.4817). For weight, the overall deviation accuracy was 4.98%±0.51 with 67 participants underestimating and 8 overestimating. There were significant differences in accuracy among the professional roles (P=0.0116). The most accurate groups estimating weight were EMTs and paramedics (-2.69%±0.60) while the least accurate were attending physicians and residents (-6.84%±0.62). The years of experience of the participant in their current position was not significant for either height or weight (P=0.2144 and P=0.5202 respectively). Height, followed by abdomen size and chest size were the most highly ranked physical features used in weight estimation.

Conclusions: This study identified variability across various healthcare roles in estimating weight but not height. Emergency medical services personnel appeared to perform with greatest accuracy. This research may be beneficial in educating clinicians on which anthropometric variables might be best used to estimate height and weight before dosing weight-based medications.

No, authors do not have interests to disclose

421 Unseen Flames in the Emergency Department: Patterns of Burn Injuries Resulting From Suspected Abuse

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Background: Both abuse and burn injuries are more prevalent among patients with low socioeconomic status. Among abuse presentations, burn injuries require special and early recognition for effective treatment and social intervention. Although the overall incidence of burn injury in the United States has decreased due to burn prevention efforts, up to 92% of burn injuries present to the emergency department (ED) as part of initial burn care and approximately 10% of pediatric burn injuries were inflicted by abuse. Therefore, recognizing burn patterns in cases of abuse will help emergency clinicians to identify high risk individuals in the ED.

Study Objectives: The objective of this study is to characterize patterns of abuse in burn injuries.

Methods: Burn encounters sustained with suspected abuse were isolated from the American Burn Association (ABA) Burn Care Quality Platform between January 2008 and December 2018. Descriptive statistics between cohorts with suspected abuse (SA) versus non-abuse mechanisms of injury (NA) were leveraged to summarize patient demographics, clinical characteristics, and patterns of burn injury.

Results: A total of 278,793 individuals sustained burn injury during the study period with 5,784 (2%) having a burn from SA. The highest prevalence of SA were among adults (31-64 years, 28%), followed by infants (0-4 years, 25 %), and young adults (19-30 years, 18%). The majority of the SA cohorts was composed of individuals who identified as males (61%), Black or African-American (44%), and who did not sustain an inhalation injury (91%). The predominant etiology of SA burns were: 1) scald (52%), flame (20%), and contact (8%) injuries. Median hospital length of stay among SA patients (6 days, interquartile range: 2-14 days) was significantly longer than NA patients (3 days, interquartile range: 1-10 days) (P<0.001). A high proportion (96%) of SA patients survived their burn injury and were discharged home (63%).

Conclusion: This study captures patterns of SA burn injury in a national cohort, demonstrating which populations are most vulnerable. Suspected abuse patients had significantly longer hospital lengths of stay, with the majority surviving their burns and being discharged home. Awareness of these patterns during initial presentation may help emergency clinicians recognize and care for high risk burn patients.

No, authors do not have interests to disclose

ALL RESEARCH EMBARGOED UNTIL DATE/TIME OF PRESENTATION

422 Lock-Downs Causing Lock-Ins: The Impact of the COVID Pandemic on Domestic and Intimate Partner Violence Trends Observed by Forensic Nurse Examiners

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Background: During the COVID-19 pandemic, worldwide upticks in patient volumes and trends in assault types and severity were observed by emergency departments (EDs), particularly the forensic nursing community, advocates, and community service providers. The University of Colorado Health's Forensic Nurse Examiner (FNE) Program at the University of Colorado Hospital (UCH) is no exception, as their specialized program of care for patients seen in the ED who are experiencing acute and long-term health consequences associated with violence reported being inundated with high volumes of severe cases of intimate partner violence, sexual assault, and physical assault cases.

Methods: To explore these trends quantitatively and how certain COVID-19 timepoints varied in their patient dynamics, this study consists of a secondary, longitudinal analysis of medical records pulled from the FNE program at the UCH ED between 2018-2022. Descriptive analyses and regression was used to analyze the number and severity of consultations performed by the FNE team at UCH during the COVID-19 pandemic.

Results: Patients in heterosexual relationships seen in the ED during/after the second lockdown (7/1/20 – 12/1/22) report higher Danger Assessment (DA) scores than those before COVID, however COVID timepoint did not predict changes in same-sex DA scores. COVID timepoint predicted the odds of a patient getting a FNE consult for sexual assault. Those who came to the ED during the first lockdown had a 48% lower odds of being consulted for Sexual Assault (SA). Those who came to the ED during the second lockdown had a 55% higher odds of being consulted for SA. Those who came to the ED after the second reopening (2021) had a 36% higher odds of being consulted for SA. COVID timepoint predicted the odds of a patient getting a FNE consult for drug-facilitated sexual assault (DFSA). Those who came to the ED during the first reopening (after the first lockdown) had a 18% higher odds of being consulted for DFSA. COVID timepoint also predicted the odds of a patient getting a FNE consultation for strangulation. There were no significant differences in the number of human trafficking FNE consults between COVID timepoints, however COVID timepoint did impact the odds of a patient getting a FNE consult for elder abuse.

Conclusion: This longitudinal analysis with a robust dataset over multiple timepoints has potential to not only inform what ED services are expected to be in demand during public health emergencies and lockdowns, but also contribute to scientific evidence around who is most affected or at risk for certain types of assault or violence in the region, help seeking behaviors, and trends over time.

No, authors do not have interests to disclose

423 WITHDRAWN

424 Emergency Department Visits for Pickleball Injuries From 2017-2022

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Background: Pickleball is currently the fastest growing sport in the United States. It is important to review injury patterns and mechanisms of pickleball injuries that present to United States emergency departments (EDs) to help guide players in preventative strategies to avoid future injuries.

Study Objectives: The objective of this study is to provide an updated analysis of pickleball related injuries treated in U.S. EDs.

Study Design: Descriptive Epidemiologic Study

Methods: This is a descriptive epidemiologic study using data from The National Electronic Injury Surveillance System of the U.S. Consumer Product Safety Commission. The data set was reviewed for pickleball related injuries that presented to United States EDs between 2017-2022.

Results: A total of 1,112 pickleball related injuries presented to approximately 100 U.S. EDs during the period of 2017-2022. Males made up 560 (50%) while females made up 552 (50%) of total injuries. Most injuries occurred in patients aged 61-80 years with a total of 805 injuries (72.4% of total injuries). Total number of injuries increased in the 51-60 age group as well as the 41-50 year age group from years 2020-2022. Most injuries occurred at "places of recreation/sports" with a total of 881 injuries (79.2%). Other areas where injuries occurred included at home, in a street, in "public places," or at school. The highest incidence of injuries involved upper trunk injuries (excluding shoulders) with a total of 141 (12.6% of total injuries). The next highest incidence of injuries involved the head with a total of 117 injuries (10.5% of total injuries) followed by the wrist with a total of 113 (10.2% of total injuries). The most prevalent injury types included strains/sprains as well as fractures alternating as the most common and second most common depending on the year. Notably, there was a decrease in sprains/strains as a percentage of total injuries from 32.6% in 2020 to 17.7% in 2022. Fractures made up a consistent 29% of the injuries over 2020-2022. Most of the patients were discharged after treatment or examination making up a total of 923 out of the total 1,112 patients. 165 patients were treated and admitted within the same facility, 2 patients were held for observation or admitted for observation, 2 patients eloped or left against medical advice, and 5 patients died.

Conclusions: This study focuses on how injuries presenting to emergency departments have evolved with the rapid growth and development of the sport of pickleball. The average annual number of injuries recorded within the six-year period of this study is 222, a significant increase from an annual average of just 18 injuries recorded from 2001-2017. There is a marked increase in injuries among younger players. In addition to the general increase in younger generations' participation in the sport, the rising number of injuries in younger players may be due to a difference in play technique when compared to older age groups. Pickleball is becoming more competitive with its own professional league, the Pro Pickleball Association. Elite competitors may be at increased risk of musculoskeletal injuries related to the sport. The current data points towards a surge in upper body and head injuries, suggesting potential shifts in the technical approaches to playing the sport. By monitoring trends, preventative strategies can be focused to avoid pickleball related emergencies.

No, authors do not have interests to disclose

425 Predictors of High-Risk Opioid Prescribing in the Emergency Department at an Academic Medical Center

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Study Objectives: According to the Centers for Disease Control and Prevention (CDC), 14.6% of adult emergency department (ED) visits require an opioid prescription. In 2016, the CDC published guidelines cautioning providers when prescribing ≥50 morphine milligram equivalent (MMEs) per day to reduce the risk of long-term opioid misuse, overdose, and death. While opioid use at discharge from the ED has been associated with long-term opioid misuse, few studies have investigated factors that predict high-dose prescribing in a clinical setting. This study aims to assess ED opioid prescribing and identify patient- and visit-level risk factors that predict prescribing ≥50 MMEs/day.

Methods: This was a retrospective cohort study at Loyola University Medical Center from January to June 2020, including patients ≥18 discharged from the ED with an opioid prescription. Patients receiving hospice care, hospital admissions, deceased within 24 hours of the ED visit, or transferred to an outside hospital were excluded. A multivariable logistic regression was conducted to identify risk factors for high-dose opioid prescriptions (≥50 MMEs/day). Candidate variables selected were based on previously described risk factors, including sex, age, prior history of opioid use or other substance use, psychiatric condition, chronic pain condition, and pain status. The primary outcome was the incidence of ED discharge with a prescription for ≥50 MMEs/day.

Results: Overall, 815 of 883 patients met inclusion criteria, with 23 prescribed ≥50 MMEs/day and 792 prescribed <50 MME/day. Ages ranged from 18 to 96, with a median age of 47, and comprised 55% of females. History of opioid use within 12 months was found in 29% of patients, while use of benzodiazepines was 13%. Notable comorbidities included chronic pain conditions (24%), psychiatric history (10%), and alcohol or substance use disorder (5%). Of the prescribed opioids, hydrocodone/acetaminophen was the most frequent, with an average prescribed dose of 20 MMEs/day and an average treatment duration of three days. The most common chief complaint was injury or burn-related at 29%, followed by abdominal pain at 17%. The

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incidence of opioid prescriptions exceeding ≥50 MMEs/day was found in 2.8% of cases. Subsequent hospital encounters were recorded for 380 patients, with seven visits related to opioid use. Multivariable logistic regression analysis revealed that a history of prior opioid use within 12 months was negatively associated with receiving an opioid prescription exceeding ≥50 MMEs/day (OR: -3.16, 95% Confidence Interval: -4.99 to -1.32). Other analyzed variables did not significantly predict opioid prescriptions exceeding ≥50 MMEs/day.

Conclusion: Few patients received an opioid prescription exceeding a dose of ≥50 MMEs/day upon ED discharge, suggesting an awareness of the risks of high-dose opioid prescribing driving opioid stewardship from ED providers. Additionally, a prior history of opioid use was negatively associated with opioid prescribing ≥50 MMEs/day, possibly due to concern for misuse potential.

No, authors do not have interests to disclose

426 Missed Diagnosis of Mild Traumatic Brain Injury: Retrospective Study in an Urban Emergency Department

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Study Objectives: Mild traumatic brain injuries (mTBI) – also called concussions, are a major public health issue that commonly present to the emergency department (ED). In 2014, the Center for Disease Control and Prevention (CDC) reported approximately 2.5 million traumatic brain injury-related ED visits, with the highest prevalence within the elderly (1,682.0 per 100,000), ages 0-4 (1,618.6 per 100,000), and ages 15-24 (1,010.1 per 100,000). We aim to characterize patients (aged 18+) presenting to an urban emergency department with mild head injury and determine the proportion of accurate identification or diagnosis.

Methods: Data was obtained from a retrospective study of ED patients with ICD10 codes consistent with mTBI or potential mechanisms of injury over one year (2018) at an urban, level one trauma center. Patients who presented with a traumatic mechanism, head injury, and at least one symptom of a concussion were included. The data was characterized by demographics, mechanism of injury, signs/symptoms of concussion, and presence/absence of likely concussion as determined by independent attending physician review.

Results: A total of 352 patients met criteria for likely concussion during a 12-month period (female, n=178, 50.57%; male, n=174, 49.43%). Most patients were aged 25-64 (n=244, 69.318%) with the >64 age group making up just 12.78% (n=45). The most common mechanisms of injury were assault (121, 34.38%), fall (n=118, 33.52%), and motor vehicle accident (n=89, 25.28%). Whereas sport related injury (n=2, 0.57%) were uncommon. Attending physician review of documentation showed there were 261 of 352 (74.14%) cases of potential mTBI which did not contain a diagnosis or documented medical decision making consistent with identification of concussion/mTBI. Secondary analysis showed the symptoms of "Nausea of Vomiting" (OR 0.3101, 95% CI [0.1376, 0.6991]) and "Retrograde Amnesia" (OR 0.3109, 95% CI [0.0996, 0.9454]) may be protective against a possible missed diagnosis.

Conclusion: Head injury management in the ED focuses on identifying immediate life-threatening injuries, with little emphasis on mTBI. This study demonstrates a significant proportion of mTBI/concussions were missed in an urban ED population, and most concussions were the result of assaults and falls, and within the ages 25-64, contrast to previous reports. Further investigation is needed to identify any further disparities.

No, authors do not have interests to disclose

427 Comparison of High and Low Dose Ketorolac With Placebo for Treatment of Pain in the Emergency Department: A Randomized Controlled Clinical Trial

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Study Objectives: Ketorolac is one of the most used medications in the emergency department (ED) for pain control. The optimal dose for pain control, however, remains unclear. Higher doses of ketorolac are associated with an increased risk for adverse events, which include upper gastrointestinal bleeding, prolonged bleeding time, and post operative hemorrhage. Recent studies have shown that lower doses of ketorolac have equivalent analgesic effects for pain control for patients in the ED. However, these trials did not include a placebo group when evaluating efficacy of pain control. This study evaluated the analgesic efficacy of ketorolac at both high and low doses compared to placebo. The efficacy of pain control was also evaluated for four different types of pain that commonly present to the ED.

Methods: This was a prospective double blind, randomized, placebo-controlled clinical trial. Patients presenting to the ED were screened for four different types of pain which included: (1) Headache (2) Musculoskeletal Pain (3) Abdominal Pain and (4) Viral Syndrome. Exclusion criteria were age < 18 y/o, pregnancy or lactation and any contraindication to ketorolac. Patients were randomized to receive either 30mg of ketorolac, 10mg of ketorolac, or placebo delivered through intravenous piggyback infusion over 15 minutes [GB1]. After thirty minutes, the patient's pain was re-evaluated using a Visual Analog Scale (VAS), and patients were assessed for any negative effects of treatment. Patients were also offered additional analgesia if needed at that time.

Results: A total of 288 patients were enrolled, and 253 completed the study. 83 patients received 30mg of ketorolac, 89 patients received 10 mg of ketorolac, and 81 patients received placebo. A total of 130 patients presented with abdominal pain, 20 patients presented with headache, 70 presented with musculoskeletal pain, and 34 presented with viral syndromes. For all groups, the median visual analog score changed by 16.7 in patients who received 30mg intravenous ketorolac, by 15.6 in patients who received 10mg of intravenous ketorolac, and by 14.3 in patients who received placebo (all treatments reduced pain at reevaluation, $p<0.0001$). Subgroup analysis of change in pain score based on the type of pain patients presented with shows a similar statistically significant reduction in pain score with both doses of ketorolac and with placebo. There were no serious adverse events with the administration of ketorolac.

Conclusion: Significant reductions in VAS pain scores were seen based on receiving 30mg intravenous ketorolac, 10mg intravenous ketorolac, or placebo. Reductions in VAS pain scores for intravenous ketorolac at either dose or placebo were also seen between all patient pain types. No differences among treatments alone were detected.

Table 6b. Change in VAS pain (mm) by Category and Study Group (updated)

		Change in Pain			
Category	Study_Group	N	Mean	Std Dev	P-value
Abdominal	A	47	22.1	21.2	
Abdominal	B	37	12.4	16.7	<.0001
Abdominal	C	46	19.4	20.1	
Headache	A	7	11.1	19.9	
Headache	B	9	13.3	15.7	0.0004
Headache	C	4	10.8	10.1	
Musculoskeletal	A	19	10.0	19.5	
Musculoskeletal	B	23	13.8	17.1	<.0001
Musculoskeletal	C	27	5.4	15.9	
Viral	A	10	8.4	16.6	
Viral	B	12	21.8	20.1	<.0001
Viral	C	12	25.4	18.3	

Group A - 30 mg ketorolac
Group B - Placebo
Group C - 10 mg ketorolac

No, authors do not have interests to disclose

428 Self-Reported Readiness to Change Alcohol Use in Emergency Department Patients With Alcohol Use Disorder Predicts Successful Linkage to Treatment

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Background: To guide an educational intervention focused on enhancing patient readiness to change among emergency department (ED) clinicians, we sought to identify the relationship between ED patient self-reported readiness to change alcohol use and treatment engagement within 30 days among ED patients receiving a Brief Intervention. Project ASSERT is a long-standing ED-based screening, brief intervention, and referral to treatment program for unhealthy alcohol and other drug use in this tertiary academic hospital.

Methods: We conducted a retrospective cross-sectional study evaluating all ED patients evaluated by Project ASSERT for moderate or severe alcohol use disorder (AUD) during 2022-2023. Descriptive statistics and ANOVA were used to evaluate readiness to change alcohol use (1 to 10 scale), direct (same day) versus indirect (treatment program information) referral for formal addiction treatment and treatment engagement within 30 days. Binary logistic regression adjusting for age, gender, race, ethnicity and insurance was used to evaluate the relationship between self-reported readiness to change and successful linkage to treatment linkage within 30 days.

Results: During 2022-2023, a total of 2,648 ED patient visits included a Brief Intervention by Project ASSERT, with 2,389 (90.2%) receiving either a direct (1,103; 42.4%) or indirect (1,376; 57.6%) referral. The mean readiness to change alcohol use score was highest among those who received a direct (M=8.32, SD=2.03) versus indirect referral (M=6.50, SD=3.17) and lowest among those who refused referral (M=5.14, SD=2.73; $p<0.001$). The odds of successful treatment linkage within 30 days increased by 15.7% for every single point increase on the readiness to change scale (AOR 1.157, 95% CI 1.093-1.22) when controlling for demographics and insurance status.

Conclusion: In this sample of ED patients with moderate or severe AUD, self-reported readiness to change alcohol use is a strong predictor of successful linkage to treatment within 30 days. Given the large morbidity and mortality associated with AUD and recognized gaps in treatment, strategies to increase ED patient readiness to change alcohol use should be widely disseminated.

No, authors do not have interests to disclose

429 Implementation of Patient Blood Management Program Improves Blood Product Utilization in the Emergency Department

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Study Objectives: Patient blood management (PBM) programs have demonstrated increased provider compliance with transfusion guidelines and improved patient clinical outcomes in the inpatient setting. There is a paucity of research describing implementation of PBM programs in the emergency department (ED). We sought to investigate whether system-wide implementation of a PBM program was associated with changes in emergency physician blood product transfusion decisions.

Methods: A quasi-experiment involving a retrospective review of pre-existing administrative data was performed. Blood product utilization was measured across a single public, non-profit healthcare system located in the Southeast United States. Three metrics were defined and used to evaluate physician red blood cell (RBC) transfusion decisions: 1) pre-transfusion hemoglobin (hb) < 7 grams/deciliter (g/dL), 2) pre-transfusion hb < 8 g/dL, and 3) single unit RBC ordering. Monthly metric compliance was measured and recorded for each of 5 ED entities over 24-month period (March 2019 – February 2021). A PBM program involving clinical and administrative infrastructure development, transfusion guidelines dissemination, provider-level metric performance reporting, and targeted education was implemented in February 2020. Compliance data was divided into pre (March 2019-February 2020) and post (March 2020-February 2021) cohorts. A pre-post analysis using paired t-tests to assess differences in metric compliance was performed using SAS v9.4 (SAS Institute Inc., Cary, NC). The level of significance was set at $p<0.05$ (two-sided) a priori.

Results: Mean compliance with metrics 1, 2, and 3 were 73%, 93%, and 40% and 76%, 94%, and 50% for pre and post groups, respectively. The difference in metric 1 compliance was 3.3% (95% CI: -0.4-7%), and this difference was not statistically significant ($p=0.07$). The difference in metric 2 compliance was 1.5% (95% CI: -0.5-3%), and this difference was not statistically significant ($p=0.13$). The difference in metric 3 compliance (single unit RBC ordering) was 9.8% (95% CI: 5-15%), and this difference was statistically significant ($p<0.001$).

Conclusion: Within the first 12 months following implementation of a system-wide ED PBM program, physician compliance with blood product transfusion guidelines improved. Future research investigating changes in clinical outcomes and the economic implications of such a program is warranted.

No, authors do not have interests to disclose

430 Decreasing Time to Initial Pain Intervention in the Pediatric Emergency Department

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Background: Timely initial pain intervention is essential to providing high quality, patient-centered care in the emergency department (ED). Only 32.3% of patients ages 10-17 presenting to our pediatric ED with pain received pain intervention within 1 hour of triage assessment, 39.3% received pain intervention in more than 1 hour, and 28.4% received no documented pain intervention prior to ED disposition. This quality improvement initiative aims to increase the percentage of patients who receive pain intervention within 1 hour of triage to 70% in children ages 10-17 years who present to our pediatric ED with pain by 8/1/2024.

Methods: A multidisciplinary team at an urban, academic, pediatric ED implemented interventions including physician and nurse education about analgesia, optimization of analgesic medications available in the Pyxis, and emphasis of non-pharmacologic interventions via a triage toolkit including an outline of age-appropriate distraction techniques and supplies.

Results: Preliminary results after these interventions show improvement in the percentage of patients with pain who receive intervention within 1 hour of triage (45.3%) and a decrease in the percentage of patients who did not receive any pain intervention prior to ED disposition (25.5%). Forthcoming interventions include development of a triage pain management algorithm, nursing-driven standing analgesic orders, and a pain treatment reminder within the electronic medical record. All patients ages 10-17 with an elevated pain score at triage were included unless they qualified for an alternate triage pathway or had an established pain protocol (ie, level trauma activations, critical medical alerts, patients with psychiatric complaints, and patients with sickle cell disease). All ED encounters were numerically ordered by medical record number and a random number generator was used to select 200 charts for analysis per month.

Conclusion: A balancing measure survey of physicians and nurses was conducted after each intervention and has demonstrated perceived improvement in patient/family satisfaction and neutral or positive impact on workflow. By 8/1/2024, all interventions are anticipated be in place to increase the percentage of patients ages 10-17 with an elevated triage pain score who receive pain intervention within 1 hour to 70%.

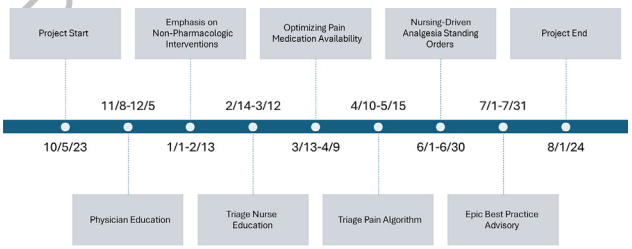

Figure 1. Project Timeline

No, authors do not have interests to disclose

431 Text Me Maybe: Using Text Messages to Improve Patient Experience in the Emergency Department

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Study Objectives: Emergency department (ED) care faces substantial obstacles including inpatient boarding, staffing shortages, and increasingly complex patient flow models. These challenges limit the transparency of a patient's ED visit, which can undermine the therapeutic alliance, lead to patients leaving without being seen (LWBS), and increase medicolegal risk. Though timeliness is one of the largest drivers of patient satisfaction, a singular focus on improving timeliness can reach diminishing returns in the face of external barriers. One method to improve patient satisfaction and care quality is leveraging technology such as text messages (or SMS)

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to provide patients with insight into their care and broader education on ED workflows. Over the course of this study, a pilot system for delivering de-identified information to patients via fully automated text messages was developed using existing electronic health record (EHR) functionality (Epic Systems, Verona, WI). The primary objective of this study was to understand whether patients who were enrolled in the SMS pilot were interested in receiving messages and, if so, what content was most valuable.

Methods: This was a cross-sectional study conducted at a single urban ED in a Level 1 trauma center in New England. The department has ~89,000 annual patient visits and a baseline rate of LWBS of 10.7%. Adult, English-speaking patients who self-presented to the ED were invited to enroll in the SMS program. Text messages were automatically generated by the EHR. Patients could receive up to 11 different messages. Those who enrolled and received at least two text messages were sent a link to a REDCap survey via SMS that solicited anonymous feedback. The survey asked whether users wanted to receive text messages in future visits and which types of messages might be most helpful, with both pre-defined answers and space for unstructured comments.

Results: 70 patients provided survey feedback and consented for their feedback to be used. Of these, 61 (87.1%) indicated that they want to receive text messages as part of an emergency department visit. 8 patients (11.4%) indicated they would not want to receive messages and 1 patient (1.4%) did not indicate a preference. For those patients who were interested in receiving text messages, the most common desired content was insight into pending tests/procedures, clarity on expected disposition, and notifications when a provider is looking for them. The two most common reasons cited for not wanting to receive text messages was the belief that text messages would not answer questions and privacy/security concerns. 15 patients offered unstructured survey feedback regarding desired content (21.4%). The primary themes identified were care timeline and treatment, feedback on overall message content, or feedback for staff.

Conclusion: Though limited, these preliminary results indicate that patients view SMS as an acceptable method for sharing updates in the ED and suggest what content is most valuable for patients. This builds on prior literature establishing the utility of text messages in other clinical settings and suggests three future directions. First, patient feedback will help drive further automated message development. Secondly, the SMS program will expand its scope of eligible enrollees, both in terms of language accessibility and clinical acuity. Finally, this program will stand to benefit from an impact analysis to better understand how receiving SMS affects patient satisfaction as well as key operational metrics such as LWBS. In summary, this study established patient interest and feasibility in receiving text messages as a method for augmenting existing ED care.

Table 1. Text Message Content and Triggers

Trigger	Message Content
Enrollment in SMS Pilot	Thank you for visiting the Emergency Department. Throughout your stay, you may receive updates on the status of your care. Do not reply to this number.
Enrollment in SMS Pilot	Our goal is to make sure that you are well informed during your visit. For more information about what to expect during your visit, please visit this page: {ED Overview Link}
No logged vitals for 4 hours	Update: Thank you for waiting. As a standard safety precaution, we would like to recheck your vital signs. Please return to the round desk.
After the 1st call out from triage	We tried to call your name to be seen by a healthcare team member but were not able to find you. Please return to the Emergency Department.
Discharge disposition selected	Your care team will come in shortly to discuss your discharge and answer any of your questions.
Regular diet order placed	Your care team has cleared you to eat and drink if you wish.
NPO order placed	Due to your treatment plan, please refrain from eating or drinking unless a member of the care team instructs you otherwise.
ED room assignment	You have been assigned a treatment space. Having support can be important for healing. Please see our visitation policy here: {ED Visitation Policy Link} & ask your care team if visitors can join you.
Admit from ED (bed request)	You have been admitted to the hospital and are awaiting a room assignment. If possible, please send valuables home. Speak with your team if you need assistance.
Inpatient room assignment	You now have a room assignment for your hospital admission. If your friends or family have questions, our general patient information line is 401-444-5421.
Discharge from ED or admission	Thank you for enrolling in our text message program. We value your feedback and want to continue to improve this service. Please take 1-2 minutes to fill out an anonymous survey about text messages during your Emergency Department visit. {REDCap Survey Link}

No, authors do not have interests to disclose

432 Pneumococcal Urinary Antigen Testing in Community Acquired Pneumonia: A Missed Opportunity for Early Antibiotic De-Escalation or a Low-Value Test?

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Study Objectives: Current ATS/IDSA guidelines recommend against routine use of pneumococcal urinary antigen testing (pUAT) for patients admitted with community-acquired pneumonia (CAP), citing small randomized trials that have failed to demonstrate outcome related benefits. However, limited data exist on the impact of pUATs on antimicrobial de-escalation and patient outcomes. The aim of our study was to determine whether de-escalation of broad-spectrum antibiotics following a positive pUAT was associated with adverse clinical outcomes.

Methods: We conducted a retrospective cohort study of adult patients admitted with CAP between 2010-2019 to a large academic health system covering Ohio and Florida. For patients with multiple admissions, we selected the first within the study period. Patients who received a PUAT within 48 hours of admission were included. Antibiotic de-escalation was defined as narrowing therapy to a single agent with activity against *S. pneumoniae* without broad-spectrum activity against MRSA or *P. aeruginosa* within 48 hours of receiving pUAT results. We evaluated whether antibiotic de-escalation following a positive pUAT was associated with adverse clinical outcomes, specifically in-hospital length of stay and a composite clinical deterioration outcome of late ICU admission, late mechanical ventilation, and 30-day mortality. We performed multivariable linear regression on length of stay and binary logistic regression on composite clinical deterioration controlling for CURB-65 score, age, history of chronic lung disease, pneumococcal vaccination, diagnosis of sepsis, mechanical ventilation use, and vasopressor use on day 1.

Results: Of the 18,265 patients who underwent pUAT on admission, 383 (2.1%) had a positive result. Of those, 187 (48.8%) were de-escalated and 196 (51.2%) were not de- escalated. De-escalated patients had similar demographics and CURB-65 scores compared to those who were not de-escalated, but were less likely to have a history of chronic lung disease or require mechanical ventilation on day 1, and were more likely to have received a pneumococcal vaccination (Table 1). De-escalation was significantly associated with decreased LOS (mean difference 1.91 days, 95% CI: 0.72-3.10, p=0.002), even after adjusting for confounders (1.18 days, 95% CI: 0.094-2.26, p=0.034). De-escalation was also associated with lower odds of composite deterioration (OR 0.50, 95% CI: 0.28-0.88, p=0.012) but this did not remain significant after controlling for confounders (OR 0.61, 95% CI: 0.33-1.11, p=0.107). In the de-escalated group, only 1 out of 20 (5%) tested had a positive *C. difficile* test within 30 days, compared to 8 out of 47 (17%) patients in the non-de-escalated group.

Conclusion: In patients with CAP and positive pUAT, antibiotic de-escalation was associated with a significantly shorter hospital stay. De-escalation was not associated with a worse composite clinical outcome and appears to be safe.

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	De-escalated (N=187)	Not De-escalated (N=196)	P-value
Age (years)			
Mean (SD)	67.6 (15.8)	64.6 (15.7)	0.0661
Median [Min, Max]	66.6 [24.8, 101]	65.5 [19.1, 95.4]	
Sex			
Male	84 (44.9%)	87 (44.4%)	0.999
Female	103 (55.1%)	109 (55.6%)	
Race			
White	101 (54.0%)	126 (64.3%)	0.234
Black	71 (38.0%)	59 (30.1%)	
Other	11 (5.9%)	8 (4.1%)	
Unknown	4 (2.1%)	3 (1.5%)	
Body Mass Index (BMI) (kg/m^2)			
Mean (SD)	27.2 (7.70)	27.1 (7.70)	0.817
Median [Min, Max]	25.7 [13.5, 54.0]	25.8 [14.9, 68.6]	
Current Smoker			
No	127 (67.9%)	148 (75.5%)	0.124
Yes	60 (32.1%)	48 (24.5%)	
Any Pneumonia Vaccine (PCV13, PPSV23, PCV7, PCV10, or unspecified)			
No	60 (32.1%)	85 (43.4%)	0.03
Yes	127 (67.9%)	111 (56.6%)	
Any Chronic Lung Disease			
No	55 (29.4%)	88 (44.9%)	0.00248
Yes	132 (70.6%)	108 (55.1%)	
Any Immunodeficiency (incl. HIV/AIDS)			
No	152 (81.3%)	151 (77.0%)	0.371
Yes	35 (18.7%)	45 (23.0%)	
Sepsis			
No	129 (69.0%)	110 (56.1%)	0.0127
Yes	58 (31.0%)	86 (43.9%)	
Invasive Mechanical Ventilation on Day 1			
No	169 (90.4%)	152 (77.6%)	0.00109
Yes	18 (9.6%)	44 (22.4%)	
ICU Admission on Day 1			
No	94 (50.3%)	96 (49.0%)	0.881
Yes	93 (49.7%)	100 (51.0%)	
Vasopressors on Day 1			
No	169 (90.4%)	149 (76.0%)	<0.001
Yes	18 (9.6%)	47 (24.0%)	
Intravenous Antibiotics in Prior 3 Months			
No	128 (68.4%)	128 (65.3%)	0.586
Yes	59 (31.6%)	68 (34.7%)	
Pneumococcal Pneumonia in Prior 3 Months			
No	179 (95.7%)	185 (94.4%)	0.715
Yes	8 (4.3%)	11 (5.6%)	
CURB-65 Score			
Mean (SD)	2.68 (1.21)	2.57 (1.23)	0.343
Median [Min, Max]	3.00 [0, 5.00]	3.00 [0, 5.00]	

Table 1. Demographics and clinical characteristics by de-escalation cohort.

No, authors do not have interests to disclose

433 Continuous Quality Improvement for Prehospital STEMI Results in Shorter Door to Balloon Times and Optimized Triage Rates

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Background and Study Objectives: Mission Lifeline EMS recognition is a program designed to showcase Emergency Medical Service (EMS) organizations nationwide for excellent STEMI care. Prehospital personnel are the first providers of care to patients suffering from cardiac emergencies. The role of EMS in the system of care for these patients is crucial and often sets the course for the patient's outcome. Decreasing the door-to-balloon time means more rapid reperfusion and improved morbidity and mortality for the patient.

Methods: Our county EMS quality improvement system implemented the Mission Lifeline program by developing the following protocol for chest pain in patients over age 35: 1) 12 lead EKG; 2) Pre-activation if EKG suggestive of STEMI; 3) Transparent, timely feedback to EMS and hospital personnel; 4) Monthly QA meetings posting each hospital's statistics and sharing best practices; 5) Bypassing of hospitals that did not share in transparent feedback process or did not meet door-to-balloon goal times. Data on demographics, hospital details, and door-to-balloon times were collected quarterly as part of our EMS agency's robust IRB-approved research registry.

Results: The percentage of patients who met the EMS to balloon time of 90 minutes steadily increased over the 4 years since protocol inception. Year 1-74% (n=142) Year 2- 70% (n=165) Year 3- 80% (n=167) Year 4- 88% (n=116) The improvement over time was statistically significant, p= 0.0314 (z-test for proportions). The percentage of cases under-triaged (STEMI not recognized when present) and over-triaged (called a STEMI but was not one) also improved. In Year 3, 4% of cases were undertriaged and 10% over triaged. In Year 4, these numbers improved to 2% and 6% respectively.

Conclusion: Achieving optimal door to balloon times in STEMI is an achievable goal, with the process starting in the prehospital arena. While EMS cannot directly control the quality of care delivered at a given hospital, they can hold hospitals accountable for suboptimal door-to-balloon times, and thus influence patient outcomes. Creation of a prehospital QI registry can be helpful to track outcomes in real-time, and keep the focus on patient-centered metrics.

No, authors do not have interests to disclose

434 The Safety and Efficacy of Intranasal Fentanyl and Midazolam for Pediatric Anxiolysis

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Background and Study Objectives: Procedures with pediatric patients in the emergency department (ED) can be difficult, partly due to the anxiety that this can invoke in the pediatric population. Unmanaged anxiety can have a lasting impact on children's attitude toward healthcare. A pediatric patient's significant anxiety around a procedure has the potential to prolong the experience and make it more difficult for the healthcare provider to perform the task. Intranasal (IN) fentanyl and midazolam have been found to be safe and effective medications to achieve anxiolysis in the pediatric population. Few studies have examined the safety of implementation of a protocol in a mixed pediatric and adult population emergency department. We have conducted a small quality improvement (QI) project aimed at improving the pediatric patient's experience in the ED through implementation of an anxiolysis protocol. The objective for the project is to demonstrate that these protocols can be safely and easily implemented in a mixed adult and pediatric emergency department.

Methods: The protocol for IN fentanyl and midazolam was implemented within a mixed population, adult and pediatric ED. Prior to use of this protocol, these medications were used in isolation or in tandem and were considered a procedural sedation. The protocol allowed for the use of 0.2mg/kg of midazolam and 2mcg/kg of fentanyl administered IN to achieve anxiolysis of pediatric patients. 75 patient encounters utilized the protocol. Patients were excluded if analgesics other than NSAIDs were used during the ED visit. After the procedure, the ordering provider was asked to score the level of sedation achieved utilizing the Ramsay Sedation Scale (RSS) and to report adverse outcomes. Given that this QI project collected ordinal data without a group to compare to, data analysis was focused on determining the variability and central tendency of the RSS achieved. The median RSS as well as the first quartile (Q1), third quartile (Q3), and interquartile range (IQR) were then calculated to determine the central tendency of the data.

Results: In total 75 encounters utilized the IN fentanyl and midazolam protocol. There were no reported adverse outcomes. Of those 75 encounters, 52 found the use of the protocol to be sufficient in achieving anxiolysis with a RSS that was 2 or greater. 23 encounters placed the patient at a 1 on the RSS indicating ineffective anxiolysis. The median reported RSS was 2. Quartile 1 and quartile 3 were 1 and 3 respectively. The interquartile range was calculated to be 2.

Conclusion: The data from this QI project indicates that this is a safe protocol to implement within a mixed, adult and pediatric population ED. In the small group there were no reported adverse outcomes. The median RSS of 2 as well as the narrow IQR indicates that the tendency was for IN anxiolysis to achieve a satisfactory level of anxiolysis without over sedation. We provide strong evidence that the use of IN fentanyl and midazolam is a safe and effective protocol that can easily be implemented within mixed adult and pediatric, community emergency departments. Implementation of this protocol can drastically improve the experiences of pediatric patients within the emergency room.

No, authors do not have interests to disclose

435 Assessing the MIAHTAPS Protocol for Workplace Violence Prevention in Emergency Care

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Background: Workplace violence (WPV) remains a persistent issue in emergency departments (EDs) nationally, including at the Covenant Emergency Care Center (ECC) in Saginaw, Michigan, where 68 violent assaults on staff were recorded from

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January to September 2021. A preliminary retrospective chart review revealed that these assaults occurred within the first hour of patient admission, with most of these patients presenting for mental health evaluations (MHE).

Study Objective: This quality improvement project's objective was to implement and analyze a risk assessment tool as an intervention for the early identification of high-risk individuals for WPV.

Methods: Based on expert recommendations and preliminary data at Covenant ECC, the MIAHTAPS risk assessment tool was introduced for evaluation. Nursing staff used the tool in their initial assessment of all patients seen for mental health evaluation (MHE) to record individual numerical scores in 7 different categories, including Altered Mental Status, Irritable, Agitated, History of Violence, Threating Verbal/Physical, Attacking Objects, Pacing and/or Staring, as well as a cumulative score. Elevated scores prompted actions based on the severity, including de-escalation, alerting the physician, and timed reassessments. The instances of WPV were collected from security records and compared in the pre-intervention phase (January 1, 2021, to September 31, 2021) versus the post-intervention phase (September 1, 2022, to February 28, 2023). We then performed a retrospective chart review of all assaults recorded as recorded by security and used data from the electronic medical record to quantify the usage rates of the MIATAHPS scale.

Results: In the pre-intervention period, 68 assaults occurred over 9 months, with an average of 7.56 assaults/month. In comparison, the post-intervention period saw 49 assaults over 6 months, with an average of 8.17 assaults/month, with no statistically significant increase in assaults (p=0.41). In the pre-intervention phase, we saw 322 consults/month compared to the post-intervention phase seeing 340 consults/month, with no statistical difference between the two (p = 0.35). Over the 6-month period, we saw increased utilization of the MIAHTAPS scale for chief complaints of "mental health evaluation." Of the 2,044 crisis consultations, there were 814 MIAHTAPS scales completed (40%). However, MIAHTAPS was used 69% of the time in assaults with 52% of those occurring prior to the assault.

Conclusions: Despite the implementation of the MIAHTAPS risk assessment tool, there was no significant reduction in violent episodes in the ED, consistent with unchanged monthly mental health evaluation-related complaints. While the tool did not notably decrease workplace violence, it was actively used, particularly with patients showing violent behavior. This suggests proactive use by ED staff and underscores the tool's potential for greater effectiveness with further adjustments and ongoing dedication to its application.

Significance: The challenges highlighted by the MIAHTAPS tool's limited success underscore the need for alternative strategies in violence prevention within emergency care settings. Possible approaches could include the establishment of dedicated spaces for psychiatric evaluations, isolated from the ED's hectic environment, with specialized staff trained for early intervention. This model, inspired by successful practices elsewhere, may offer a more controlled setting that facilitates better management of at-risk patients and enhances safety for ED personnel.

No, authors do not have interests to disclose

436 Combination Rapid- and Long-Acting Subcutaneous Insulin for the Management of Mild to Moderate Diabetic Ketoacidosis

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Study Objectives: Recent studies have demonstrated rapid-acting subcutaneous (SQ) insulin regimens to be safe and effective in the management of diabetic ketoacidosis (DKA). However, the need to administer them every 1–2 hours imposes a significant nursing burden. Co-administration of long-acting SQ insulin upon therapy initiation may minimize the number of rapid-acting insulin injections through providing sustained insulin concentrations and mimicking the effects of a continuous intravenous (IV) insulin infusion. However, this approach has not been extensively evaluated. Therefore, the purpose of this study is to evaluate the safety and efficacy of combining rapid- and long-acting insulin in the management of mild to moderate DKA.

Methods: This is an ongoing retrospective study including adult, non-pregnant patients who presented with uncomplicated mild to moderate DKA (serum bicarbonate $\geq$ 10 mmol and pH $>$ 7.0) and received either the SQ or IV insulin order set. The primary efficacy outcome was the number of individuals whose DKA resolved within 12 hours (glucose $<$ 200 mg/dL and two of the following: pH $>$ 7.3, bicarbonate $\geq$ 15 mmol/L, or anion gap $<$ 12). Secondary efficacy outcomes included the time to DKA resolution and hospital length of stay. The primary safety endpoints included the number of individuals who became hypoglycemic (glucose $<$ 70 mg/dL) or hypokalemic (serum potassium $<$ 3.3 mmol/L). Patients ordered the SQ order set received a single dose of glargine (0.2 units/kg) and lispro (0.2 units/kg) upon therapy initiation, followed by lispro (0.2 units/kg) every three hours. Once the glucose was $<$ 250 mg/dL a dextrose 5% - 0.45% NaCl solution was initiated and the lispro dose was reduced to 0.1 units/kg, but continued to be administered every three hours until DKA resolution. Patients ordered the IV order set received an insulin infusion that was titrated per institutional protocol until DKA resolution. Glucose, electrolytes, and venous blood gases were checked every three hours in the SQ order set. Glucose was checked hourly, whereas electrolytes and venous blood gases were checked every two hours in the IV order set. The SQ order set did not replace the institution's IV insulin order set and prescribers could order either one at their discretion, but the SQ order set could only be ordered for patients admitted to the emergency department Observation Unit.

Results: Preliminary data analysis included 33 patients in each treatment arm. There were no statistically significant differences between the two groups in their baseline characteristics or laboratory values. The number of patients whose DKA resolved within 12 hours in the IV and SQ groups were 27 (81.8%) and 30 (90.9%), respectively (p=0.475). The median time to DKA resolution in the IV and SQ groups was 5.53 hours (4.1-10.6) and 5.8 hours (3.0-7.9), respectively (p=0.168). Patients received the IV order set for a median duration of 12.0 (7.1-16.8) hours. The hospital length of stay was significantly shorter in the SQ group compared to the IV group (18.6 hours vs 62.3 hours, respectively, p$<$0.001). There were no significant differences between the SQ and IV groups in the number of patients who experienced hypoglycemia (2 vs 2, respectively) or hypokalemia (1 vs 3, respectively).

Conclusions: Preliminary results indicate that combining rapid- and long-acting SQ insulin is not only as safe and effective as IV insulin infusions in the management of uncomplicated mild to moderate DKA, but is associated with significantly shorter hospital lengths of stay.

No, authors do not have interests to disclose

437 Use of a Sepsis Prediction Model to Augment Acuity Assignment and Improve Triage Process

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Study Objectives: With high rates of emergency department (ED) utilization and boarding, patients often experience prolonged wait times. EDs have begun to implement provider in triage (PIT) systems, which facilitate early evaluation of patients and initiation of labs, imaging, and treatment before ED room assignment. However, test results from early workups are rarely incorporated in prioritizing room assignment for patients in the waiting room. Our health system previously deployed an electronic health record (EHR)-integrated predictive model to identify patients at risk for sepsis. We sought to assess the utility of complementing the Emergency Severity Index (ESI) with this predictive model to help augment our triage process in identifying patients most in need of an ED bed.

Methods: In this cross-sectional study we evaluated all patients who were admitted or discharged from an academic ED between December 2023 to April 2024. Using Epic's Clarity reporting database (Epic Systems Co., Verona, WI), we extracted encounter level data for all patients meeting the inclusion criteria including ESI, Early Detection of Sepsis Score (EDSS; v1.0), ED disposition, and ED throughput metrics. The EDSS is generated from an EHR-derived penalized regression model which runs every 15 minutes for each ED patient. The model includes age, demographics, comorbidities, vitals, lab results, and medications. We derived aggregate measures of the patient's EDSS including: first score, last score, median score, maximum score, maximum change in score, and maximum score during the prior two hours. We fit a multivariable binary logistic regression model evaluating the association of EDSS and ESI with the patient's final ED disposition to predict patient admission. We evaluated model performance with a likelihood ratio chi^2 test (LR) and its associated C-statistic. We represent the effect of individual predictive variables by providing associated odds ratios. We also performed analysis of variance (ANOVA) testing to assess the proportion of variance explained by each variable.

Results: We included 15,072 patients in this study. ESI distribution consisted of 1.72% Level 1, 48.12% Level 2, 43.65% Level 3, 6.22% Level 4, and 0.29% Level 5 patients. The median EDSS was 1.19 (Interquartile range or IQR 0.77-1.88). We chose to develop our final model using patients 5-hours after arrival to allow enough time for EDSS to be influenced by lab work from PIT system. We also chose to

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exclude ESI Level 1 and 5 patients from our final model due to inadequate sample size for patients at 5-hours. The ESI distribution for our final sample size for development included 499 ESI Level 2, 624 ESI Level 3, and 32 ESI Level 4 patients. Our model for ESI Level 2-4 patients 5-hours after arrival including ESI, first score, last score, median score, maximum score, maximum change in score, and maximum score during the prior two hours as predictors was significant (LR = 112.64, p<0.0001). The model's C-statistic was 0.696. Odds ratios (OR) for predictive variables are shown in Figure 1. Maximum score in the prior two hours had the highest OR at 2.66 (Confidence Interval or CI 1.61-4.39). ESI Level 2 had the next highest OR at 2.27 (CI 1.76-2.93). Maximum change in score had an OR of 1.68 (CI 1.05-2.68). First score had an OR of 1.25 (CI 1.02-1.54). Median score had an OR of 1.09 (CI 0.87-1.35). Maximum score had an OR of 0.51. Last score had an OR of 0.50 (CI 0.34-0.73). ESI Level 4 had an OR of 0.10 (CI 0.01-0.73). ANOVA testing, seen in the Figure, identified ESI, maximum score in the previous two hours, last score, first score, and maximum change in score as the most important variables (p<0.05).

Conclusion: We derived a model that can augment our current triage process using the ESI and a commonly available EHR-derived predictive model. While the diagnostic information added by the EDSS is modest, our utilization of it provides a much more objective mechanism to identify patients needing an ED bed. This process could include other models to provide more information at the point care for decision making.

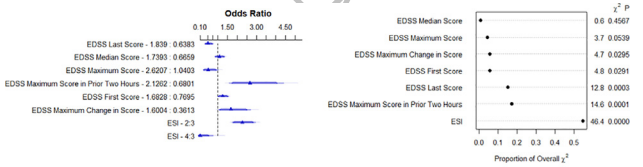

Figure 1: Evaluation of model performance for ESI Level 2-4 patients 5-hours after admission including odds ratios (OR) for predictive variables (*Left*) and ANOVA testing to assess the proportion of variance explained by each variable (*Right*).

No, authors do not have interests to disclose

438 Identifying and Addressing Health Care Barriers for Frequent Emergency Department Visitors

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Study Objectives: High utilizers, or "Most Visited Patients" (MVPs), make up a small proportion of the total number of emergency department (ED) patients (5-8%); however, they constitute a disproportionate percentage of annual ED visits (21-28%). Many of these visits are for chronic care management or non-urgent, low-acuity complaints. The average cost of treating common primary care conditions at a hospital ED is 12 times higher than visiting a primary physician's outpatient office, contributing an estimated $65 billion to rising health care costs. We implemented a "Plan-Do-Study-Act" quality improvement (QI) initiative to identify and address the root causes of MVP recidivism in our urban, academic ED. This analysis reports our initial findings and actions.

Methods: The QI initiative focused on patients enrolled in a county-provided medical assistance program serving uninsured residents with incomes at or below 200% of the Federal Poverty Level. MVPs were defined as patients who visited our ED three or more times within 90 days. After obtaining verbal consent, interviews with the MVPs were conducted using a 14-question standardized questionnaire. This survey explored social and medical factors impacting frequent ED use and barriers to accessing primary care.

Results: To date, 53 MVPs have participated in the survey. The most prevalent reasons for MVPs' repeated ED visits were pain/discomfort (51.6%), prescription refills (14.5%), and substance use (12.9%). Housing instability was common, with only 39.9% reporting stable residence. While 72% of MVPs reported understanding discharge plans, barriers like financial strain (18.6%), lack of transportation (13.6%), and homelessness (8.5%) hindered adherence. Most MVPs (57.7%) were unaware of their Primary Care Clinic (PCC). Additional challenges in accessing primary care included transportation difficulties (21.4%), unfamiliarity with public transportation routes (10%), limited phone access (5.7%), and uncertainty about scheduling appointments (5.7%).

Conclusion: The first phase of this QI initiative revealed 1- the main reasons for repeated ED visits, 2- the significant barriers MVPs face in accessing appropriate health care services, and 3- the urgent need for targeted interventions to improve patient care quality and reduce health care costs. The PDSA cycle analysis was instrumental in identifying and implementing targeted interventions to educate and enhance the quality of care for MVPs. Following the initial study, two changes have been implemented to bridge the gap between patient knowledge and available resources. To address the lack of awareness about PCCs, we have provided MVPs with verbal explanations and handouts about medical homes. This handout includes information on over 20 primary care clinics that accept the county assistance program and offer urgent clinic care. To assist with prescription refills, we provided MVPs with more information about our hospital's outpatient pharmacy, including our meds-to-bed program, operating hours, and a user-friendly map. The next phase of our initiative aims to explore the incorporation of cab vouchers into the hospital system to enhance continuity of care. These efforts are all designed to reduce health care disparities and improve outcomes for MVPs in our ED.

No, authors do not have interests to disclose

439 Using Failure Mode and Effect Analysis to Improve Time to Antibiotics in Febrile Pediatric Oncology Patients Presenting to the Pediatric Emergency Department

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Study Objective: The generally accepted goal for time to antibiotics (TTA) in oncology patients with fever presenting to the pediatric emergency department (PED) is 60 minutes due to their increased risk of bacterial infection. In 2016, we developed a new practice in our PED known as "Code Onc" to streamline the process for administration of intravenous (IV) antibiotics in this patient population. This led to a significant improvement in antibiotic administration time which was sustained for a few years. However, in 2022 we noticed our mean TTA had increased. Our Code Onc process was not working and we needed to improve it. The aim of our project was to decrease the mean TTA administration in oncology patients presenting to the PED with fever by 50% by March 2024 (13-month period).

Methods: A multi-disciplinary group met to perform a failure mode and effects analysis (FMEA) of the Code Onc process. A flow chart was created to review the initial Code Onc process from patient entry into the PED to administration of IV antibiotics. Failure modes were identified, and a risk profile number (RPN) was calculated for each one. The failure modes with the three highest RPNs were identified and we focused on improving these areas. All staff were educated on these changes at meetings and via emails, as well as in person education for nursing. Emails were also sent out after each patient encounter to the nursing and physician staff who cared for the patient, informing them of the TTA for the patient, whether it met our goal or not, and asking them to report back with any obvious barriers to obtaining this goal in the patient. On January 30, 2023, the new Code Onc was initiated. TTA for each individual encounter was tracked in a control chart. Data was collected from 1/30/23 – 2/29/24. For comparison, data from 8/1/22– 1/29/23 was used as our baseline data.

Results: The three failure modes identified as having the highest RPN were lack of room availability (RPN 256), delay in pharmacy preparation of antibiotic (RPN 144), and delay in CVL access by nursing (RPN 96) (Figure). New processes were developed to decrease the likelihood of these failures. These included identifying a designated space for Code Onc evaluation if no room immediately available, improved communication with pharmacy regarding the presence of Code Onc patients to prioritize their antibiotics, and education to nursing regarding the importance of time in this process. In the 6-month period prior to the implementation of the new process developed from the FMEA, the mean time to antibiotics (TTA) was 78 minutes with 26% of patients receiving IV antibiotics in less than 60 minutes. Post implementation of the new process the mean TTA was 55 minutes with 69% of patients receiving IV antibiotics in < 60 minutes. This led to two centerline shifts down in the desired direction on our control chart.

Conclusion: Given our significant improvement in TTA in pediatric oncology patients with fever during our initial Code Onc implementation, we were confident our process could work if we identified its inefficiencies. By performing an FMEA on the initial process we were able to pinpoint our failure modes with the highest RPN and focus our improvements there. In doing so, we saw significant improvement in our efficiency which has been sustained for 13 months. By improving our TTA, we are hopefully decreasing morbidity and mortality associated with bacteremia in this patient population.

Failure Mode and Effects Analysis - Code Onc								
Steps in Process	Failure Mode	Failure Causes	Failure Effects	Likelihood of Occurrence (1_10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Profile Number (RPN)	Actions to Reduce Occurrence of Failure
1	Patient identification	History of oncologic process not properly idenitfied on arrival	Patient not flagged as Code Onc	2	3	10	60	
2	Room availability	No room immediately available	Patient not evaluated in timely fashion	8	4	8	256	Use of room 26 if no regular patient room immediately available
3	Rapid physician evaluation	Physician not immediately aware of patient	Delay in patient evaluation and ordering of antibiotics	1	4	4	16	
4	Topical anesthetic application	Not applied at home or immediately on arrival to PED	Delay in access of CVL	4	2	5	40	
5	Antibiotic Ordering	Not ordered immediately after evaluation	Delay in preparation and administration	2	3	4	24	
6	Antbiotic preparation	Pharmacy not aware order is for Code Onc patient	Antibiotic preparation is not expedited over other patients' orders	4	6	6	144	Direct notification of pharmacy by physician via spectra link call or in person
7	Rapid access of patient's CVL	Lack of awareness of urgency of access	Delay in CVL access leads to delay in antibiotic administration	6	2	8	96	Direct education to nursing staff

No, authors do not have interests to disclose

440 Impact of Emergency Department Crowding on the Occurrence of In-Hospital Cardiac Arrest: A Propensity Score Matched Study

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Study Objectives: In this study, we aimed to determine whether emergency department (ED) overcrowding affects the occurrence of in-hospital cardiac arrest (IHCA) requiring resuscitation in the ED. To prove this hypothesis, we employed the Propensity Score (PS) matching method to adjust for clinical differences in patients according to the degree of ED overcrowding.

Methods: This was a retrospective observational study carried out in the ED of a 2,000-bed tertiary hospital in a South Korean city, which receives 90,000 to 100,000 visits annually. The indicators of overcrowding in the ED were defined as the total number of patients, the number of patients undergoing treatment, and the number of boarding patients awaiting hospital admission at the time of a patient's arrival. We defined the existence of ED overcrowding based on the 75%, 80%, and 90% thresholds of each indicator and conducted repeated experiments accordingly. We applied the PS matching method to adjust for clinical characteristic differences in patients who visited the ED during overcrowding situations. The overcrowding group and the non-overcrowding group were divided based on nine overcrowding indicators, and from these full study cohorts, nine PS-matched cohorts were derived through 1:1 PS matching (Figure 1). IHCA was defined as sudden cardiac arrest requiring cardiopulmonary resuscitation during an ED stay.

Results: 153,353 patients were included in the study, and 160 cases of IHCA occurred, showing an incidence rate of 0.10%. The Table compares the incidence rates of IHCA between the overcrowding group and the non-overcrowding group in the full study cohort and the PS-matched cohort. In the overcrowding group, defined by the total number of patients, the incidence of IHCA was higher, being 0.12% at the third quartile threshold, 0.14% at the 80% threshold, and 0.15% at the 90% threshold. When based on the number of boarding patients, the incidence of IHCA was higher, at 0.13% for the third quartile threshold, and 0.15% and 0.17% respectively for the 80% and 90% thresholds. In the comparison conducted after propensity score matching, the incidence of IHCA was statistically significantly higher in the overcrowding group, indicated by 80% boarding patients (0.15% vs 0.08%, p-value 0.0222). Figure 2 shows odds ratio for occurrence of IHCA in the full study cohort and the PS-matched cohort. Both the full study cohort and the PS-matched cohort showed a tendency to increase the occurrence of IHCA in an overcrowding situation with a large number of total patients and boarding patients. However, when the number of treating patients was used as the overcrowding indicator, overcrowding was not a factor that increased IHCA.

Conclusion: In this study, we confirmed that ED overcrowding increases the occurrence of IHCA requiring resuscitation in the ED. Particularly, the finding that access block negatively impacts the occurrence of IHCA highlights the critical importance of maintaining patient flow in the ED for patient safety. Therefore, to avoid the risk of IHCA caused by ED overcrowding, it is imperative that hospital-wide efforts are made to ensure that the patient outflow from the ED is not obstructed.

Figure 1. Flowchart of study participants in the full study cohort and the propensity score-matched (PS-matched) cohort

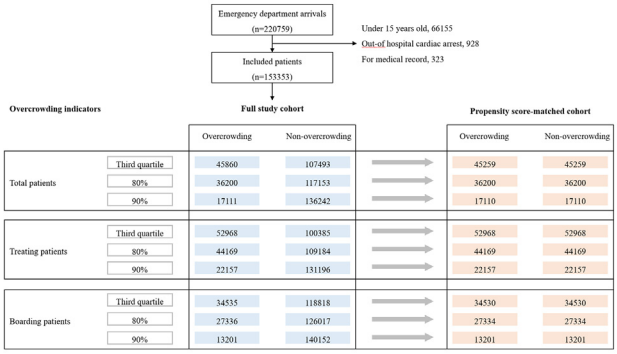
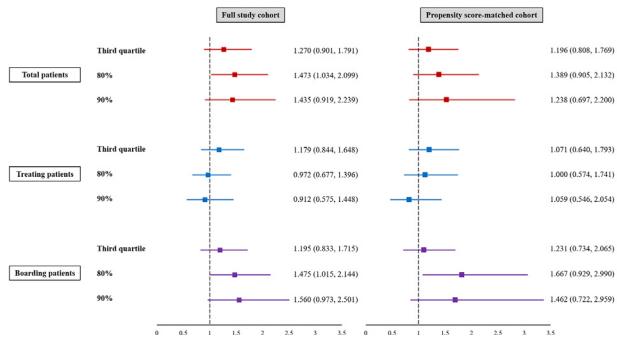


Table 1. Comparison of in-hospital cardiac arrest incidence according to the emergency department overcrowding in the full study cohort and the propensity score-matched cohort

Overcrowding indicator		Full study cohort			Propensity score-matched cohort		
		Overcrowding	Non-overcrowding	p-value	Overcrowding	Non-overcrowding	p-value
Total patient	third quartile	56/45860 (0.12)	104/107493 (0.10)	0.1590	56/45259 (0.12)	47/45259 (0.10)	0.3749
	80%	50/36200 (0.14)	110/117153 (0.09)	0.0227	50/36200 (0.14)	36/36200 (0.10)	0.1309
	90%	26/17111 (0.15)	134/136242 (0.10)	0.0407	26/17110 (0.15)	17/17110 (0.10)	0.1696
Treating patient	third quartile	59/52968 (0.11)	101/100385 (0.10)	0.5343	59/52968 (0.11)	49/52968 (0.09)	0.3357
	80%	44/44169 (0.10)	116/109184 (0.11)	0.7159	44/44169 (0.10)	36/44169 (0.09)	0.5830
	90%	23/22157 (0.10)	137/131196 (0.10)	0.9789	23/22157 (0.10)	28/22157 (0.13)	0.4836
Boarding patient	third quartile	44/34535 (0.13)	116/118818 (0.10)	0.1313	44/34530 (0.13)	40/34530 (0.12)	0.6623
	80%	40/27336 (0.15)	120/126017 (0.10)	0.0177	40/27334 (0.15)	22/27334 (0.08)	0.0222
	90%	22/13201 (0.17)	138/140152 (0.10)	0.0203	22/13201 (0.17)	13/13201 (0.10)	0.1279

Figure 2. Odds ratios for the incidence of in-hospital cardiac arrest according to the emergency department overcrowding in the full study cohort and the propensity score-matched (PS-matched) cohort



No, authors do not have interests to disclose

441 The Impact of On-Unit Reconstitution of Antibiotics to Expedite Treatment of Pediatric Patients With Possible Sepsis

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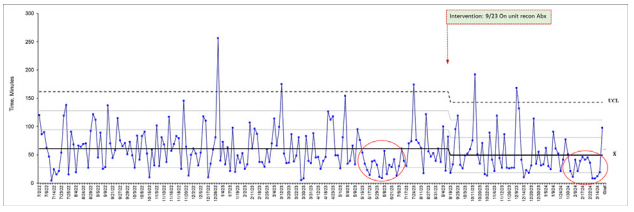
Study Objectives: Sepsis is a leading cause of morbidity and mortality in children in the United States. Recent guidelines suggest prompt antibiotic administration is one of the most important interventions to improving patient outcomes. Because medication dosing in pediatric patients is weight-based, the appropriate quantity of antibiotic may not be immediately available and reconstitution in a centrally located pharmacy may contribute to delayed administration. We implemented an on-unit antibiotic reconstitution program with a goal of decreasing time from antibiotic order to administration from 61 to 50 minutes for potentially septic pediatric patients.

Methods: This was a retrospective study as part of a larger quality improvement intervention evaluating the impact of on-unit antibiotic reconstitution on times from antibiotic order to administration and time from sepsis recognition to antibiotic administration. Criteria for possible sepsis were adapted from the Pediatric Sepsis Outcomes Collaborative and included a positive sepsis screen or huddle; sepsis order set usage; ICD-10 code for sepsis; or a combination of blood culture, antibiotics, and resuscitation medications. In the baseline period (7/22/23-9/18/24) antibiotics were ordered by the treating clinician in the EMR, prompting staff in a centrally located pharmacy to prepare the appropriate dose of antibiotics based on the patient's weight. Once mixed and verified, the antibiotic was delivered to the emergency department by a pneumatic tube system, which was then retrieved by the nurse and administered to the patient. In the intervention state, nurses were trained to reconstitute antibiotics in the medication room within the emergency department after the order was placed, eliminating involvement of central pharmacy in the process. Once reconstituted, the antibiotics could be walked to the patient's bedside and administered immediately. After training all pediatric emergency nurses in the process, the intervention was implemented on 9/19/2023. We collected data on time antibiotic order to administration and from sepsis recognition (time zero) to antibiotic administration before and after the intervention.

Results: A total of 168 patients with possible sepsis were treated during the baseline period, with 63 treated after the intervention. The time from antibiotic order to administration in the baseline and intervention periods were 61 and 49 minutes (p=0.01), respectively, a 20% reduction, while time zero to antibiotic administration were 117 and 100 minutes (p=0.09), a decrease of 15%.

Conclusion: Antibiotic administration in children with possible sepsis can be significantly expedited through on-unit reconstitution. While we trended towards decreased sepsis recognition to antibiotic administration times, further work is needed to decrease the time from sepsis recognition to antibiotic order placement and to more urgently prioritize antibiotic administration among other interventions for these patients.



No, authors do not have interests to disclose

442 The ICED-SODA Initiative: Improving Compliance With Emergency Department Sepsis OrDer Set Application

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Background: Sepsis management order sets have been shown to increase health equity and improve patient outcomes. Once sepsis criteria are identified, studies suggest that initiation of a treatment order sets can reduce the time to diagnosis, antibiotics, and fluid resuscitation, and improve compliance with correct fluid volume administration. Sepsis order sets have been shown to significantly decrease mortality and reduce hospital length of stay.

Methods: We utilized Lewin's three-step change management model as the basis for process improvement using a multidisciplinary team (the emergency department (ED) sepsis champions) consisting of emergency physicians, ED residents and PAs, ED nurses and ED nursing leadership. A multi-pronged, multifaceted educational intervention included: (1) nurse focused education and reiteration of sepsis recognition and management during daily huddles; (2) nurse, physician, PA and resident directed education on 3- and 6- hour sepsis bundle components; (3) nurse, physician, PA and resident individualized feedback related to the use of the ED sepsis order set and compliance. Educational components included in-person direct training from the ED sepsis champions, email and verbal communication, and case-specific provider-directed feedback for any non-adherence or fallouts. ED Code Sepsis activations are tracked and reported on the charge nurse shift report. Cases flagged as a code sepsis activation are reviewed daily for order set use. Sepsis bundle metrics and mortality are tracked by the sepsis program manager. Our primary goal was to increase ED sepsis order set utilization from current baseline measurement to 90% of patients ED Code Sepsis activations. We compared ED sepsis order set utilization before and after implementation of the change management model. Our secondary objective was to determine the change in SEP-1 three- and six-hour sepsis bundle metric compliance and overall sepsis mortality.

Results: From 12/1/23 to 3/30/24, there were 245 ED code sepsis activations. Utilization of the ED sepsis order set improved from 76.6% prior to the sepsis education campaign to 90.6% (difference 0.13, 95% CI 0.04 to 0.24). SEP-1 three-hour bundle compliance improved from 82.2% pre to 93% post (difference 0.11, 95% CI -0.02 to 0.23). SEP-1 six-hour bundle compliance decreased from 76.2% pre to 71.7% post (difference 0.04, 95% CI –0.17 to 0.23). Overall mortality has dropped from 24% pre to 23% post (difference 0.006, 95% CI –0.19 to 0.21).

Conclusions: A sepsis education plan has improved utilization of an ED sepsis order set and three-hours sepsis bundle metrics. However, the education plan has not improved six-hour sepsis bundle metrics or mortality. Increased attention on six-hour bundle metrics may be needed to improve overall mortality.

No, authors do not have interests to disclose

443 Improving Door to ECG Time at a Quaternary Care Emergency Department

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Study Objective: Timely diagnosis of ST-segment elevation myocardial infarction (STEMI) in the emergency department (ED) is dependent on timely electrocardiogram (ECG) testing. The American Heart Association recommends ECG testing within 10 minutes of ED arrival at chest pain accredited centers. A door to ECG time (DTE) of less than 10 minutes has been associated with improved time to intervention and reduced in-hospital mortality. The first 10 minutes of an ED visit often includes triage and registration before a physician encounter. Pre-established screening criteria are in place to help identify patients that should receive an ECG. Due an increase in patient volume, our ED observed an increase in DTE time. The objective of this quality improvement initiative was to increase compliance with DTE time less than 10 minutes to 75% for adult ED patients.

Methods: We initiated a quality improvement (QI) project at an academic, quaternary care ED in June 2022. The study design included several, rapid PDSA (Plan-Do-Study-Act) cycle changes to achieve the stated objective. Eligible patients included those presenting to adult ED triage with STOP sign criteria including chest pain, chest discomfort, arm/shoulder/jaw pain, shortness of breath (age > 30), dizziness, new syncope, palpitations, nausea/vomiting, upper abdominal pain (age > 50), and generalized weakness. Initial time stamp began at registration by a medical receptionist and ended when the completion button was pressed on the ECG machine prior to printing. Interventions included early identification of patients meeting STOP sign criteria, re-establishing role responsibilities, physical relocation of a pivot nurse with a dedicated space for ECG completion during high-volume times, staff education with daily feedback on previous days metrics, weekly rewards and recognition of staff who performed the fastest ECGs, and an increase in waiting room staff coverage.

Results: Following project initiation, compliance for DTE time of less than 10 minutes increased from a baseline of 53% to 81% in nine months despite increasing patient volume over the accompanying time frame. Three separate baseline shifts in

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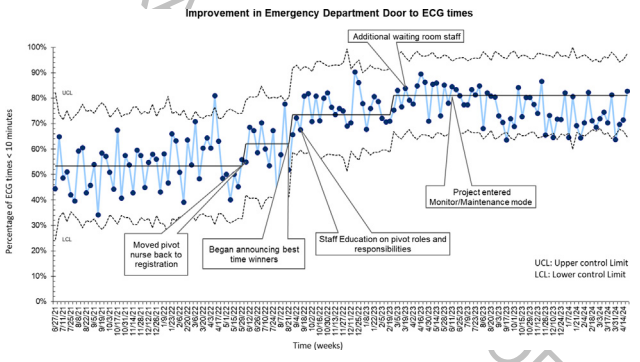
performance (figure) were associated with four key interventions: (1) physical relocation of a pivot nurse to identify patients upon arrival; (2) staff education; (3) recognition of high-performing staff; and (4) increase in waiting room staff coverage. We observed a statistically significant improvement in DTE times with median DTE times of seven minutes. Door to ECG time was sustained for over one year following project completion with no new interventions required. Several instances of special cause variation were observed in the negative direction likely to due to the absence of ongoing interventions, though no regressive baseline shift occurred.

Conclusion: This QI initiative using rapid PDSA cycle changes improved DTE within 10 minutes to more than 80%. Modification of nursing roles and positions, staff education, recognition of high-performers, and increased staffing were notable drivers of improvement. Results have been sustained without continued education or additional interventions.



No, authors do not have interests to disclose

444 Patient Identification of Their Emergency Department Providers: Assessing the Impact of a Targeted Intervention

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Study Objectives: In the dynamic environment of the emergency department (ED), establishing meaningful patient-provider relationships is challenged by the complex interplay of large care teams with diverse training levels. Recognizing the pivotal role identification plays in this interaction, we sought to address the prevalent issue of patients struggling to identify their providers. Our intervention aimed to enhance patient recognition of their care team during their ED experience.

Methods: A single-center prospective randomized controlled trial was performed at a large academic hospital from August 2022 to November 2023. English-speaking patients 18 years or older with at least 2 hours of exposure to ED staff were considered for inclusion. Exclusions applied to hemodynamically unstable or mentally altered patients. The randomized allocation placed individuals in alternating fashion into either the intervention or control group. Patients in the intervention group underwent additional education and were provided with photographs of their care providers, accompanied by a succinct explanation of each provider's role in their medical care. Following this intervention, both the intervention and control groups completed a survey while still in the ED. Categorical data underwent analysis through the Chi-square test, while continuous variables were assessed using the Kruskal-Wallis test.

Results: A total of 117 patients were enrolled with 56 assigned to the study arm and 61 to the control arm. Mean age across all patients was 56. Patient and provider demographics, including age, race, and education level, exhibited similarities between the groups. Notably, a female predominance was observed in the study group (67%, p=0.008). Patients in the study group were able to correctly identify their providers more frequently than controls (59.0% vs 41.1%, p=0.05). Identification was not influenced by whether the provider was masked (p=0.84).

Conclusion: Implementation of a targeted patient education intervention yielded improvements in patient identification of their providers in the ED setting.

	TOTAL (N =117)	CONTROL (N =56)	INTERVENTION (N=61)	P VALUE
PATIENT IDENTIFICATION OF PROVIDER - N (%)				0.05
CORRECT	59 (50.4%)	23 (41.1%)	36 (59.0%)	
INCORRECT	58 (49.6%)	33 (58.9%)	25 (41.0%)	
PATIENT GENDER - N (%)				0.008
MALE	52 (44.4%)	32 (57.1%)	20 (32.8%)	
FEMALE	65 (55.6%)	24 (42.9%)	41 (67.2%)	
PATIENT AGE - N (%)				0.17
18-29	12 (10.3%)	3 (5.4%)	9 (15.0%)	
30-65	61 (52.6%)	33 (58.9%)	28 (46.7%)	
> 65	43 (37.1%)	20 (35.7%)	23 (38.3%)	
PROVIDER GENDER - N (%)				0.48
MALE	65 (55.6%)	33 (58.9%)	32 (52.5%)	
FEMALE	52 (44.4%)	23 (41.1%)	29 (47.5%)	
PROVIDER AGE - N (%)				0.81
≥ 40	53 (45.3%)	26 (46.4%)	27 (44.3%)	
< 40	64 (54.7%)	30 (53.6%)	34 (55.7%)	
PROVIDER MASK - N (%)				0.84
YES	77 (66.4%)	36 (65.5%)	41 (67.2%)	
NO	39 (33.6%)	19 (34.5%)	20 (32.8%)	

No, authors do not have interests to disclose

445 Characteristics and Outcomes of Anaphylaxis in Older Emergency Department Patients

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Background: Older adults are a rapidly growing segment of the US population. However, little is known about the characteristics and outcomes of anaphylaxis in these patients. The study objective was to describe differences in anaphylaxis triggers, presentation, management, and outcomes between older adult emergency department (ED) patients compared to younger adult patients.

Methods: We conducted a cross-sectional study of adult patients presenting to an academic ED who met anaphylaxis diagnostic criteria from April 2008 to December 2022. We compared patient characteristics and outcomes between patients 65 and older verses 18-64 years using chi-squared analysis. Significance was determined based on p-values corrected for multiple comparisons. The association between patient age group with intubation and ED disposition was also assessed using multivariable logistic regression adjusted for patient sex and variables previously shown to be associated with increased anaphylaxis severity (reaction trigger, antihypertensive medication use, chronic lung disease, cardiovascular disease, and delayed epinephrine administration).

Results: Among 1,264 patients included for analyses, 200 (15.8%) were older adults. Older adults were less likely to have a food trigger (14.0% vs 28.1 %; OR 0.42, 95% CI 0.27, 0.63), and more likely to have medications (35.0% vs 22.5%; OR 1.86, 95% CI 1.34, 2.57) or intravenous (IV) contrast (13.5% vs 6.3%; OR 2.32, 95% CI 1.44, 3.73) as a trigger. They were less likely to have mucocutaneous involvement (94.0% vs 98.5%; OR 0.24, 95% CI 0.11, 0.51), but more likely to have cardiovascular involvement (66.0% vs 52.6%; OR 1.75, 95% CI 1.27, 2.40), including syncope (17.5% vs 7.3%; OR 2.68, 95% CI 1.74, 4.13) and hypotension (29.0% vs 11.3%; OR 3.21, 95% CI 2.24, 4.60). The proportion of patients with any respiratory system involvement was not significantly different between the age groups (80.5% vs 83.8%; OR 0.80, 95% CI 0.54, 1.17), but older adults were more likely to have hypoxemia (15.0% vs 5.0%; OR 3.37, 95% CI 2.09, 5.42). Older adults were more likely to arrive by emergency medical system (EMS) transport (58.0% vs 34.5%; OR 2.62, 95% CI 1.93, 3.57), but were nearly half as likely to receive epinephrine during EMS transport (OR 0.53, 95% CI: 0.34, 0.83). There were no significant differences between age groups in proportions of patients who received epinephrine, antihistamines, steroids, bronchodilators, or IV fluids when including pre-hospital and ED administration. After multivariable adjustment, older adults were nearly twice as likely to be admitted to the hospital or intensive care unit (ICU) (OR 1.97, 95% CI 1.31, 2.96) and 7 times as likely to be intubated (OR 7.02, 95% CI 2.69, 18.30).

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Conclusion: Older adults with anaphylaxis are more likely to have medications or IV contrast as a trigger for anaphylaxis and have severe anaphylaxis resulting in intubation and hospital or ICU admission even after adjustment for factors associated with severe anaphylaxis. Opportunities exist to improve rates of early epinephrine administration by EMS for anaphylaxis in older adults. Further studies are needed to better understand and mitigate the risk of severe anaphylaxis in older adults.

No, authors do not have interests to disclose

EMF 446

Adapting a Brief Emergency Department Fall Prevention Intervention for Persons Living With Dementia and Their Caregivers

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Study Objectives: GAPcare, the Geriatric Acute and Post-Acute Fall Prevention Intervention, is a multicomponent intervention initiated in the emergency department (ED) to reduce recurrent ED visits for falls. In GAPcare, participants receive a pharmacy and physical therapy consultation to reduce modifiable risk factors for falls prior to discharge. The GAPcare randomized controlled trial reduced fall related ED visits by 66% and did not prolong ED length of stay. However, few persons living with dementia (PLWD) were included (n=18/n=110). Adaptations to GAPcare are needed to meet the unique needs of PLWD and caregivers.

Methods: We performed semi-structured interviews with key partners to identify adaptations and approaches to integrate a refined GAPcare into typical ED workflow. Patients were recruited from the ED and eligible if they had known dementia or screened ≥2 on the AD8 Dementia Interview. Patients were asked to identify a caregiver for the interview. Recruiters and interview facilitators were bilingual in English and Spanish. Interviews were held after the ED visit via video conference. We used purposive sampling to identify experts with knowledge of dementia, caregiving, ED operations, or ED research. Interview guides were tailored to participant type. We analyzed interviews using rapid qualitative analysis guided by Castro's framework for adapting interventions.

Results: From August to April 2024, we completed interviews with 6 patients and 2 caregivers (1 dyad, 6 individual), and 15 experts (5 physicians, 3 nurses, 3 physical therapists, 3 pharmacists, 1 PhD scientist). Seventeen of 23 interviewees were women. Interviews revealed that patients, caregivers, and experts were open to GAPcare. However, participants' responses indicated that tailoring at multiple levels (patient, ED, and PLWD healthcare context) would be required for the intervention to succeed given the complexities in patients' circumstances (eg, living arrangements, language, income) and cognitive abilities. This included training and education of ED staff in dementia care and caregiver support (ie, how to balance reliance on the caregiver for information while engaging and focusing on the patient). Experts noted that specific challenges exist in medication review for PLWD including inaccurate accounting by patients/caregivers and incomplete electronic health record data, but they agreed that modifying high fall-risk medications in PLWD is paramount. Caregivers and experts noted that some PLWD live in assisted living/memory care and communicating with facilities about medication changes is critical to adoption of recommendations. Themes are summarized in the table.

Conclusion: ED patients with dementia, their caregivers, and experts in dementia and ED operations and research strongly support adapting an ED fall prevention intervention for dementia. Tailoring to the individual patient and ED environment are important to ensure success of the adapted GAPcare intervention.

Table 1. Major themes and quotes

Theme	Description	Quote
Patient level tailoring	• Importance of recognizing the patient's stage of dementia and tailoring communication appropriately. • Tailoring communication to balance reliance on caregivers for information while still engaging and focusing on the patient. • Education for caregivers of patients with ADRD regarding the difference in GAPcare PT and other PT.	"The staff where he lives is not—they don't have enough staff to do that kinda thing, so I would definitely be working with him to do the exercises afterwards, which comes and goes. I'm here. Then I'm visiting family for a while, or taking a trip, and anyway." -SID 101 "She'd been through physical therapy quite a bit, but for her, it's not you know. I don't see any benefit having the physical therapist come. It would be good to do, come and evaluate, and see if they see something that could be changed. That part I like, but as far like ongoing physical therapy for her, I'm not sure it would benefit her. At her age and the way she is, sometimes, she gets frustrated with too much." -SID 202 "Well, I think that some of the reason that people might fall when they have dementia is because of things that are in the living environment that they're in. There could be loose rugs, or cords, or the patients are confused on where they're at. This intervention will help with some of the aspects, but it would be really great to have someone go into the home as well to do a follow-up visit. A physical therapist or occupational therapist to go into home and do a home eval post ED visit. Patients with dementia depending on the severity may be falling differently. They could be in a wheelchair, for example. That's gonna be a lot different of an approach perhaps than someone who is mobile." -SID 302
ED level tailoring	• Medication reconciliation is challenging because clinicians must rely on care partners or EPIC, but neither may be accurate. Tailoring to ED workflows to improve medication reconciliation is needed to deliver GAPcare to patients with ADRD. • The timing of intervention delivery should be tailored to each ED, including which personnel would be responsible for implementation depending on the time of the patient's admission to the ED.	Patient and Caregiver opinions on medication review: Caregiver: "We struggled with it a bit because that's not something I had at my fingertips, and I think Dad's pretty unaware of what medications he's on. Is that fair to say?" Patient: "Yes, I'm quite unaware, really." Caregiver: "Yeah, so he's not aware of what he's taking, and I have not done a very good job of keeping that at my fingertips. I think I put an updated list in my packet in the car for next time, but emergency trips, by definition, catch you off guard, so that was hard. I didn't have a complete list and dosage and all that stuff" -SID 201 "I'm just gonna be honest. I don't trust medication reviews that I don't do. I just see they're inaccurate a lot of the time. Because the family doesn't necessarily know if they don't have the bottles with them. If the patients have a PCP somewhere else, and EPIC doesn't have their accurate medication list, which EPICs not always accurate anyway, then I think it'll be difficult to know for sure what medications are on it unless it's the pharmacy fill history is reviewed, which we can see in EPIC." -SID 302 "I would want to know if it was possible to provide a anticipatory volume which is obviously gonna be different depending on the site, but I think that's a helpful metric to say like, "This is gonna have a huge impact. There's gonna be a ton of patients or not" and then again it helps inform if you need to hire more people for that. Do we need to have a DME closet if there's gonna be so much PT assessments, or what do we need to have in that closet? Do we need to increase the stock because we're gonna be giving out so many more wheeled walkers or whatever? Yeah, I think that's—those are the big questions I would have I think." -SID 311 "If you don't have the coverage on the weekend, how do we capture this patient that really would benefit? There's always gonna be those questions as well. Like if this is so automated that it automatically—like even if it doesn't happen while the patient's in the emergency department 'cause we don't

		have the resources for this specific intervention, 'cause we don't have 24/7 physical therapy, does this mean we're gonna have to put more people in our observation area to wait for the GAPcare intervention, increasing our length of stay, increasing the number of patients that are physically in the department for longer?" -SID 303
Healthcare context tailoring	• The patient's circumstances will impact delivery of GAPcare and may require specific processes (e.g., depending on their living situation). • The patient's insurance coverage may also impact delivery of GAPcare and could require tailoring.	"One thing I think that would need to happen is there would need to be good communication with patients who live in a facility to make sure that if a medication is identified as part of the fall, and it's stopped, that the facility gets communication from the ER to say to stop it. It has to be a—usually it can't be a verbal order. It has to be a written or faxed order. That would be something that would be really important to think about. How is that gonna be operationalized?" -SID302 "Yeah, I think it's a good approach, and I hope the insurance companies support it 'cause I think that would be a big thing. With my mom, if they said, 'Well, the insurance company won't pay for this,' it—we don't have a lot of resources so for her to do that." -SID 202

No, authors do not have interests to disclose

EMF 447 What Matters Most to People With Dementia in the Emergency Department: A Qualitative Study

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Study Objectives: Healthcare improvement initiatives increasingly emphasize aligning care of older adults with "what matters most" to them, ie, their care preferences and priorities in their health. Emergency department (ED)-based research has demonstrated that routine ED care may not align with what older adults want out of their healthcare, and particularly those with dementia. This study aimed to identify the care preferences of people with dementia and their experiences communicating with ED care teams about what matters most to them.

Methods: We conducted qualitative semi-structured interviews with people with dementia and their caregivers about their care preferences and experiences of communication with the care team during ED visits. We used chart review to identify participants who met inclusion criteria from January-February 2024: (1) established diagnosis of dementia, (2) age 60+, (3) English- or Spanish-speaking, (4) caregiver contact information listed in chart, (5) community-dwelling. Participants were recruited from a public safety net hospital in Texas that serves a majority Hispanic and underinsured population. Depending on the patient's dementia severity, social supports, and family preferences, interviews were performed with patient-caregiver dyads/triads or with caregivers alone. To identify patient care preferences, we used Patient Priorities Care, an evidence-based framework used in outpatient geriatrics care. We used an inductive approach to qualitative data analysis, in which themes emerge from participant responses rather than a priori hypotheses. Two researchers independently coded each transcript, and consensus discussions were held to resolve discrepancies and elucidate themes.

Results: Interviewees included 14 people with dementia and 19 caregivers. All participants identified as Hispanic. Interviews revealed three major themes. First, people with dementia highly valued being at home and spending time with loved ones and family members. Second, people with dementia and caregivers experienced hospitalization as a decision made for them by clinicians, rather than one in which they provided input. Caregivers described communication in terms of information flow from clinicians, rather than as an interactive discussion. Third, hospitalization was disorienting, isolating, and uncomfortable for people with dementia. Participants' experiences of hospital admission involved agitation, weight loss, and isolation.

Conclusion: In our sample of community-dwelling Hispanic people with dementia, participants felt they had little choice in hospital admission decisions from the ED and experienced significant distress during hospitalization. This finding is important given that people with dementia have higher admission rates from the ED than those without dementia. Future research should explore how what matters most to people with dementia can be incorporated into ED admission decisions.

No, authors do not have interests to disclose

EMF 448 Characterizing Emergency Department Disposition Conversations for Veterans With Dementia Using Direct Observations

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Study Objectives: For Veteran persons living with dementia (PLWDs), one of the most impactful and costly elements of emergency department (ED) care is the decision to discharge or admit to the hospital- the "disposition" decision. When more than one reasonable option exists regarding a health care decision, such as the decision to admit or not, it requires a complex conversation between patients, care partners, and ED providers. However, data on best practices in ED communication and shared-decision making for PLWDs and their care partners are limited. The primary objective of this study is to use mixed qualitative methods to characterize current practices in disposition conversations for PLWDs.

Methods: *Design:* Aim 1 uses direct observation methods to characterize discussions about dispositions. Observations are analyzed using the constant comparative method, focused on domains of shared decision-making based on the Ottawa Decision Support Framework. Aim 2 uses semi-structured interviews with PLWDs and care partners participating in Aim 1 to identify facilitators and barriers to participating in disposition decision making, with interview guides structed around elements of decision support observed in Aim 1. Aim 2 interviews are analyzed using content analysis. Additional baseline data on patients and care partners collected includes dementia severity using the informant-based Dementia Severity Rating Scale (DSRS), patient demographics, and caregiver burden. *Setting:* Durham VA Medical Center Emergency Department. *Participants:* Inclusion criteria: 1) patient age $\geq$65, 2) dementia diagnosis documented in the electronic medical record; 3) community dwelling, 4) patient and/or care partner able to discuss disposition in English, and 5) has an uncertain disposition after study PI clinician review of initial triage note and vitals. Exclusion criteria include 1) has no care partner available in the ED, 2) triaged as Emergency Severity Index Level 1, and 3) medical instability or acute altered mental status/delirium.

Results: 9 dyads were observed during an ED visit, with 3 PLWDs and 8 care partners provided follow-up interviews. Principal themes from ED visit observations include: 1) features of shared-decision making more frequently observed include "establishing rapport" and "providing information," 2) features of shared decision-making less frequently observed include "clarifying the decision and inviting participation," "discussing decisional roles," and "clarifying personal values," 3) PLWDs and care partners had varied levels of participation in discussions, and 4) specific concerns of the PLWDs or care partners may not be voiced to the provider until after the disposition decision is conveyed. From Aim 2 interviews, principal themes include: 1) many participants had a preference about disposition before the ED visit and 2) if they are in agreement with the final decision, they are satisfied without significant participation discussing disposition.

Conclusions: Observations of ED visits for Veterans with dementia demonstrate that certain features of shared decision-making are not typically addressed when making decisions about disposition. A decision support tol may be helpful to improve communication around clarifying the decision to be made, inviting participation, and identifying personal values to ensure that the disposition is concordant with their preferences when possible. Other findings from observations include that communication about important issues from the perspective of PLWDs and care partners may be fragmented throughout the ED visit- this may also be amenable to an intervention to support ED communication.

No, authors do not have interests to disclose

449 The Effect of Early Sepsis Recognition and Fluid Bolus Initiation on Hospital Outcomes Among Patients With Septic Shock

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Study Objectives: Sepsis is the leading cause of inpatient mortality in the United States. Timely intervention plays a crucial role in optimizing patient outcomes, though controversy exists about the timing and volume of fluid resuscitation. The goal of this study was to evaluate the relationship of time to fluid bolus initiation to mortality among patients with septic shock.

Methods: This was a retrospective cohort study in a large community health care system (310,000 annual emergency department (ED) visits) of all adults > 18 years old admitted from January 2017 through December 2022 with an ICD-10 diagnosis of sepsis and septic shock as defined by an initial ED systolic blood pressure (SBP) < 90 mmHg, mean arterial blood pressure <65 mmHg, or lactate ≥ 4 mmol/L. Time zero was defined as the ED arrival time and initiation time was defined as the first fluid bolus given time as recorded in the EHR. Generalized linear models were used to assess the adjusted relationship between the time to fluid bolus initiation and overall hospital mortality and mechanical ventilation use. Covariates adjusted for include age, sex, comorbidities, emergency severity index, best practice alert, lactate, NEWS score, ICU admission, and mechanical ventilator use.

Results: In a cohort of 1,602 patients meeting inclusion criteria, the median age was 70 years, 51.4% were female, and 65.8% were White. Median initial SBP and lactate were 88mmHg and 4.2 mmol/l respectively. Overall mortality was 24.22%, with 28.7% of subjects requiring mechanical ventilation. 952 (59.4%) had a fluid bolus initiated in the first hour after ED arrival, while 451 (26.3%) and 229 (14.3%) had a fluid bolus initiated during the second hour and after the second hour respectively. Compared to patients whose fluid bolus was initiated more than 2 hours from ED arrival, initiation of a fluid bolus within the first or second hour was associated with reduced mortality [first hr: OR 0.67 (95% CI 0.45-0.98), p=0.04; second hr: OR 0.62 (95% CI 0.40-0.96), p=0.03]. We observed increased mortality when the fluid bolus is initiated after 2 hours from ED arrival [> 2hr: OR 1.53 (95% CI 1.06-2.22), p=0.03]. The requirement for mechanical ventilation was increased when fluid bolus was initiated later than 2 hours from ED arrival, though this result was not statistically significant [>2 hr: OR 1.27 (95% CI 0.87-1.84), p=0.21].

Conclusion: Consistent with other recent reports, our finding shows that early sepsis recognition and fluid bolus initiation in the ED are associated with improved survival benefits among septic shock patients. These data support the current SEP-1 recommendations for fluid resuscitation.

Yes, authors have interests to disclose
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Disclosure: 410 Medical
Employee 410 Medical

450 A Video Review-Based Clinical Assessment Tool of Cardiac Arrest Resuscitation Correlates With Higher Chest Compression Fraction

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Study Objectives: Poor quality cardiopulmonary resuscitation (CPR) has been shown to lead to worse outcomes in cardiac arrest (CA), demonstrating the need for education and quality improvement (QI) processes. Although video review is a powerful QI tool, to date there is no standard video review-based assessment tool for CA. Our institution began video review of emergency department (ED) CA resuscitations in 2018, coupled with feedback to staff and process improvements based on an assessment tool devised from the experience of conducting video reviews. We hypothesize that higher clinical assessment scores are associated with higher chest compression fractions (CCF).

Methods: This was a retrospective study of all video-reviewed, non-traumatic adult CA resuscitations from a quaternary care academic ED between 01/2018 and 12/2023. All videos were reviewed by one of two board-certified emergency medicine and critical care physicians for data extraction. Data were entered into the CA data registry by other investigators. The reviewers scored the CA videos using a standardized clinical assessment tool consisting of 15 qualitative and quantitative metrics in 5 domains (preparation, airway and breathing, circulation, resuscitation, communication) (Figure), which were graded as either successful, not successful, or unable to assess/not applicable. Each category was then assigned a score of one if completed and zero if not completed, resulting in a total score range of 0-15. CCF was measured throughout the video's duration, using video timestamps in the CA registry. Differences in total and domain specific scores were compared between cases with CFFs < 90% versus ≥ 90% using Wilcoxon rank sum tests. A Cochran-Armitage trend test was used to assess for a significant linear trend in scores by years.

Results: During the study period, 350 CA videos were reviewed, of which 325 had complete scores included in analysis. Per category overall success is presented in the Figure. Overall median CCF was 90% (IQR: 86%, 93%). Median total score was significantly lower among cases with CCF < 90% compared with cases with CCF ≥ 90% (median total score of 10 (IQR: 8, 11) versus 11 (IQR: 9, 12); p-value 0.0001). The circulation and resuscitation domains had statistically significant differences in scores (3 (IQR: 2-3) versus 2 (IQR: 2-3) (p=0.0021) and 3 (IQR: 2-4) versus 3 (IQR: 2-3) (p=0.0005) respectively). Annual trends showed the categories of airway and breathing (p<0.05), resuscitation (p<0.0001), and total score (p<0.014) to be significantly different, with lower scores in 2020 and 2021, likely due to the pandemic. Two metrics in resuscitation ("Appropriate timing/performance of CPR cycle, pulse check, rhythm determination" and "Majority of CPR interruptions <10 seconds") showed consistent annual improvement (p<0.05).

Conclusions: Our clinical assessment tool score is associated with higher CCF, a marker of high-quality CPR. This is the first instance of a video review-based assessment tool for CA. Future studies should focus on external validation and confirmation of association with more patient-oriented outcomes.

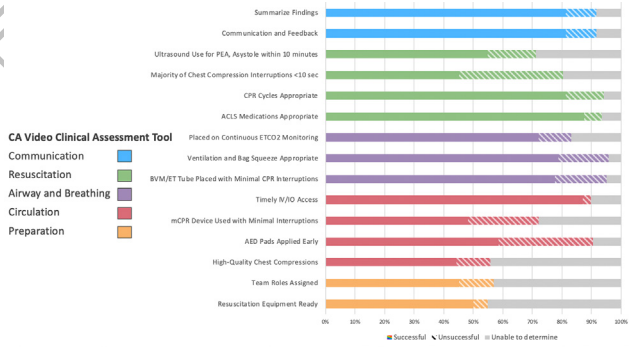

Figure 1: *A bar graph showing the percent successful, unsuccessful, and unable to determine of each of 15 metrics assessed using the CA video clinical assessment tool for all video recorded CAs from 2018 to 2023. Metrics are grouped into five overarching domains, demonstrated by color. Note that the Preparation domain was not applicable for all emergency department CAs.*

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451 Lost Opportunities in the Management of Critically Ill Patients Boarding in the Emergency Department

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Study Objective: Emergency department (ED) boarding of critically ill patients has been identified as a significant contributor to increased mortality for this patient population for nearly two decades. The volume of critically ill patients continues to increase without a concomitant increase in intensive care unit (ICU) beds. We can simply accept that boarded ICU patients will continue to have worse outcomes, or we can seek alternate treatment modalities to address this issue. ED Critical care teams have a role in the management of these patients having previously been associated with improved time to operative intervention and even mortality. However, their expansion has been limited due to multiple factors including shortages of intensivists, space requirements, and cost. Our goal was to assess the impact of implementing a critical care team in the emergency department.

Methods: A retrospective chart review was conducted on 502 patients admitted to intermediate or intensive care units via our academic and quaternary referral ED between September 2019 and March 2020. During this time an ED Critical Care team (ED3CT) was semi-randomly available within the department and would provide either direct takeover of the care or indirect care via consultation at the discretion of the primary ED attending to critically ill patients boarding in our ED. Data on patient management, hospital costs, ED professional charges, procedures, and ED length of stay (LOS) were analyzed.

Results: Of the 485 patients with complete data, 127 had their care transitioned to the ED3CT. Patients managed by the ED3CT were five times more likely to be downgraded to a lower level of care after takeover by the ED3CT. Professional charges were approximately 40% higher on patients managed by the ED3CT, indicating increased time spent at the bedside and lost billing to the department. Additionally, there was a 100% increase in procedures performed per patient by ED3CT. However, patients managed by the ED3CT experienced slightly longer ED LOS and higher total hospital charges.

Conclusions: In conclusion, the addition of a critical care team on various days to our academic emergency department identified multiple opportunities to improve patient care, billing, and education. As the burden of critical illness continues to accumulate without a proportional increase in ICU beds, our data suggests there may be benefit to both patients and hospitals in developing and implementing ED Critical care teams more broadly.

No, authors do not have interests to disclose

453 Found Down and Cold… but Dead? Outcomes Following Hypothermic Out-of-Hospital Cardiac Arrest Without a Witnessed Abrupt Cause for Hypothermia

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Study Objectives: Hypothermic out of hospital cardiac arrest (OOHCA) following cold-water immersion or avalanche is associated with improved outcomes, justifying prolonged emergency department (ED) resuscitation efforts. Hypothermic OOHCA patients without an apparent abrupt cause for hypothermia present a dilemma for emergency physicians. The purpose of this study was to compare outcomes among hypothermic and non-hypothermic OOHCA arrest patients "found down" following unwitnessed arrest who were transported to the ED and required ongoing CPR in the ED.

Methods: This secondary analysis of Resuscitation Outcomes Consortium (ROC) "Epistry" data utilized the subset of included OOHCA patients transported to hospital by EMS and with a recorded initial ED temperature. We defined "found down" as any patient with unwitnessed OOHCA who received prehospital chest compressions. We excluded patients less than 15 years of age, those who achieved sustained return of spontaneous circulation (ROSC) prior to ED arrival, those without a core temperature recorded within 30 minutes of ED arrival, and those with targeted temperature management/therapeutic hypothermia timestamped prior to temperature ascertainment. Patients with a core temperature less than 32 degrees Celsius were classified as hypothermic, and those with a core temperature of 32 degrees Celsius or greater were categorized as non- hypothermic. We compared the frequency of survival to hospital admission, survival to hospital discharge, and survival with good neurologic status (ie, Modified Rankin Scale (MRS) $\leq$ 3) for hypothermic and non-hypothermic patients using Fisher's exact test.

Results: Among 637 OOHCA patients meeting the inclusion criteria, 34 were hypothermic patients and 603 were non-hypothermic. Hypothermic patients were younger (median 57 vs 63 years, p=0.049) and more often encountered at non-residential scene locations (38% vs 15%, p=0.001) than non-hypothermic patients, but the two groups were statistically similar in terms of sex, initial arrest rhythm, arrest etiology, bystander CPR and EMS on-scene duration. Survival to hospital admission (6/34 [17.7%] vs 184/603 [30.5%], p=0.126) and survival to hospital discharge (1/34 [2.9%] vs 18/603 [3.0%], p=0.999) did not significantly differ for hypothermic and non-hypothermic patients. Survival with good neurologic status (1/34 [2.9%] vs 9/603 [1.5%], p=0.425) also did not significantly differ for hypothermic and non-hypothermic patients.

Conclusion: Hypothermic OOHCA patients who are "found down" following unwitnessed arrest, and are transported by EMS without achieving sustained ROSC, do not have increased rates of survival, nor improved neurologic status, when compared with similar non-hypothermic OOHCA patients.

No, authors do not have interests to disclose

455 Analysis of Vector Change Defibrillation by Paramedics for Prehospital Refractory Ventricular Fibrillation

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Study Objectives: The primary objective of this study was to evaluate the efficacy of vector change defibrillation in managing refractory ventricular fibrillation (rVF) and its impact on achieving return of spontaneous circulation (ROSC). Additionally, we aimed to characterize the demographics of patients experiencing rVF within a large EMS system.

Methods: We conducted a retrospective cohort study with a historical control group. Patients meeting the criteria for refractory ventricular fibrillation (rVF) arrest were identified from two distinct time periods: from the initiation of the new protocol in early 2019 until the end of 2023 for the intervention group, and from 2017 until the implementation of the new protocol for the control group. The new protocol introduced prehospital vector change defibrillation for patients experiencing cardiac arrest due to rVF. Refractory VF was defined as patients with persistent VF despite receiving at least three defibrillation shocks, three doses of epinephrine, and antiarrhythmic. Retrospective data predating the protocol initiation were retrieved to conduct a 3:1 propensity score matching between the control and vector change groups, based on age, gender, and initial $ETCO_2$ value, aimed at mitigating bias. The primary analysis to discern differences in achieving return of spontaneous circulation (ROSC) between the control and vector change groups employed a logistic regression model, with treatment group as the independent variable and ROSC status as the dependent variable.

Results: Demographic data between experimental and control groups were compared and no significant difference was found in age (P=.853), sex (P=.945), and initial $ETCO_2$ (P=.755) demonstrating similarity between the two groups. The results of our primary objective were summarized as an odds ratio (OR) with a 95% confidence interval (CI). The OR for this analysis was found to be not significant, indicating no significant difference in the odds of achieving ROSC between the two groups **(Table).**

Conclusion: The DOSE VF trial indicated promise in the treatment of refractory ventricular fibrillation (rVF) with both vector change and double-sequential defibrillation. However, in this retrospective cohort study, no significant difference was observed in achieving ROSC between the control and vector change groups. It's important to acknowledge certain limitations, including the absence of randomization and the single-system nature of the study. Nonetheless, the study achieved a relatively large sample size, ensured demographic similarity between groups, and utilized propensity score matching to minimize bias. Despite these efforts, conflicting results from various studies suggest the necessity for further investigation into the efficacy of vector change defibrillation.

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	Control (n=291)	Experimental (n=97)
ROSC	104 (35.7%)	30 (30.9%)
No ROSC	187 (64.3%)	67 (69.1%)

OR (95% CI): 0.805 (0.492,1.318)

No, authors do not have interests to disclose

456 Non-Linear Relationship Between Alcohol Consumption and Neurological Outcomes in Patients With Out-of-Hospital Cardiac Arrest Presenting to the Emergency Department

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Study Objectives: Out-of-hospital cardiac arrest (OHCA) presents a formidable challenge to public health, characterized by high mortality rates and often poor neurological outcomes among survivors. A variety of factors, including underlying comorbidities and external triggers, are known to influence both the incidence and outcomes of OHCA. However, the specific impact of lifestyle factors, particularly alcohol consumption, on the neurological prognosis in patients with OHCA is less understood. This study aimed to examine the potential association between the frequency of alcohol consumption and neurological outcomes in patients with OHCA.

Methods: This retrospective observational study used data from the Korean Cardiac Arrest Research Consortium (KoCARC) registry, encompassing 62 hospitals in Korea. Patients aged over 18 years who experienced OHCA and were subsequently transported to medical facilities by the public emergency medical service system were included. Patients were stratified into four distinct categories based on their reported alcohol consumption: never drinkers, light drinkers (up to 3 drinks per week), moderate drinkers (4 to 14 drinks per week for men, and 4 to 7 for women), and heavy drinkers (more than the moderate category limits). The study's primary outcome focused on evaluating the neurological status at the time of hospital discharge, quantified by a cerebral performance category (CPC) score of 1 or 2, indicating favorable neurological outcomes.

Results: The analysis included a total of 6,671 patients who suffered from OHCA during the study period. Of these, approximately 14.7% achieved a favorable neurological outcome. The likelihood of achieving a good neurologic outcome was reduced by 0.597 (95% confidence interval [CI] 0.444–0.802, p<0.001), 0.650 (95% CI 0.431–0.983, p=0.041), and 0.666 folds (95% CI 0.448–0.989, p=0.044) for never, light, and heavy drinkers, respectively, compared to moderate drinkers. These findings suggest a nonlinear relationship between the frequency of alcohol consumption and the neurological outcomes post-OHCA, with moderate drinking potentially conferring a protective effect.

Conclusion: This study revealed a nonlinear association between the frequency of alcohol consumption and neurological prognosis in patients with OHCA. Future research should focus on investigating the mechanism underlying the potential brain-protective effects of alcohol to further understand its impact on neurological recovery following OHCA.

	All NPPAs	*Fellows*	*Non-Fellows*
Mean	2.94	3.08	2.89
Standard Error	0.02	0.02	0.03
Median	2.95	3.09	2.88
Standard Deviation	0.31	0.18	0.33
Sample Variance	0.10	0.03	0.11
Range	2.49	0.79	2.49
Minimum	1.92	2.64	1.92
Maximum	4.41	3.43	4.41
Confidence Level(95.0%)	0.04	0.05	0.05
Upper CI (95%)	2.98	3.13	2.94
Lower CI (95%)	2.90	3.03	2.83

No, authors do not have interests to disclose

458 Identification of a Safe and Effective Distal Femur Insertion Site for Intraosseous Access in Adults

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Background: Rapid vascular access is an essential step in the resuscitation of critically ill patients. When patients have difficult vascular access (DVA), traditional routes of vascular access such as peripheral and central venous access prove challenging and time-consuming whilst intraosseous (IO) access can serve as a rapid and safe alternative. The distal femur's anatomical characteristics, including proximity to the skin surface, size of the bone, good blood flow, and minimal interference with resuscitation maneuvers, make it an attractive option for IO access. The suprapatellar bursa, which is intra-articular in 90% of cases poses the theoretic risk of the joint space, potentially leading to a septic knee, and should try to be avoided during insertion. This study focused on how best to identify the ideal anatomical insertion site for the distal femur avoiding neurovascular structures and the suprapatellar bursa as well as the required IO needle length for insertion for our patient population.

Methods: This is an analysis of retrospectively and sequentially selected 111 knee MRI scans from predefined date comprising demographic information and key anatomical parameters relevant to IO needle placement. The IRB exemption was received from the organization. Two blinded radiologists reviewed MRI images of the knee to ensure equivocal interpretation and identification of anatomical landmarks. MRI images were analyzed to see the maximal height of the suprapatellar bursa above the proximal pole of the patella to identify an appropriate insertion site. The radiologists then were to inspect the location of neurovascular structures at this level. Finally, the radiologists calculated the following measurements: distance from skin to cortex, and distance from skin through cortex. Anthropometric factors such as weight, height, and BMI were measured.

Results: The average and median ages of individuals comprised 52.4 and 55 respectively. Out of which 56 % were female and 89.2% were white. The median weight of individuals was 206 pounds with an interquartile (IQ) range of 171 to 250 for 25 and 75 percentiles. The median BMI of the study group was 32 with a maximum population comprising a BMI of >35 (33.3%) [Table 1]. There were no significant measurement differences noted between the two radiologists. The average measurements of both radiologists were used to interpret the data. The median distance above the patella/suprapatellar bursa was 34.5 mm (IQ 25, 75: 27.2, 40.5) with a maximum distance of 60.5 mm. The median distance from skin through cortex was 38.2 mm (IQ 25,75: 34.0, 43.3) and a maximum of 55.1 mm [Table 2]. The Figure shows the linear relation between the median BMI and the adequate distance from skin through cortex required for IO insertion. It was observed that there were no significant anterior midline anatomical structures that would preclude insertion at the midline anterior site. This location helps avoid neurovascular structures located medially and posteriorly, minimizing the risk of inadvertent injury during insertion. Insertion of 5 cm proximal to the proximal pole of the patella minimized the risk of suprapatellar bursal breach. Furthermore, the study addresses concerns regarding needle length adequacy, particularly in patients with increased soft tissue depth in the distal thigh region. The data revealed that over a quarter of subjects had a skin to inner cortex distance of >40mm, suggesting the need for a needle longer than the currently maximal available 45mm to ensure adequate insertion depth.

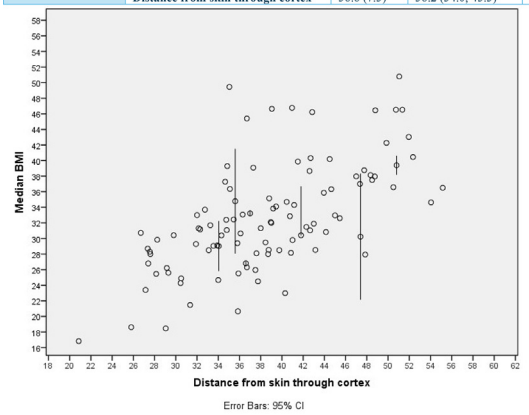
Conclusions: The distal femur site for IO insertion that is midline, anteriorly, and 5cm above the proximal pole of the patella avoids most suprapatellar bursae and neurovascular structures. For some patients, the currently available maximal length of 45mm needles may not be of adequate length for insertion in the distal femur due to increased soft tissue and cortex depth.

Table 1. Demographic and clinical characteristics of population for study.

Variables		Patient population	P-Value
		Count (%)	
	Total	111	
Age	Median (IQ 25, 75)	55.0 (45,63)	
	Mean (SD)	52.4 (14)	
	18-39	21 (18.9)	<0.05
	40-59	49 (44.1)	
	60-79	41 (37)	
Sex	Male	49 (44.1)	<0.05
	Female	62 (55.9)	
Race	White	99 (89.2)	<0.05
	Black Or African American	5 (4.5)	
	Unknown/Multiracial	4 (3.6)	
	Multiracial	1 (0.9)	
	American Indian or Alaskan Native	1 (0.3)	
Ethnicity	Non-Hispanic	104 (93.7)	<0.05
Weight (lbs.)	Mean (SD)	212 (50)	
	Median (IQ 25, 75)	206 (171, 250)	
Height (Inches)	Mean (SD)	67.4 (4)	
	Median (IQ 25, 75)	67 (65, 70)	
BMI	Mean (SD)	32.8 (7)	
	Median (IQ 25, 75)	32 (28, 37.5)	
	Below 18.5	2 (1.8)	<0.05
	18.5-24.9	10 (9)	
	25-29.9	29 (26.1)	
	30-34.5	33 (29.7)	
	>35	37 (33.3)	

Table2. Demonstrating measurements noted by two blinded radiologists and average of both radiologists.

Measurements (mm)		Mean (SD)	Median (IQ 25, 75)	Maximum
Radiologist 1 readings	Distance above the patella/suprapatellar bursa	34.8 (8.9)	34 (27.5, 40.5)	60
	Distance from skin through cortex	38.9 (7.1)	38 (34.1, 43.2)	58.3
Radiologist 2 readings	Distance above the patella/suprapatellar bursa	35 (9.4)	34 (27.2, 41)	61
	Distance from skin through cortex	38.8 (7.5)	38.3 (34.0, 43.9)	55.1
Average of both the radiologist	Distance above the patella/suprapatellar bursa	35 (9.2)	34.5 (27.2, 40.5)	60.5
	Distance from skin through cortex	38.8 (7.3)	38.2 (34.0, 43.3)	55.1



Graph 1. Showing relation between median BMI and distance from skin through cortex to adequately insert the IO.

No, authors do not have interests to disclose

EMF 459

Blood and MRI Biomarkers in Acute Concussion to Identify Blood-Brain Barrier Dysfunction

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Study Objectives: Traumatic brain injury (TBI) results in over 2.5 million U.S. emergency department (ED) visits every year, leading to a massive public health burden. 90% of these visits are due to cases of mild TBI, or concussion. Recovery after concussion is extremely variable, ranging from complete symptom resolution within days to a prolonged course of symptoms that can cause disability for years. However, no accurate method exists to identify people most at-risk for persistent symptoms or cognitive dysfunction early after concussion. One potential pathology underlying variation in TBI recovery is blood-brain barrier (BBB) dysfunction (permeability). BBB dysfunction has been reported after severe or complex TBI and repetitive head trauma, but it remains unclear if BBB dysfunction is present acutely after a single concussion. Detecting BBB dysfunction after concussion could illuminate pathophysiology, improve prognostication, and identify novel treatment targets. We sought to quantify and localize BBB permeability in patients with a single, acute concussion using dynamic contrast-enhanced magnetic resonance imaging (MRI) and evaluate the association with neurovascular-related blood biomarkers (vascular cell adhesion molecule [VCAM] and intercellular adhesion molecule [ICAM]). We hypothesized that MRI-measured BBB permeability and neurovascular blood biomarker levels are higher in patients with acute concussion vs healthy controls.

Methods: In this prospective cohort study, we enrolled 10 adult patients in the ED diagnosed with concussion (mean age 34 y, 70% female) and 8 healthy controls (mean age 28 y, 50% female). Blood samples were collected in the ED at time of enrollment. Within 14 days post-injury (median 4.5, range 0-14 days), we performed brain dynamic contrast-enhanced MRI (3T Siemens Prisma system). To measure BBB permeability, we calculated K^{trans} (transfer constant) – the delivery rate of contrast agent to the brain per tissue volume and per contrast agent concentration in arterial blood. Threshold-free cluster enhancement was used to identify contiguous high-signal voxel clusters. Voxel-

wise K^{trans} comparisons were conducted between concussion vs control groups, with age and sex as covariates, via permutation testing (n=2000) controlling family-wise error rate. Serum levels of VCAM and ICAM were measured in batch using Luminex immunoassays. Lab personnel were blinded to subject injury status.

Results: MRI analysis revealed the highest difference regional cluster between concussion vs controls was in left temporal lobe (K^{trans} median difference of 3.1 $x10^{-3}$ arbitrary units, 95% CI 1.2-13.8 $x10^{-3}$ p=0.009 by Mann-Whitney test). Five concussion subjects had K^{trans} cluster levels higher than all controls. Serum analysis showed VCAM and ICAM levels were not correlated with K^{trans} in this brain region and were similar between concussion vs control groups.

Conclusion: Our data suggest MRI-measured BBB dysfunction is present in a substantial proportion (50%) of subjects with acute concussion. Ongoing work will investigate relationships between BBB permeability, serial blood biomarkers, and 30-day symptom and cognitive measures.

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No, authors do not have interests to disclose

460 The Impact of Category 3 Trauma Activations on Diagnosis and Treatment of Traumatic Intracranial Hemorrhage

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Study Objectives: Traumatic injuries to the head are one of the most common types of traumatic injury to present to the emergency department (ED). Delayed detection and treatment of traumatic intracranial hemorrhage (tICH) is associated with poorer prognoses. Trauma activations (TA), with criteria determined independently by institutions following specialty guidance, serve to expedite diagnosis and treatment in injured patients. However, many of these patients do not meet the criteria for TA, often due to low-intensity mechanisms. To better serve this population and responsibly leverage resources, a level 3 TA was created to support patients with the potential for serious clinical conditions not meeting TA criteria. This study aimed to determine if the level 3 TA improves the length of time required for the diagnosis and treatment of tICH.

Methods: This was a retrospective evaluation of patients who presented to an urban level 1 trauma center from November 2020 to December 2021 and were diagnosed with a tICH. Data were abstracted from the medical record, including demographic, injury, clinical, and outcome variables. Patients were categorized as having a level 1 or 2 TA, level 3 TA, or trauma evaluation (TE). Time to diagnosis was defined as time to computed tomography report, and time to treatment was defined as time to anti-seizure prophylaxis, blood pressure reduction, mannitol, steroids, hypertonic saline, or anticoagulation reversal.

Results: A total of 150 patient encounters were included. Patients tended to be white (82%), male (63%), and on Medicare (48%) with a median age of 62 years. Falls were the most common mechanism of injury in all groups. Subdural (61%) and subarachnoid (57%) hemorrhage were the most common diagnoses across all groups. Compared to patients who did not receive an activation, the TE group, patients who had a TA3 had significantly faster diagnosis (p=0.006) and treatment (p=0.01). Additionally, there was no difference in time to diagnosis between TA3 and TA1/2 (p=0.07).

Conclusion: By creating a mechanism to expedite care for at-risk patients who do not meet the criteria for a full or partial trauma activation time, we sought to improve the time to patient diagnosis and subsequent treatment. We found that patients who had TA3 received a diagnosis as early as patients who were TA1/2 and had both a diagnosis and necessary treatment significantly faster than those who had a standard emergency department triage with no activation.

No, authors do not have interests to disclose

462 WITHDRAWN

463 A Predictive Nomogram-Based Model for Lower Extremity Compartment Syndrome After Trauma

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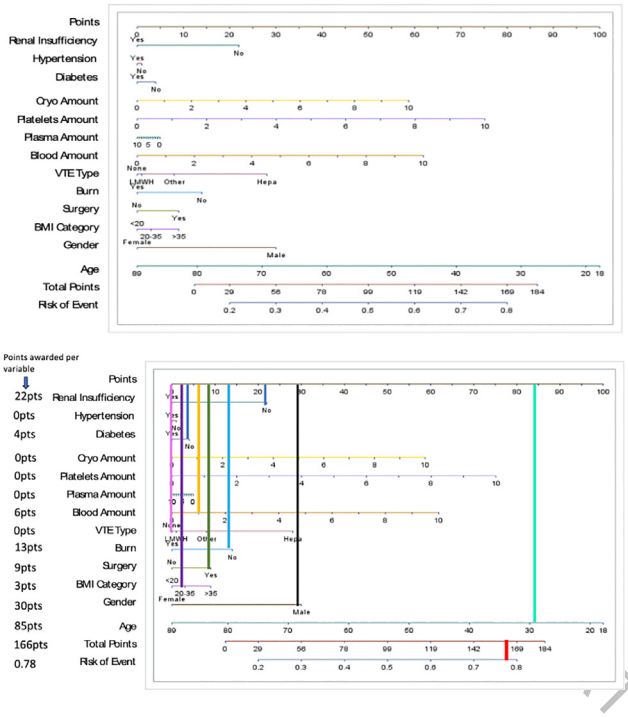
Background and Study Objectives: Acute Compartment Syndrome (ACS) of the extremities, is one of the few emergent life and limb threatening conditions that can rapidly progress in the emergency department, while being correctable if detected early. The condition arises most frequently after extensive soft tissue injury or extremity bone fractures. The lower extremities are implicated in a large percentage of ACS cases. ACS has a very a narrow timeframe to recognize and address surgically, to prevent tissue necrosis and permanent tissue injury. Established risk factors are limited to general conditions such as age, sex, extremity fracture, and fracture classification. If further risk factors were determined, trauma specific risk calculators could be established; and in turn, increase surveillance in high-risk patients and decreasing diagnosis times of ACS. Our objectives are to evaluate risk factors for lower extremity compartment syndrome after traumatic bone fracture, as well as establish a risk calculator for ACS following lower extremity trauma.

Methods: This study employs a large retrospective case control analysis using data gathered from the American College of Surgeons Trauma Quality Improvement Program database. Using this data, risk factors associated with developing ACS following lower extremity fractures were extracted. Multivariable regression was used to identify significant risk factors and subsequently, these variables were implemented in a normogram as a predictive model for developing ACS.

Results: Several risk factors for ACS were found to have increased odds ratios including high body mass index, male sex, whether surgery occurred, and young age. Novel risk factors identified in this study, yet not apparent in the literature include DVT prophylaxis type particularly unfractionated heparin use (OR 2.67, 95% CI 2.33- 3.05, P<0.0001) , blood and platelet transfusions (blood per unit, OR 1.13, 95% CI 1.09-1.18, P<0.0001), (platelets per unit OR 1.16, 95% CI 1.09-1.24, P<0.0001), as well as cryoprecipitate infusions (cryoprecipitate per unit, OR 1.13, 95% CI 1.09-1.22, P<0.0031).

Conclusion: This study shows evidence that Heparin use and blood product transfusions may be additional risk factors to evaluate when considering methods of risk stratification of lower extremity ACS. We propose a nomogram of variables for use as a risk calculator to estimate overall risk for ACS after lower extremity fractures.

Fig 1 and 2 Predictive Nomogram and Worked Example



No, authors do not have interests to disclose

464 Epidemiology and Risk Factors for Intentional Traumatic Brain Injury

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Study Objectives: Violence and traumatic brain injury (TBI) are now clearly recognized as major public health concerns worldwide. Intentional injury due to violent acts is associated with significant morbidity and mortality. However, intentional TBI has received little attention and there is limited research on the relationship of injury intent to injury mechanism, severity, mortality, hospital disposition and demographic factors. This study aimed to examine the factors associated with intentional TBI and evaluate the differences in outcomes based on injury intent.

Methods: We conducted a retrospective analysis of patients with diagnosed TBI at an urban trauma center. Hospital data was obtained from the Department of Surgery's trauma registry, a subset of the National Trauma Registry of the American College of Surgeons (NTRACS), for the years 2017-2022. Registry complaint was used to assess for injuries that were caused unintentionally, were the result of an assault or were self-inflicted. Intentional and unintentional TBI patients were compared using descriptive, univariate and multivariate methods.

Results: This study identified 123 (9%) intentional TBIs and 1,203 (91%) unintentional TBIs. Of the intentional TBIs, only 3 were self-inflicted. Approximately 82% of the unintentional TBIs were due to falls. Younger age, male gender, minority status, Medicaid coverage, alcohol use and the lack of orthopedic injury were associated with intentional TBI. Patients with intentional TBI were more likely to be discharged to home and with admission had shorter hospital lengths of stay and were less likely to be discharged to rehabilitation. No association was found between intentionality and death, TBI severity, injury severity score, ventilator usage, intensive care unit days or in-hospital complications. Multivariate analysis found that Black race and alcohol use near the time of injury were predictive of intentional injury when adjusting for other demographic variables.

Conclusion: Overall, patients with intentional TBI had less severe and more focal injury events with shorter hospital lengths of stay if admitted. Multiple demographic and injury related variables were associated with intentional TBI. Targeted prevention programs should be designed to reduce injury in this vulnerable population. Further study is needed to evaluate long-term patient outcomes and re-injury after intentional TBI.

No, authors do not have interests to disclose

465 Outcomes of a Single Head CT in Emergency Department Patients With Minor Head Trauma on Anticoagulants and Antiplatelet Medications

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Study Objective: Increasingly emergency physicians treat elderly patients on antiplatelet therapy (APT), vitamin K antagonist (VKA), or nonvitamin K antagonist oral anticoagulant (NOAC) medications with minor head injury (MHI). We studied the safety of discharging adult ED patients on APT, VKA, NOAC medications with MHI after a single head CT (HCT) without a period of observation or repeat HCT and how many returned within 30 days with delayed hemorrhage (DH). In May 2023, Valente et al. and ACEP published, "Clinical Policy: Critical Issues in the Management of Adult Patients Presenting to the Emergency Department With Mild Traumatic Brain Injury." We present data from our institution's discharging adult patients taking APT, VKA or NOAC with MHI after a single (HCT) supporting ACEP's recommendation that this is safe and adding lacking data that discharging patients on APT with MHI after a single HCT is also safe.

Methods: This is a retrospective chart review at a level one trauma and comprehensive stroke center in central New Jersey with 73,000 ED visits per year. Research students searched ED electronic medical records (EMR) from 2007-2017 for adult patients (age $>$ 21), with minor head injury (GCS 14-15) while taking APT, VKA, or NOAC, discharged from the ED after a single head CT. Students recorded age, gender, APT, VKA, NOAC use, international normalization ratio (INR) and platelet count (PLT) if available, alcohol or drug use, mechanism of injury, and loss of consciousness (LOC). As the trauma and stroke center for our area, assuming any significant DH would return to our hospital, students searched ED and hospital EMR for return visits within 30 days of ED discharge, recording any neuroimaging with intracranial hemorrhage (ICH). This study began as a pilot study with 150 subjects, after none returned with DH, a power calculation found we needed 500 patients for sufficient power in case of finding no DH. Data collection was delayed due to COVID. A change in EMR at our institution prevented reaching our goal of 500 subjects. Means and standard deviations (SD) summarized age. Counts and percentages summarized all other variables. Based on continuous, categorical, or ordinal variables and cell count, Analysis of Variance (ANOVA), Pearson chi-square tests, exact chi-square tests, and Cochran-Mantel-Haenszel tests determined if variables differed for return visits.

Results: 464 subjects were included. 221 (47.6%) were male with mean age 77.1 (SD 14.1). 390 (84.1%) presented after fall, 66 (14.2%) after motor vehicle collision, 8 (1.7%) after other mechanism. 8 (1.7%) had loss of consciousness, 7 (1.5%) alcohol or other drug use. 172 (37.1%) took aspirin (ASA), 210 (45.3%) clopidogrel, 235 (50.7%) warfarin, 24 (5.2%) NOAC. 99 (21.3%) took ASA and clopidogrel and 67 (14.4%) took APT and VKA or NOAC. INR values were available in 170 (36.6%) subjects, with values $<$1, 21 (4.5%), 1-2, 86 (18.5%), 2-3, 56 (12.1%), 3-4, 24 (5.2%), $>$ 4, 7 (1.5%). PLT was available in 179 (38.6%) subjects, with values $<$ 100, 6 (1.3%), 100-200, 84 (18.1%), 200-300, 68 (14.7%), 300-400, 17 (3.7%), $>$400, 4 (0.9%). 63 (13.6%) subjects returned. 34 (54.0%) were male with mean age 75.5 (SD 12.2). No variable was significantly associated with return visit (p values $>$ 0.05). No subject returned with delayed hemorrhage.

Conclusion: Our data support ACEP's clinical policy recommendation that discharging adult patients with MHI on APT, VKA, or NOAC is safe.

No, authors do not have interests to disclose

467 The Impact of Police vs EMS Transport on Mortality in Trauma Victims: A Systematic Review and Meta-Analysis

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Background: Transport of blunt and penetrating trauma patients by police has been steadily increasing over recent years. Police transport (PT) of trauma victims operates with the goal of promptly delivering patients to the nearest trauma center with minimal prehospital medical care, thus utilizing a "scoop and run approach". In contrast, emergency medical services (EMS) typically perform prehospital interventions on-site before transporting trauma patients to the hospital. This systematic review and meta-analysis evaluate the odds of mortality and surgical interventions of EMS versus PT transports.

Methods: The PubMed database was searched from its inception through March 2024. Random effects meta-analyses were used to assess the odds of mortality and the need of surgical interventions for PT versus EMS transport. Funnel plot, Q-statistics, and I2 values were used to assess publication bias, and heterogeneity respectively.

Results: The search yielded 13 observational retrospective studies, including 143,497 patients. Of these patients, 118,797 (83%) were male. The EMS group involved 130,107 patients (91%), and PT had 13,390 patients (9.4%). The mean (+/- SD) ISS score was not significantly different between the 2 groups, [EMS 13.4 ($\pm$ 4) vs PT 15 ($\pm$5), P=0.31]. EMS transport was associated with increased odds of mortality (OR 1.46, 95% CI 1.04-2.06, P$<$0.001, I2 = 65%), but no increased odds of surgical intervention (OR 1.16, 95% CI 0.67-2.04, P=0.08, I2=67%) compared to the PT group. The funnel plot showed the symmetrical distribution of studies for odds of mortality, suggesting no publication bias.

Conclusion: Based on our findings, EMS transport has higher odds of mortality versus police transport. Further research should investigate factors that can influence the survival of trauma patients who are transported to the emergency department by EMS and/or police.

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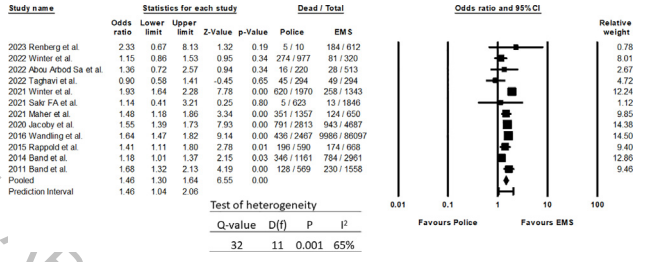

Study name	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value	Police	EMS	Relative weight
2023 Renberg et al.	2.33	0.67	8.13	1.32	0.19	5 / 10	184 / 612	0.78
2022 Winter et al.	1.15	0.86	1.53	0.95	0.34	274 / 977	81 / 320	8.01
2022 Abou Arbod Sa et al.	1.36	0.72	2.57	0.94	0.34	16 / 220	28 / 513	2.67
2022 Taghavi et al.	0.90	0.58	1.41	-0.45	0.65	45 / 294	49 / 294	4.72
2021 Winter et al.	1.93	1.64	2.28	7.78	0.00	620 / 1970	258 / 1343	12.24
2021 Sakr FA et al.	1.14	0.41	3.21	0.25	0.80	5 / 623	13 / 1846	1.12
2021 Maher et al.	1.48	1.18	1.86	3.34	0.00	351 / 1357	124 / 650	9.85
2020 Jacoby et al.	1.55	1.39	1.73	7.93	0.00	791 / 2813	943 / 4687	14.38
2016 Wandling et al.	1.64	1.47	1.82	9.14	0.00	436 / 2467	9986 / 86097	14.50
2015 Rappold et al.	1.41	1.11	1.80	2.78	0.01	196 / 590	174 / 668	9.40
2014 Band et al.	1.18	1.01	1.37	2.15	0.03	346 / 1161	784 / 2961	12.86
2011 Band et al.	1.68	1.32	2.13	4.19	0.00	128 / 569	230 / 1558	9.46
Pooled	1.46	1.30	1.64	6.55	0.00			
Prediction Interval	1.46	1.04	2.06					

Test of heterogeneity

Q-value	D(f)	P	I²
32	11	0.001	65%

No, authors do not have interests to disclose

468 Current Stance on Focused Cardiac Ultrasound (FOCUS) for Suspected Aortic Dissection by Physicians in Mid-Atlantic Emergency Departments

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Study Objectives: Focused cardiac ultrasound (FOCUS) for workup of suspected type A aortic dissection (AAD) has become an increasingly popular topic of discussion, however, there is not widespread use of the technique. In this study, we surveyed emergency doctors' usage and views regarding FOCUS. Additionally, we set out to evaluate if a manual highlighting data and ultrasound views from the literature would increase comfort with the technique.

Methods: We surveyed attending emergency physicians across 9 emergency departments (EDs). Questions about the technique pre/post survey were evaluated on a 1-10 point Likert scale. Participation was anonymous and consent was implied by participation in the survey. Georgetown IRB #00006576.

Results: *Demographics:* 37 physicians responded. 5 incomplete responses were excluded. The average number of years as an attending was 10 (Figure 1A). *Awareness and Usage (pre-manual):* 87.5% (28/32) of participants reported being aware that FOCUS can be used to aid in the diagnosis of AAD (Figure 1B). 62.5% (20/32) of respondents reported having used it to work up at least one patient in the past (Figure 1C). Of those who had used it before (previous users), 70% (14/20) stated that they would use FOCUS again on their next suspected AAD patient (Figure 1D). *Comfort with Literature (pre-manual):* Those who had never used the technique before (never-users) who were aware of the technique rated their comfort with the literature as 2.9/10 (Figure 2A). Previous users rated their comfort in the literature as 5.9/10 (Figure 2A). The comfort of previous users who reported that they would use it on their next suspected AAD patient was significantly higher than previous users who said they would not (6.9/10 vs 3.5/10) (Figure 2B). *Comfort with Performance (pre-manual):* When asked about comfort performing FOCUS, previous users reported an average score of 5.2/10 (Figure 2C). Previous users who said they would use FOCUS on their next suspected AAD patient, reported a comfort of 6.3/10 (Figure 2D). Previous users who said they would not use it on their next suspected AAD patient reported a significantly lower score of 2.7/10 (Figure 2D). When asked about comfort with teaching FOCUS to other doctors, previous users gave an average rating of 4.6/10 (Figure 2E). *Manual Significantly Increased Comfort:* After answering questions on previous usage and comfort, participants read the manual made by our ultrasound teaching team (Figure S1). After reading, the average comfort of all participants increased from 3.4/10 to 5.6/10 (Figure 3A). Never-users rated their comfort as 3.9/10 post-manual (Figure 3B). We also saw a comfort increase in previous users (Figure 3C). Participants were asked if they would use FOCUS to help work up the next suspected AAD patient they encountered before and after reading the manual. We saw a significant increase from 53.1% (17/32) pre-manual to 68.8% (22/32) post-manual (Figure 3D) in all participants. The likelihood of usage by never-users increased to 33.3% (4/12) post-manual and 85% (17/20) in previous users (Figure 3E-F).

Conclusion: To our knowledge, this is the first study to survey emergency doctors about FOCUS for AAD. We found that while knowledge about the technique is widespread, utilization is lagging. This may be due to a low level of comfort in the literature and in the ability to teach other doctors. We found that a manual highlighting data and ultrasound views increases comfort and willingness to use FOCUS. We believe that there is a need for high-fidelity simulation to boost the comfort of current operators. Overall, our study uncovers barriers to utilization while offering up a possible intervention to boost comfort and willingness to use the technique.

Figure 1. Demographics and Usage

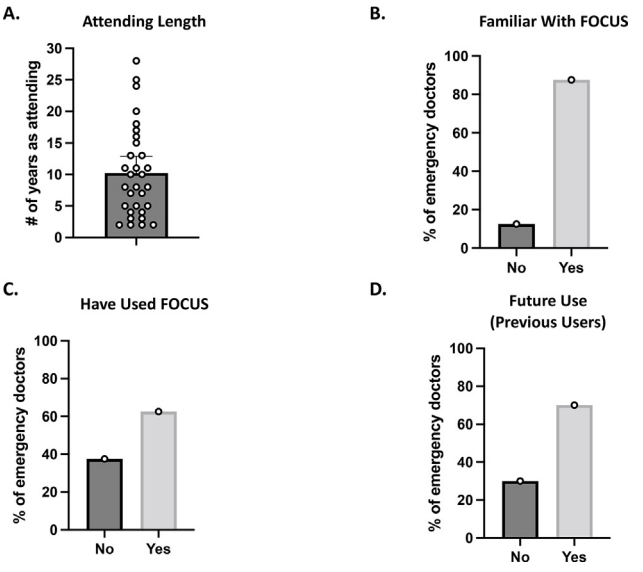


Figure 2. Comfort

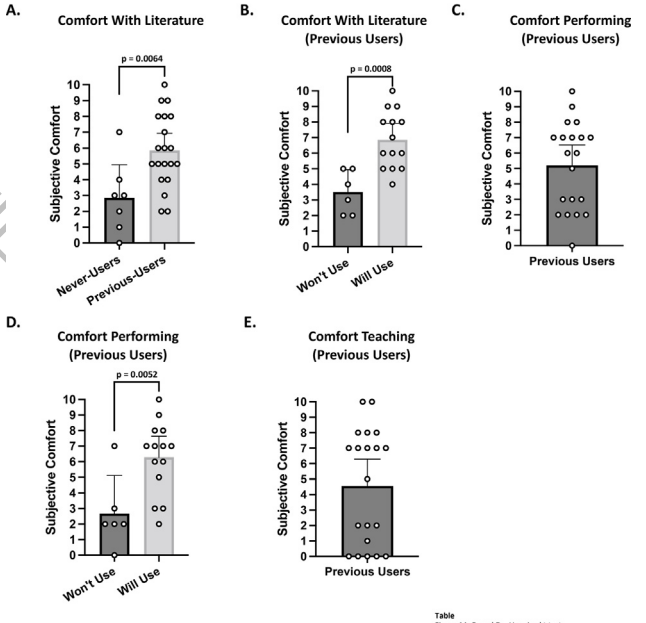


Table
Figure 1A, B, and D = Unpaired t test
Bars = 95% CI

Figure 3. Effect of Manual

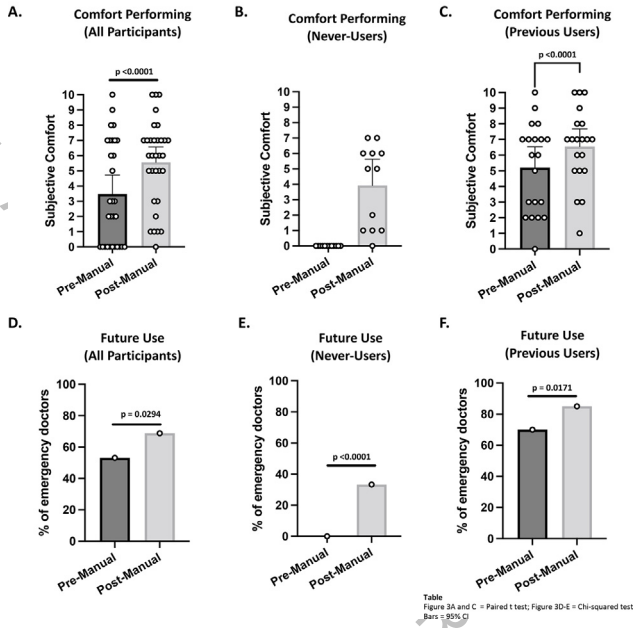


Table
Figure 3A and C = Paired t test; Figure 3D-E = Chi-squared test
Bars = 95% CI

Supplemental Figure 1

FOCUS to aid in the diagnosis of aortic dissection – a short manual

Background

Computed tomography (CT) is the most commonly used image modality for the diagnosis of type A aortic dissection (AAD).[1] With a sensitivity of 96.2% and a specificity of 96.4%, CT is a robust and capable system for the diagnosis of AAD, however, it is relatively slow and sometimes impractical for patients who are not hemodynamically stable.[2] The in-hospital mortality for AAD is 22%, with the highest mortality occurring early after symptom onset, suggesting that increasing the speed of intervention could have a robust impact on survival.[3] Therefore, there may be a need for a more rapidly deployable bedside method of diagnosing AAD.

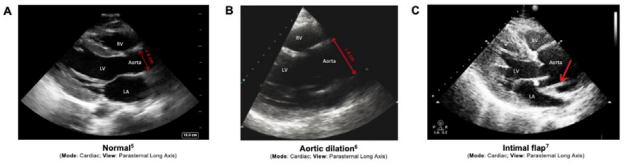
Focused Cardiac Ultrasound (FOCUS) to aid in the diagnosis of AAD has become an increasing topic of discussion in the literature. In April 2023, Sutarjono and colleagues compiled 14 studies in a meta-analysis, looking at the use of ultrasound for the diagnosis of AAD spanning 9602 sonographic examinations.[4] They found that FOCUS is a powerful way of working up suspected AAD patients **(Table 1)**.[4] Of the views included in the meta-analysis, the presence of an intimal flap on FOCUS carried the most positive diagnostic weight due to its high specificity **(Table 1, Figure 1C)**.[4] Using the data from their paper, we put together this short manual which includes indicated ultrasound views and a potential framework for the use of FOCUS in the emergency department.

Table 1

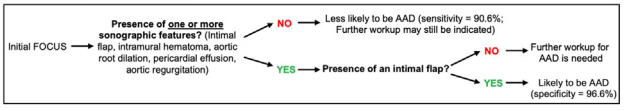
Sonographic feature	Sensitivity[4]	Specificity[4]	Diagnostic odds ratio[4]
Any one sonographic feature (intimal flap, intramural hematoma, aortic root dilation, pericardial effusion, or aortic regurgitation)	90.6%	87.5%	25.2
Intimal Flap	68.7%	96.6%	61.9

Indicated views

Figure 1



Potential FOCUS Framework



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No, authors do not have interests to disclose

469 An Analysis of Common Errors in Biliary Point-of-Care Ultrasound

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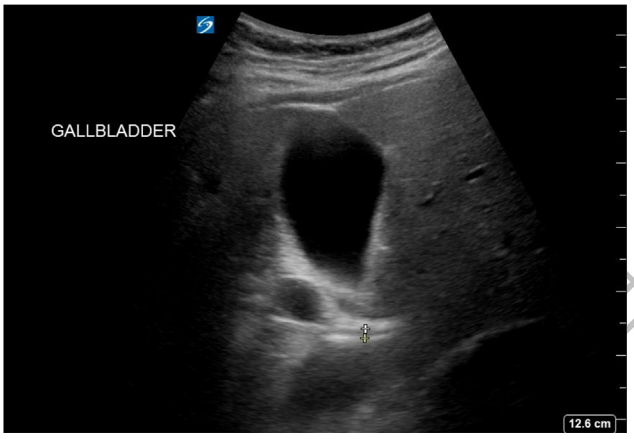
Study Objectives: Prior work has demonstrated that emergency physicians can diagnose cholelithiasis and cholecystitis with point-of-care ultrasound (POCUS) with high accuracy. However, ultrasound (US) is a user-dependent technology, and so emergency medicine (EM) residents with less experience may not necessarily achieve high accuracy with biliary POCUS. With that being said, no prior studies have systematically attempted to determine the most common errors made by trainees performing biliary POCUS. Therefore, in order to better focus future education efforts, we performed a retrospective assessment of the quality of biliary POCUS studies to determine the most common errors.

Methods: We retrospectively assessed the quality of biliary POCUS images obtained by EM residents from a single EM residency program with 21 residents. We reviewed all the biliary POCUS studies performed by EM residents from July 1, 2021 until June 30, 2022. Three experts in biliary POCUS (one emergency US fellow and two emergency US-fellowship-trained attending physicians) reviewed the images. An expert reviewer filled out a standardized data collection form for each biliary POCUS study. The data collection form prompted the reviewer to determine the adequacy of the following aspects of the POCUS: transverse gallbladder view, longitudinal gallbladder view, gallbladder neck view, gallbladder wall thickness, common bile duct size, and presence (or absence) of gallstones. The expert reviewers were also asked to report why inadequate images were deemed inadequate. For 40% of the POCUS studies assessed, a second reviewer evaluated the images to allow for an assessment of the interrater reliability. If the two reviewers disagreed on the adequacy of an image, a third reviewer adjudicated. We report the number (%) of cases in which each portion of the biliary POCUS was deemed adequate.

Results: Between July 1, 2021 and June 30, 2022, there were 200 resident-performed biliary POCUS studies. All 21 EM residents performed at least 2 biliary POCUS studies during that period; the maximum number of biliary POCUS studies performed by a resident was 31. The EM resident was successful in performing the following aspects of the biliary POCUS in the following number (%) of cases: transverse view 184 (92.0%), longitudinal view 188 (94.0%), gallbladder neck view 180 (90.0%), gallbladder wall measurement 173 (86.5%), and common bile duct measurement 122 (61.0%). One example of a resident error is shown in the Figure. Gallstones were identified in 58 cases by the resident and 63 cases by the reviewing attending (92.1% of the time the gallstones were identified). There were no cases where a resident reported the presence of a gallstone that was not seen by the reviewer.

Conclusions: The most common errors identified in EM resident-performed biliary POCUS studies were inability to correctly measure the common bile duct and failure to correctly measure the anterior wall of the gallbladder. The EM residents' images and interpretations were adequate greater than 90% of the time for other components of the biliary POCUS. These findings should help tailor the training of novice users of biliary POCUS.

Figure 1: Incorrect measurement of the common bile duct.



No, authors do not have interests to disclose

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470 Novice Point-of-Care Ultrasound for the Diagnosis of Acute Dyspnea in the Emergency Department

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Study Objectives: Dyspnea is one of the most common presentations to the emergency department (ED). While the diagnostic accuracy of POCUS for determining the etiology of dyspnea has been investigated, the prognostic value of POCUS conducted by a novice sonographer has yet to be determined. The goal of this study was to determine the diagnostic accuracy of POCUS examination completed by a medical student for several causes of dyspnea.

Methods: A prospective observational study was conducted in the ED of an urban, academic center between January 2024—April 2024. Adult patients ($\geq$ 18 yo) who presented to the emergency room with dyspnea were enrolled in the study. The study investigator was a medical student who was blinded to the clinical work up. Standardized POCUS examinations were performed following a modified BLUE protocol to identify the dyspnea etiology as one of the following diagnoses: asthma, COPD, acute heart failure, pneumonia, pulmonary embolism, pneumothorax, and non-diagnostic. POCUS diagnoses were compared to the clinical diagnosis made by the treating emergency physician. A secondary analysis compared the POCUS examination with the time to CXR.

Results: 250 patients were enrolled in the study. 99 (39.6%) patients were male, and 136 (54.4%) patients identified as Black. POCUS demonstrated high sensitivity and specificity for diagnosing asthma, COPD, acute heart failure, pneumonia, and pneumothorax (Table). Concordance was optimal ($0.8 < k < 1$) for the diagnosis of asthma, COPD, acute decompensated heart failure; good ($0.6 < k < 0.8$) for pneumonia and non-diagnostic; and moderate ($0.4 < k < 0.6$) for pneumothorax and pulmonary embolism. Overall concordance was optimal ($k = 0.84$). The mean time it took to complete a POCUS scan in this study was 10.4 minutes, compared to the 102.1 minutes it took, on average, to obtain a CXR. The time to POCUS diagnosis was significantly shorter than the time it took to obtain a CXR ($P<0.0001$).

Conclusion: POCUS examinations completed by a medical student demonstrated acceptable diagnostic accuracy for asthma, COPD, acute heart failure, and pneumonia. Medical student POCUS examinations could be used for risk stratification to identify patients that require additional diagnostic imaging. Future work should replicate this study with additional medical students to assess for inter-user variability.

Table 1: Diagnostic accuracy of POCUS compared to clinical diagnosis for the dyspnea patient.

Primary Diagnosis	Sensitivity, % (95% CI)	Specificity, % (95% CI)	PPV, % (95% CI)	NPV, % (95% CI)	+ LR (95% CI)	—LR (95% CI)	Accuracy, % (95% CI)	*K* value
Asthma	86.36 (65.09—97.09)	99.12 (96.87—99.89)	90.48 (70.3—97.44)	98.69 (96.34—99.54)	98.45 (24.53—395.2)	0.14 (0.05—0.39)	98 (95.39—99.35)	0.87
COPD	90.91 (78.33—97.47)	98.06 (95.1—99.47)	90.91 (79.05—96.36)	98.06 (95.2—99.23)	46.82 (17.66—124.11)	0.09 (0.04—0.24)	96.8 (93.79—98.61)	0.88
Acute Heart Failure	81.25 (63.56—92.79)	99.08 (96.73—99.89)	92.86 (76.41—98.12)	97.30 (94.59—98.67)	88.56 (22.07—355.41)	0.19 (0.09—0.39)	96.8 (93.79—98.61)	0.85
Pneumonia	80.0 (59.3—93.17)	97.33 (94.29—99.02)	76.92 (59.64—88.26)	97.77 (95.24—98.97)	30.0 (13.3—67.67)	0.21 (0.09—0.45)	95.6 (92.26—97.78)	0.76
Pulmonary embolism	60.0 (14.66—94.73)	99.18 (97.08—99.9)	60.0 (24.06—87.66)	99.18 (97.65—99.72)	73.50 (15.53—347.9)	0.40 (0.14—1.18)	98.4 (95.95—99.56)	0.49
Pneumothorax	100.0 (2.5—100)	99.2 (97.13—99.9)	33.33 (11.17—66.53)	100.0 (98.52—100)	124.5 (31.31—495.05)	0.0	99.2 (97.14—99.9)	0.59
Non-diagnostic	83.47 (75.63—89.6)	93.02 (87.17—96.76)	91.82 (85.6—95.49)	85.71 (80.04—89.98)	11.96 (6.34—22.58)	0.18 (0.12—0.27)	88.4 (83.77—92.09)	0.78

No, authors do not have interests to disclose

471 Retrospective Analysis on the Current Use of Bedside Ultrasound in the Diagnosis of Acute Heart Failure in the Emergency Department

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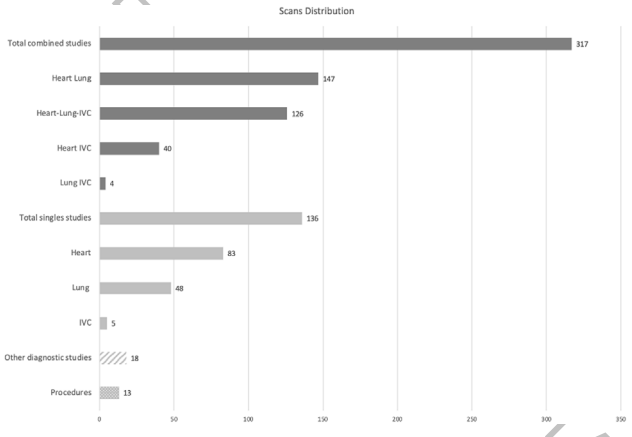
Study Objectives: This study aimed to evaluate the utilization patterns of point of care ultrasound (POCUS) used for diagnosing acute heart failure (AHF) in a suburban community emergency department (ED) with an emergency medicine residency where POCUS is a standard part of the residency training. Current American College of Emergency Physicians (ACEP) guidelines recommend the use of history and physical exam along with the use of lung ultrasound for the aid in diagnosis of AHF where clinical uncertainty is present.

Methods: We performed a retrospective cohort study across three EDs, analyzing adult patient visits with an ED diagnosis of AHF between January 1, 2023, and February 21, 2024. We reviewed ED documentation for the use of POCUS in patient care and included patients with BNP > 500 pg/ml. We then determined whether POCUS findings were used to influence medical decision making. Additionally, we compared emergency physician (EP) estimates of left ventricular ejection fraction (LVEF) from POCUS with those from cardiology-performed echocardiograms to evaluate for any agreement between them using Kappa agreement and verified agreement with Chi-squared testing.

Results: Out of 3,110 ED visits for AHF visits, 1,560 (50.42%, 95% CI [48.66%,52.18%]) had BNP levels above 500 pg/ml. Among these patients, 484 (30.87%, 95% CI [28.58%,33.25%]) underwent POCUS. The most common combination of POCUS studies was cardiac and lung ultrasound, performed in 30.37% (95% CI [26.28%,34.47%]) of cases. Cardiac, lung and inferior vena cava (IVC) was the second most common combination, performed in 26.03% (95% CI [22.12%,29.94%]). Out of the 136 single scan studies, cardiac POCUS was the most common, with 17.15% (95% CI [13.79%,20.51%]) of the cases. The second most common single scan study was lung ultrasound with 9.92% (95% CI [7.25%,12.58%]) of the cases. The secondary analysis, using Kappa and chi-squared analysis comparing 88 ED-performed LVEF estimates to cardiology-performed echocardiograms showed a kappa equal to 0.277 (95% CI [0.098, 0.0457]) showing fair to moderate agreement, we expect this number to change with the addition of 100 more cases into the analysis. ?2 analysis shows that there is a statistically significant association between ED and cardiology LVEF estimates (p=2.4x10-6).

Conclusion: Our study indicates that among those AHF admissions surveyed, heart and lung ultrasound was the most frequent POCUS study combination performed, with heart, lungs and IVC as the second most common. For single POCUS studies, cardiac POCUS was the most common, with lungs as the second most common. Based on the kappa agreement analysis, EP LVEF estimates have fair to moderate agreement to cardiology-performed echocardiogram results. These findings demonstrate that the current use of POCUS goes beyond ACEP recommendations. The combination of multiple POCUS studies adds clinical context that can potentially change management and patient outcomes. Future studies are needed to evaluate POCUS's utility, cost-effectiveness, and relevance in diagnosing and managing AHF, particularly as it compares to other diagnostic methods.



No, authors do not have interests to disclose

472 Blood Culture Contamination Rate as a Novel Way to Assess Safety of Ultrasound Guided Intravenous Catheters

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Background: The utilization of ultrasound-guided intravenous catheters (USGIV) in emergency departments has increased due to the availability of ultrasound machines. However, concerns regarding infection transmission have led to recommendations for mitigating risks, including disinfection protocols, the use of sterile ultrasound transmission gel, and sterile probe covers. Despite these recommendations, empirical evidence supporting their clinical efficacy is lacking.

Methods: To address this gap, we propose a novel approach to assess contamination in USGIV placement by monitoring contaminated blood cultures. We aim to identify patients with contaminated blood cultures, defined as one out of two cultures positive for normal skin flora. Subsequently, we will analyze whether the contaminated blood culture is linked to an intravenous catheter placed using ultrasound or traditional landmark techniques.

Results: This approach allows for the exploration of the effects and benefits of different cleaning protocols. The population with presumed contaminated blood cultures is substantially larger than those experiencing infections from peripheral IV placement, making it a valuable metric for evaluating cleaning protocols' impact.

Conclusion: Evaluating contamination in USGIV placement through monitoring contaminated blood cultures offers a unique perspective on infection risks. This study could provide valuable insights into the efficacy of current cleaning protocols and guide future practices in USGIV placement to minimize infection transmission risks.

No, authors do not have interests to disclose

473 Seeing Clearly: Can Emergency Physicians Use Point-of-Care Ultrasound to Identify Mac-on vs Mac-off Retinal Detachment?

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Study Objectives: Early detection of Retinal Detachment (RD) can significantly enhance the success rate of retinal reattachment procedures and visual outcomes, particularly prior to macular involvement. Early detection of RD requires ophthalmologists to examine the entire retina through a dilated fundus. Initial identification of RD poses clinical challenges due to its propensity to commence as minor detachments at the peripheral retina. Point-of-care ocular ultrasound has proven to be a reliable diagnostic modality for the prompt assessment of suspected RD. Numerous studies have validated its high sensitivity and specificity in accurately detecting RD using Point-of-Care (POC) Ultrasound. The aim of this study is to evaluate the ability of emergency physicians to detect the status of the macula on point-of-care ultrasound images in patients presenting with RD.

Methods: This study was conducted at an academic university medical center with two emergency medicine residency programs and an advanced emergency medicine ultrasound (AEMUS) fellowship. Participants received didactic tutorial sessions focusing on distinguishing posterior vitreous detachments and retinal detachments. A tutorial covering diagnostic subtleties of macula-on and macula-off retinal detachments, posterior vitreous detachment pathology, and ocular anatomy was provided two weeks before the assessment. Subjects were presented with ocular ultrasound video clips along with a clinical scenario and asked to discern between normal, posterior vitreous detachment (PVD), macula-on RD, or macula-off RD. Additionally, participants completed a survey on their training background, experience in performing point-of-care ocular ultrasounds, confidence levels in distinguishing RD and PVD, and the need for further ocular ultrasound education.

Results: A total of twenty-eight ocular ultrasound video clips were reviewed by forty-eight emergency physicians with varying point-of-care ocular ultrasound experience. Twenty-seven physicians had performed 0-25 POC ocular ultrasounds, six physicians had performed 26-50 POC ocular ultrasound and sixteen physicians had performed greater than 50 POC ocular ultrasounds. Physicians accurately diagnosed the presence of RD 70% (95% CI, 64-76.1) of the time and demonstrated 68% (95% CI, 59-76.6) accuracy in diagnosing Mac-off RD and a 75.3% (95% CI, 69-81.4) accuracy in diagnosing Mac-on RD. Furthermore, their accuracy was 86.6% (95% CI, 80.9-92.3) in identifying PVD and 96.3% (95% CI, 92-100) accuracy in discerning normal ultrasounds. There was a significant difference in diagnostic accuracy between residents and ultrasound faculty. Residents had a mean diagnosis accuracy of 59.81% (SD=20.42), significantly lower than the ultrasound faculty's mean accuracy of 83.00% (SD=13.44). There was no statistically significant relationship between the accuracy of detecting abnormalities and the number of previous ocular ultrasounds performed by emergency physicians.

Conclusions: Emergency physicians demonstrated modest accuracy in distinguishing macular-on and macula-off RD from PVD on point-of-care ocular ultrasound.

No, authors do not have interests to disclose

474 The Impact of Prehospital Ultrasound Training on Paramedic Simulated Clinical Decision Making

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Study Objectives: This study aimed to investigate the impact of a 13-hour prehospital ultrasound training course on the simulated clinical decision making and confidence of paramedics through pre and post training written clinical scenarios. The study also aimed to evaluate the effect of the course on paramedic competence in acquisition, interpretation and application of selected focused ultrasound exams.

Methods: The ultrasound competence of 31 participants was evaluated using post-course written and practical assessments. Written clinical decision scenarios were administered pre- and post-training. Post-training scenarios included an uninterpreted ultrasound clip to aid decision making. Scenarios included extended focused assessment with sonography in trauma (eFAST), pulmonary, and focused echocardiography/point-of-care ultrasound (POCUS) pulse check exams.

Results: Training yielded a statistically significant increase in both mean scenario score and mean participant self-confidence, across all exam/decision types assessed ($p=<0.001$). The focused pulmonary exam yielded the largest increase in both mean score improvement (59.68%) and paramedic confidence in their decisions (24.07%).

Conclusions: Trained paramedics can perform focused ultrasound exams, and accurately interpret and apply actionable exam findings in the context of written scenarios. Analysis through our model characterized the theoretical clinical yield of each prehospital ultrasound exam and demonstrated how each exam may provide improved decision accuracy in several specific simulated clinical contexts. These results provide support for growing evidence that focused limited-scope ultrasound may be an effective prehospital diagnostic tool in the hands of trained paramedics.

No, authors do not have interests to disclose

475 Sono-Starters: A Qualitative Study of Pioneers in the Field of Point-of-Care Ultrasound

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Study Objectives: The establishment of point-of-care ultrasound (POCUS) as an important field of study within emergency medicine was in large part driven by early POCUS pioneers. An understanding of their experiences and strategies may help inform future directions for POCUS outside of emergency medicine, as well as strategies for other emerging disciplines in emergency medicine. We sought to explore the perspectives of national POCUS pioneers, focusing on the experiences, motivations, and attributes that influenced their career development.

Methods: This was a prospective, qualitative study using semi-structured interviews from January-March 2022. We used purposive sampling to identify national POCUS pioneers who were diverse in gender, geographic location, and leadership roles. Two researchers independently analyzed interview transcripts. All discrepancies were resolved through discussion and negotiated consensus. We used a constructivist-interpretivist paradigm to guide our thematic analysis.

Results: We interviewed 12 POCUS pioneers. We identified major themes in 3 categories: career development, individual behaviors that promote success, and national organizations fostering advancement. POCUS pioneers identified several motivators for career advancement, including mentorship, need for representation, and ability to impact a new and important field. Most careers involved work in

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research, administration, or education. All had to overcome barriers such as the lack of acceptance within the field, political battles, lack of funding, and rudimentary technology. POCUS pioneers identified several individual behaviors that they found instrumental to their accomplishments including a strong work ethic, communication skills, and investment in the next generation. Finally, they also found that national organizations fostered career advancement through relationship building which lead to opportunities to achieve accomplishments on a large or national scale.

Conclusions: This study identified shared experiences in career development, successful individual behaviors, and how national organizations fostered career advancement. These results can inform career decisions of junior faculty interested in POCUS and how national POCUS organizations may continue to support and advance the field and their constituents.

No, authors do not have interests to disclose

476 The Supra-Short Ultrasound Protocol to Assess for Rotator Cuff Tears in the Emergency Department: A Pilot Trial

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Study Objectives: Patients who present to the emergency department (ED) with shoulder pain are often given a diagnosis of "shoulder pain" if an x-ray does not reveal the diagnosis. Such patients are often referred for outpatient magnetic resonance imaging (MRI), which is expensive and, for some patients, difficult to get. Ultrasound is readily available in the ED and known to be as accurate as MRI for the diagnosis of rotator cuff tears. However, point-of-care ultrasound is rarely used to evaluate the rotator cuff in the ED, perhaps because traditional shoulder ultrasound requires extensive training. The goal of our study was to develop and preliminarily assess the accuracy of a simplified shoulder US protocol, designed to be used in the ED for diagnosis of rotator cuff tears.

Methods: We performed a pilot study in which we preliminarily assessed the accuracy of a new shoulder ultrasound protocol for identifying rotator cuff tears. After consultation with two sports medicine physicians, we developed an abbreviated shoulder ultrasound protocol (the "supra-short" protocol) which involves obtaining just two views of the supraspinatus tendon with the patient in lateral decubitus position. The rationale for this protocol is that the supraspinatus is the most commonly torn rotator cuff tendon so assessment of only this tendon will still identify the majority of rotator cuff tears. Nine emergency physicians – 4 residents, 3 US fellows, and 2 attendings [not ultrasound fellowship-trained] – received a 60-minute training on the supra-short protocol. Nine days later, they performed the supra-short protocol on volunteers, one of whom had bilateral supraspinatus tears as diagnosed on recent MRI. A sports medicine physician also performed a complete shoulder ultrasound on the volunteers. We considered these ultrasounds to be the gold standard for volunteers who had not recently had an MRI. The supra-short ultrasound scans were observed and timed by research staff members. At the conclusion of each ultrasound, the sonographer had to indicate whether or not they thought there was a supraspinatus tear. Images were saved and individually reviewed by a sports medicine physician to determine if they were adequate to assess for a supraspinatus tear. Our primary outcome was the accuracy of the supra-short protocol as performed by the minimally trained physicians. Secondarily, we calculated the median (IQR) time to perform the supra-short ultrasound scans and the percentage of ultrasound images that were deemed adequate.

Results: The 9 emergency physicians performed a total of 80 supra-short ultrasound scans on 6 different volunteers. There were 18 cases in which the ultrasound was done on a shoulder with a known supraspinatus tear, and the emergency physicians correctly identified the tear in 12. There were 7 cases in which the emergency physician thought there was a supraspinatus tear when there was not. Thus, the sensitivity of the supra-short protocol in this study was 66.7% (95% CI 41.0 to 86.7%) and the specificity was 88.7% (95% CI 78.1 to 95.3%). The median time to complete a supra-short ultrasound was 133 seconds (IQR 88 to 182). 88.3% of the images were deemed adequate by expert review.

Conclusions: After minimal training, emergency physicians were able to learn how to obtain the views of the supra-short ultrasound protocol and performed the scans quickly. They were only able to identify supraspinatus tears with moderate accuracy, so more extensive training on identifying pathology would be needed before this protocol could be used diagnostically. Nonetheless, the supra-short protocol may provide a means by which a non-expert in musculoskeletal ultrasound may assess for rotator cuff tears, and further study is warranted.

No, authors do not have interests to disclose

EMF

478 Emergency Nurse and Physician Perspectives on Workplace Violence Strategies to Advance Workplace Safety

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Study Objectives: Emergency nurses and physicians are exposed to workplace violence events at disproportionately higher rates than clinicians in other health care settings. The purpose of this study is to identify strategies to reduce violence in emergency departments through qualitative interviews with emergency nurses and physicians at an urban, academic, Level 1 trauma center.

Methods: This qualitative study used individual in-depth and focus groups interviews to describe interventions endorsed by emergency nurses and physicians that would improve workplace violence management and workplace safety. Data collection was conducted between August 2023 and February 2024. The Social Ecological Model conceptual model guided an iterative inductive and deductive analysis of the interviews until data saturation was achieved. An interview guide was developed informed by the Social Ecological Model for in-depth and focus group interviews focused on individual clinicians' perceptions of workplace violence and safety, interpersonal experiences with workplace violence from patients, family members, colleagues or the hospital employer, and systemic health care factors related to workplace violence.

Results: In this qualitative study of n=23 emergency clinicians (n=12 nurses; n=11 physicians), clinicians were on average 38.7 years of age (SD 8.3), predominately female (13 (56.5%), with 7.7 years of experience (SD 6.8). Solutions to address workplace violence were described across five themes: 1) clinical protocols; 2) clinician conflict in addressing workplace violence 3) social vulnerability in emergency care 4) resources and throughput; 5) the presence and responsibility of security.

Conclusion: Addressing workplace violence in the emergency department must ensure that clinical protocols and security integration are equitable, that physicians are supported and protected in the context of legal health care policies (eg, Emergency Medical Treatment and Labor Act), and that hospitals are held accountable to staff nurses safely and address overcrowding as factors that exacerbate workplace violence.

No, authors do not have interests to disclose

479 The Impact of Short-term Medical Missions on the Resilience of Healthcare Students and Professionals

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Study Objective: Burnout, wellness, and resilience among healthcare professionals are notable topics in the scientific community. Compared to the general population, burnout and depression are more prevalent among medical students, residents, and young physicians. Numerous assessment tools have been developed to screen for burnout and depression among healthcare professionals, but none reviewed for this study inquired about service-learning, community service, or mission trip participation as a mitigator or factor on self-perceived burnout and resilience of healthcare students and professionals.

Methods: This cross-sectional study utilized a survey to assess healthcare students' and professionals' perceived burnout, resilience, and career satisfaction. Participants responded to an anonymous survey, and responses were collected over a 6-month period before statistical analysis was performed. Participants included healthcare students and professionals 18 years of age or older that had previously participated in a medical mission trip of any type. No other inclusion or exclusion criteria were considered. The survey was created by the researchers for this study. It focused on targeted questions about self-perceived career fulfillment and satisfaction, burnout, and resilience before and after participating in a medical mission trip. It also included questions regarding participant demographic information, mission trip location, factors influencing or motivating mission trip participation, and participants' stress-relieving activities. Questions on fulfillment

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and satisfaction, burnout, and resilience were answered on a visual analogue scale (VAS) from 0-10.

Results: Pre- versus post-mission trip VAS responses showed a significant difference in all questions assessing perceived fulfillment, burnout, and resilience (see Figure and Tables). Level of self-perceived burnout decreased (mean difference -1.57, [-1.18, -1.96], $p<0.001$). All other metrics showed significant increase post-mission trip, including confidence in chosen career path (mean difference 1.15, [0.91, 1.39]), appreciation and enjoyment in studies/work (mean difference 1.19, [0.97, 1.40]), perceived ability to adapt to change (mean difference 1.34, [1.12, 1.56]), perceived ability to achieve goals despite obstacles and failures (mean difference 0.95, [0.74, 1.16]), and perceived confidence to stay focused under pressure (mean difference 0.82, [0.63, 1.00]). All had $p<0.001$.

Conclusion: Compared to pre-mission trip, post-mission trip responses showed significant differences in all questions assessing perceived fulfillment, burnout, and resilience. Levels of self-perceived burnout decreased significantly while all other metrics showed significant improvements post-mission trip. Students and providers who choose to participate in mission trips or service-learning opportunities may experience returned inspiration or fulfillment in their career that can reduce burnout and improve resilience. Additional studies should be conducted to further evaluate these findings.

Figure 1: Change in self-perceived fulfillment, burnout, and resilience by VAS measurement pre- and post-mission trip. P<0.001 for all factors.

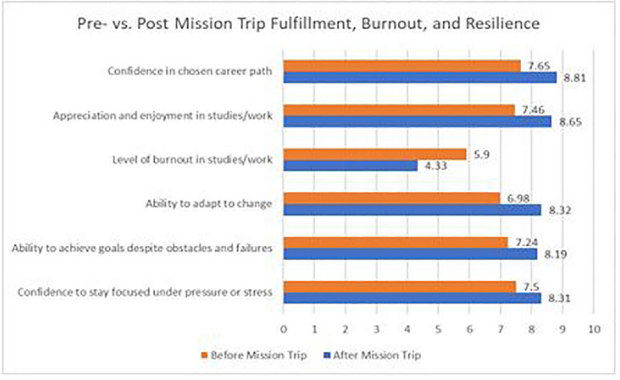

Table 1. Demographic information

Profession	Frequencies (n=163)
Allied Health	8 (5%)
Dentistry	12 (7%)
Medicine	88 (54%)
Nursing	17 (10%)
Pharmacy	3 (2%)
Rehabilitation	29 (18%)
Non-medical	6 (4%)

Table 2. Location of Mission Trips

Location	Frequencies
Africa	59 (36%)
Asia	24 (15%)
Australia	0 (0)
Caribbean	46 (28%)
Europe	9 (6%)
Indonesia/ Pacific	3 (2%)
South/Central America	130 (80%)
United States/Canada	5 (3%)

No, authors do not have interests to disclose

480 Assessing Sleep in Emergency Department Healthcare Workers

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Study Objectives: Adequate sleep correlates with positive outcomes in innumerable areas. While on the contrary, sleep deprivation can be detrimental to health and performance, especially for healthcare workers. Emergency medicine workers are often on shift-work schedules that lead to sleep deprivation and the consequential negative effects. Sleep deprivation has effects impacting numerous areas of health and performance. It impacts cognitive processing, executive functioning, attention, and impulsivity that influences work performance as well as knowledge retention, memory, and learning. These deficits ultimately impact patient care and increase risk of medical errors. Additionally, it's imperative to consider physician health and safety, including physical health, mental wellbeing, and burnout. Healthcare workers dedicate their careers to caring for others, and it's important we find ways we can do the least harm to providers in Emergency Medicine, and more broadly across medical fields. This research is intended to uncover current sleep habits, perceptions, and performance impacts amongst Emergency Medicine healthcare workers to identify areas for prevention and mitigation of the negative impacts of sleep deprivation.

Methods: We designed an online, questionnaire-based study to assess the sleeping habits of residents, attendings, and other health professionals in the emergency department (ED). Questions included demographic information, work schedules, current sleep habits including strategies and medications for sleep and wake cycles, and circadian rhythm patterns. Questions also included participant perceptions of their sleep's impacts on varying areas of life and work, including aspects of health, cognitive performance and patient care.

Results: The preliminary data includes 71 total participants, with 38 males (54%) and 33 females (46%). The majority of participants were attending physicians with 26 (37%), 1 fellow (1%), 21 residents (31%), 18 nurses (25%) and 5 ED techs (7%). A majority of participants (50, 70%) slept between 5-7 hours each night. The areas of life that participants perceived as negatively impacted by their poor sleep included cognitive performance (35, 49%) physical performance (34, 48%), mental health (34, 48%), and memory and learning (33, 49%). Additionally, participants reported worse communication in the work environment among teammates and patients when sleep deprived (28, 39%) and complications associated with poor sleep including decision making errors (10, 14%), missed results (10, 14%) and medication errors (7, 10%).

Conclusion: This survey illuminates that healthcare workers in the ED are experiencing detrimental impacts of poor sleep on physical and cognitive performance, as well as impacts on work performance including medical errors and poor communication amongst colleagues. By understanding the current schedules and sleep habits of healthcare workers, and the perceived effects on performance and wellbeing, we can identify areas for future investigation and focus on interventions to benefit the health of both providers and the patients they serve.

No, authors do not have interests to disclose

481 The Association Between Organizational Health Culture and Functional Fitness of Emergency Medical Technicians in Taiwan: A Prospective Cohort Study

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Study Objective: The health and wellness of emergency medical technicians (EMTs) is of great public health interest but rarely studied. As they rely heavily on teamwork, their well- being and performance can be greatly impacted by organizational health culture (OHC). Additionally, research shows that these first responders' physical fitness is a reliable predictor of their occupational performance. This study aims to investigate the relationship between OHC and the functional fitness of firefighters/EMTs in Taiwan, where a fire-based emergency medical services system is adopted.

Methods: We conducted a prospective cohort study in which 548 firefighters/EMTs in Tainan, Taiwan were enrolled in May 2023 and followed up for ten months. A total of 369 subjects (67.3%) were included for analysis after those with missing values were removed. Participants filled in an online questionnaire utilizing the Research Electronic Data Capture platform upon enrollment. Within the questionnaire, 34 questions constituted six OHC domains, including leadership support, leadership commitment, sleep and mental health policy, physical activity and nutrition policy, organizational approach, and sense of belonging. Subjects were divided into two groups (lower versus higher OHC) by the median of all subjects' total OHC scores. Functional fitness results were retrieved from their semi-annual evaluation reports, including performance metrics in standing long jump, overhead back toss, deadlift, cliffhanger pull-up, 6-meter out-and-back run, farmer's walk, and 1,500-meter run. Each subject underwent two fitness tests at different semi-annual times. We performed mixed-effects linear regression to investigate the association between the baseline OHC score and each repeatedly measured fitness test item after adjusting for age and sex. To account for individual differences, each subject was regarded as a cluster in the models.

Results: There were 181 and 188 subjects categorized into the lower and higher OHC score groups, respectively (Table 1). The higher OHC score group demonstrated significantly higher scores across all six domains. They tended to sleep

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longer and depend less on sleep medications (both $p<0.05$). After adjustment, a one-point increase in baseline OHC score was associated with a 0.78 increment in the number of cliffhanger pull-ups (95% confidence interval [0.04-1.52], p=0.04) (Table 2).

Conclusion: Firefighters/EMTs with higher OHC scores exhibited improved fitness performance in cliffhanger pull-ups. This novel finding suggests a potential link between organizational culture and work performance among emergency medical services providers.

Table 1. Characteristics and physical fitness test results of subjects with lower and higher total organizational health culture scores

Variables	Low Scoring (N=181)	High Scoring (N=188)	*p*-value
Age (year), mean (SD)	40 (6)	41 (7)	0.781
Sex: Male (N, %)	170 (93.9%)	176 (93.6%)	1.000
Smoking (N, %)	36 (19.9%)	24 (12.8%)	0.087
Body mass index, median [IQR]	25.8 [24.0;28.3]	25.0 [23.5;27.3]	0.137
Job tenure (year) (N, %)			0.937
<4	3 (1.66%)	3 (1.60%)	
4-10	37 (20.4%)	41 (21.8%)	
>10	141 (77.9%)	144 (76.6%)	
Occupational injury (N, %)	72 (39.8%)	65 (34.6%)	0.354
Work hour per week (N, %)			1.000
≤50	17 (9.39%)	17 (9.04%)	
>50	164 (90.6%)	171 (91.0%)	
Shift pattern (N, %)			0.280
Regular	8 (4.42%)	5 (2.66%)	
1 on 1 off	12 (6.63%)	7 (3.72%)	
2 on 2 off	161 (89.0%)	176 (93.6%)	
Sleep hour per 24 hours (N, %)			0.010
<7	115 (63.5%)	91 (48.4%)	
7-9	63 (34.8%)	90 (47.9%)	
>9	3 (1.66%)	7 (3.72%)	
Sleep medication use per week (time) (N, %)			0.017
<2	165 (91.2%)	184 (97.9%)	
2-4	10 (5.52%)	2 (1.06%)	
>4	6 (3.31%)	2 (1.06%)	
Organizational health culture domains, median [IQR]			
Leadership support	26.0 [19.0;30.0]	33.0 [30.0;38.0]	<0.001
Leadership commitment	13.0 [8.00;15.0]	16.0 [15.0;20.0]	<0.001
Sleep and mental health policy	13.0 [10.0;15.0]	16.0 [15.0;19.0]	<0.001
Physical activity and nutrition policy	12.0 [12.0;14.0]	16.0 [14.0;17.0]	<0.001
Organizational approach	12.0 [8.00;12.0]	12.0 [10.0;13.0]	0.015
Sense of belonging	17.0 [14.0;18.0]	22.0 [20.0;24.0]	<0.001
Physical fitness test, median [IQR]			
Standing long jump distance (cm) (1st)	210 [200;220]	210 [200;220]	0.878
Standing long jump distance (cm) (2nd)	210 [200;220]	210 [200;220]	0.452
Overhead back toss distance (m) (1st)	12.5 [11.5;13.8]	12.3 [11.0;13.1]	0.218
Overhead back toss distance (m) (2nd)	12.0 [11.0;13.5]	12.0 [11.0;13.0]	0.973
Deadlift weight (kg) (1st)	110 [100;120]	110 [100;120]	0.715
Deadlift weight (kg) (2nd)	110 [100;120]	110 [100;120]	0.206
Out-and-back run (time) (1st)	14.0 [14.0;15.0]	14.0 [14.0;15.0]	0.917
Out-and-back run (time) (2nd)	14.0 [13.0;15.0]	14.0 [13.0;15.0]	0.423
Cliffhanger pull-up (time) (1st)	8.00 [6.00;11.0]	10.0 [6.75;12.0]	0.030
Cliffhanger pull-up (time) (2nd)	10.0 [7.00;12.0]	10.0 [7.00;12.0]	0.317
Farmer's walk for 20m (kg) (1st)	100 [90.0;110]	100 [90.0;110]	0.844
Farmer's walk for 20m (kg) (2nd)	100 [100;120]	100 [100;110]	0.269
1,500-meter run time (min) (1st)	8.36 [7.20;9.30]	8.33 [7.29;9.20]	0.854
1,500-meter run time (min) (2nd)	8.17 [7.32;9.05]	8.22 [7.36;9.14]	0.857

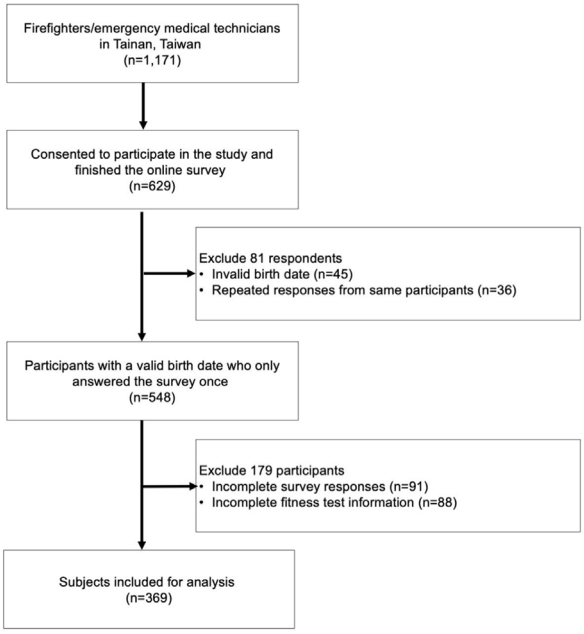
Abbreviation: SD, standard deviation; IQR, interquartile range; cm, centimeter; m, meter; kg, kilogram; min, minute; 1st, the first physical fitness test; 2nd, the second physical fitness test

Table 2. Mean differences in physical fitness test items between higher and lower organizational health culture score groups measured by mixed-effects linear regression models

	estimate*	95% confidence interval	*p*-value
Standing long jump distance (cm)	1.14	-1.93 – 4.22	0.466
Overhead back toss distance (m)	-0.34	-0.92 – 0.24	0.249
Deadlift weight (kg)	-1.65	-4.98 – 1.68	0.332
Out-and-back run (time)	0.11	-0.13 – 0.35	0.362
Cliffhanger pull-up (time)	0.78	0.04 – 1.52	0.040
Farmer's walk for 20m (kg)	-1.25	-3.96 – 1.47	0.367
1,500-meter run time (min)	-0.00	-0.22 – 0.22	0.979

Abbreviation: cm, centimeter; m, meter; kg, kilogram; min, minute
* Adjusted for age and sex

Figure. Subject selection flowchart



No, authors do not have interests to disclose

EMF 482 Cerebral Microdialysis Fluid as a Source of Protein Biomarkers in a Porcine Model of Traumatic Brain Injury

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Study Objectives: Severe traumatic brain injury (TBI) is a common diagnosis seen in the emergency department (ED) with increasing frequency. Outcomes of TBI are incredibly variable and we have limited tools for predicting and preventing morbidity. Peripherally collected (often serum) protein biomarkers for morbidity of TBI have been largely limited in utility, possibly because of the complexity of diffusion or transport across the blood brain barrier. Neuroinflammation has been investigated as an influential factor both for determining the severity of insult and allowing for recovery from TBI. This study sought to add to the body of knowledge of inflammatory protein biomarkers in TBI, specifically interleukin-6 (IL6), a pleiotropic cytokine shown to be influential and often predictive in many diverse neurological pathologies. Specifically we sought to determine if levels of IL6 in the local neuronal extracellular microenvironment at the site of injury is reflected in levels measured simultaneously in cerebral spinal fluid (CSF). Secondarily, we compared protein levels of IL6 in these biofluids between sham-injury and TBI animals.

Methods: We applied either controlled cortical impact (CCI) injuries or sham-injury craniotomy to anesthetized pigs then collected simultaneous samples from cerebral microdialysis (CM) fluid and CSF. The experimental animals in these studies have underwent CCI in the right frontal lobe (4 m/s, 100 ms dwell time, 13 mm depth). The membrane utilized for the CM fluid collection here is permeable to a kDa level allowing for diffusion of IL6 from the cerebral space into microdialysate. The presence of overall protein and IL6 protein were confirmed and evaluated in CM and CSF using commercially available assays. Experiments to measure serum levels are ongoing, as are experiments to evaluate other substrates from the IL6 signaling pathway.

Results: While IL6 ELISA kits have been validated for porcine CSF and serum, there is no published research to date validating the use of these assays in CM. To confirm the presence of protein in CM, BCA assays were done on non-time-paired CM samples and showed a measurable amount of total protein (range 71- 358ug/mL). To confirm presence of IL6 protein, western blot was done on an additional non-time-paired CM sample which showed the expected band size for the IL6 probe (~24 kDa). IL6 ELISA measured IL6 protein levels in 12 total CM samples (9 time-paired with CSF: 5 TBI & 4 sham). To confirm microdialysis sample matrix did not contain components that affect assay response to the analyte differently than the standard diluent, spike & recovery method was employed on the above IL6 ELISA with >90% sample recovery. CSF IL6 levels of 22 total samples (9 time-paired) were measured. Results of these experiments do not show a linear correlation within subject for IL6 between time paired CSF and CM fluid. There is a trend for higher IL6 protein in both CSF and CM of sham animals when compared to TBI.

Conclusion: Levels of IL6 in the local neuronal extracellular microenvironment at the site of injury as measured in CM is not immediately reflected in the CSF. Future studies to evaluate correlation with immediate and delayed serum levels and evaluate other crucial factors within the IL6 pathway, namely the soluble IL6 receptor, are ongoing. Notably, in severe TBI patients with an extraventricular drain in place, it would be feasible to sample CSF for these purposes. Additionally, CM can be performed in a neurocritical intensive care unit as part of multi-modality monitoring with a quad lumen bolt. The studies herein can provide preliminary data to support analysis of these factors in human patients.

No, authors do not have interests to disclose

483 Factors Associated With Timely Administration of Thrombolytics in Acute Ischemic Stroke

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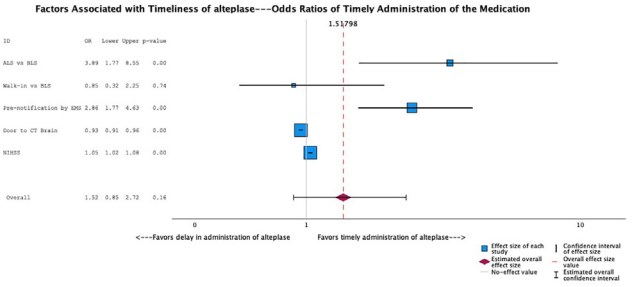
Study Objective: Stroke is the fifth leading cause of death in the United States, occurring roughly every four minutes, with ischemic strokes accounting for about 87% of cases. Additionally, stroke is a major contributor to long-term disability. Prompt administration of intravenous thrombolytics, such as alteplase, is vital for acute ischemic stroke patients, as it has been shown to significantly improve outcomes. However, identifying eligible patients for this treatment in a busy emergency department (ED) can be challenging. To address this issue, a comprehensive study spanning five years was conducted at an urban teaching hospital. The goal was to pinpoint factors significantly associated with delays in administering thrombolytics beyond the recommended 60 minutes from presentation. This research aims to enhance the quality of care for stroke patients and meet national and institutional door-to-needle time targets more effectively.

Methods: A retrospective chart review was conducted at a busy urban teaching hospital on 430 adult patients diagnosed with acute ischemic stroke and treated with thrombolytics in the emergency department over five years (2013-2018). Factors evaluated included mode of arrival, prenotification, signs and symptoms, vital signs, comorbidities, National Institutes of Health Stroke Scale (NIHSS), time to imaging, race/ethnicity and language. A univariate logistic regression analysis was performed to identify factors associated with timely thrombolytic administration.

Results: Over the relevant period, 430 patients were analyzed. Four of the factors evaluated were found to be statistically significant: arrival mode to the ED, prenotification by Emergency Medical Services (EMS), time to initial computed tomography (CT) scan and NIHSS score. Arriving via advanced life support (ALS) units increased the likelihood of on-time thrombolytics by almost four times; prenotification of arrival by almost three times. Each minute delay in time to CT scan was associated with a 6.5% decrease in chance of giving timely thrombolytics, and every one-point increase in NIHSS was associated with a 5.1% increase in chance of timely thrombolytics.

Conclusion: Patients with higher NIHSS scores demonstrated a greater likelihood of receiving timely thrombolytic administration. Moreover, expedited imaging and efficient use of EMS resources, such as ALS units and prenotification of arrival, were associated with improved treatment timeliness. Interestingly, demographic variables like age, race, and gender, as well as vital signs and comorbidities, did not show significant associations. These findings underscore the importance of prioritizing NIHSS scoring and optimizing EMS protocols to ensure timely care for stroke patients in emergency departments.



No, authors do not have interests to disclose

484 Probability of Acute Stroke Detection in Pre-Hospital and Emergency Department Stroke-Alert Activations

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Study Objectives: Timely recognition of acute neurologic emergencies such as acute ischemic stroke in the emergency department (ED) is essential to identify patients who may be eligible for an acute intervention. Protocols to stream-line systems-based-care, such as "stroke-alerts", can improve processes to reduce time-to-care while enhancing safety. We sought to describe the appropriateness and detection rate of stroke-alerts initiated by both pre-hospital and ED providers in adult patients with neurologic symptoms concerning for acute ischemic stroke.

Methods: We conducted a retrospective, observational quality improvement study at a single, quaternary care academic ED in Tennessee. We identified both pre- hospital and ED adult patients presenting with acute neurological deficits concerning for acute ischemic stroke who received an established protocolized STAT stroke-alert consultation between 2018 and 2023. The primary outcome was the percentage of appropriate stroke-alert consultations defined by established institutional criteria including one of the following: Large Vessel Occlusion (LVO; sudden onset unilateral arm and/or leg weakness plus one of additional symptoms including gaze deviation, hemineglect, or aphasia and last known well (LKW) time within 24 hours of presentation), BEFAST (sudden onset of abnormal symptoms including Balance, Eyes, Face, Arm and leg, Speech, and Time with LKW within 12 hours), or WAKE-UP (BEFAST symptoms upon waking up and presenting within 4 hours). Secondary outcomes include number of ischemic and/or hemorrhagic strokes identified, number of large vessel occlusions identified, and percentage of patients receiving magnetic resonance imaging (MRI).

Results: There were 861 adult stroke-alert activations during the study period; the median age (interquartile range [IQR]) was 63 (50, 73) years, 450 (52%) were female, 174 (20%) were Black race, 152 (18%) had a past history of cerebrovascular accident, and 56 (7%) had a past history of transient ischemic attack. Of the 861 stroke-alert activations, 562 (65%) met at least one of the institutional pre-selected eligibility criteria, and of these, 124 (22%) had an ischemic stroke, 45 (8%) had a hemorrhagic stroke, 55 (10%) received a thrombolytic medication, and 35 (6%) received cerebral angiography. Of the 299 (35%) inappropriate stroke-alert activations, 60 (20%) had an ischemic stroke, 21 (7%) had a hemorrhagic stroke on brain imaging, 1 (0%) received a thrombolytic medication, and 9 (3%) received cerebral angiography.

Conclusion: For STAT stroke-alert consultations performed in both the pre-hospital and ED setting, medical providers appropriately initiated a large proportion of

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alerts by institutional criteria with similar stroke identification rates as demonstrated within the literature. The relatively high percentage of ischemic events identified in inappropriately identified stroke-alerts is likely attributed to being outside the time window for appropriate activation. Continued education directed toward clinical providers may improve the appropriateness of initiating stroke-alert consultation and improve the overall usage of institutional resources and patient outcomes during the presentation of acute neurological emergencies.

No, authors do not have interests to disclose

485 Healthcare Resource Use After Etripamil Treatment to Terminate Paroxysmal Supraventricular Tachycardia: A Pooled Analysis of Phase 3 Clinical Trials

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Study Objective: Paroxysmal supraventricular tachycardia (PSVT) is a cardiac arrhythmia characterized by a episodic and abrupt increases in heart rate, most often with resultant marked symptoms. Symptoms can be severe and often require medical intervention for resolution, such as intravenous (IV) drugs, leading to inconvenience, unexpected expense, and reduced quality of life, as well as substantial levels of healthcare resource utilization (HRU). Etripamil is a fast-acting, nondihydropyridine, calcium-channel blocker (CCB) spray, which is in development for self-administration in a medically unsupervised setting for the acute treatment of PSVT. Phase 3 results have demonstrated a robust treatment effect of etripamil to rapidly convert AV-nodal dependent PSVT to sinus rhythm (SR), without serious drug-related adverse events. The goal of this analysis is to characterize HRU in Phase 3 trials of etripamil.

Methods: Clinical trial data assessing additional medical interventions following study drug administration were pooled from 3 randomized double-blind studies (NODE 301 part 1, RAPID, and RAPID Extension) and 4 open-label etripamil studies (NODE 302, RAPID Open Label, RAPID Extension Open Label, and NODE 303). Additional medical interventions were defined as any action or treatment other than self-administration of study drug, including administration of an oral pill-in-pocket at home upon instruction from a healthcare provider; emergency department (ED) visits for treatments including IV medication, electrical cardioversion, oral drug administration, or urgent healthcare practitioner directed vagal maneuver (VM).

Results: In randomized trials, pooled by prespecified analysis, 370 patients (placebo, n=149; etripamil, n=221) self-administered study drug for a PSVT episode, and 18.6% (69/370) then sought additional medical intervention. In the etripamil arm, 14% (31/221) of patients sought and received additional medical intervention to resolve PSVT vs 25.5% (38/149) in the placebo arm (P=0.005; **Table**), a 45% relative reduction. Of patients in open-label studies, 14.4% in NODE-303 sought additional medical intervention after self-administering etripamil for a PSVT episode, 13% in NODE-302, and 9.9 or 14.3% in RAPID and RAPID Extension open-label phases (**Table**). The majority of additional interventions required IV drugs in an ED setting.

Conclusion: These findings indicate that the proportions of patients seeking and receiving additional medical intervention were consistent across all studies, and lower in etripamil-treated patients, ranging from 6.7% to 15.2% in 7 different etripamil groups, and from 24.7 to 26.3% in 3 different placebo groups. Using symptom-prompted, self-administered etripamil for PSVT could lead to a reduced need for the use of additional medical interventions, including ED visits and the need for IV drugs, reducing burden on healthcare systems.

Table. Patients seeking additional medical intervention after study drug treatment

	Ph 3 Randomized Double-Blind Studies[a]			Ph 3 Open-Label Studies			
	NODE 301 (Part 1)	RAPID	RAPID Extension	NODE-302	RAPID Open Label	RAPID Extension Open Label	NODE-303
Total number of patients	N=107	N=99	N=15	N=92	N=71	N=21	N=312
Number of etripamil-treated patients seeking additional medical intervention, n (%)	16 (15.0)	15 (15.2)	1 (6.7)	12 (13.0)	7 (9.9)	3 (14.3)	45 (14.4)
Total number of patients	N=49	N=85	N=15				
Number of placebo-treated patients seeking additional medical intervention, n (%)	13 (26.5)	21 (24.7)	4 (26.7)				

[a] Across randomized trials, healthcare resource use was significantly lower in the etripamil arm versus the placebo arm (P=0.005). Ph = phase.

Yes, authors have interests to disclose

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Other

Steering committee for Milestone Pharmaceuticals

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Other

Steering committee for Milestone Pharmaceuticals

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Employee

Employee of Milestone Pharmaceuticals

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486 Presentation and Outcomes of Pediatric Myocarditis in the Emergency Department: A Systematic Review and Meta-Analysis

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Study Objective: Pediatric myocarditis, although uncommon, presents a significant risk of mortality and morbidity. This study aimed to analyze the clinical presentation, laboratory and radiographic findings, and outcomes of pediatric myocarditis in the emergency department (ED).

Methods: We searched databases up to December 2023. A systematic literature review and meta-analysis were conducted following PRISMA guidelines. Quality assessment was performed using Cochrane Collaboration's modified risk of bias assessment 2.0 and Newcastle-Ottawa Scale. Data were extracted and synthesized for analysis using OpenMeta software.

Results: Seventeen studies met our pre-specified inclusion criteria. Clinical presentations included poor feeding (60.4%), fever (51%), respiratory symptoms (49.8%), and hypoperfusion (45.9%). Heart failure (39.9%) and dysrhythmias (20.6%) were common syndromes on admission. Elevated troponin (80.4%) and C-reactive protein (63.3%) were common laboratory findings. ST or T wave abnormalities (47.5%) were prevalent on ECG, while cardiomegaly (44.7%) was common on chest X-ray. ICU admission was required in 88.1% of cases, with 46.9% requiring mechanical ventilation. The mortality rate was 15.7%.

Conclusion: Our findings highlight that pediatric myocarditis can present with a wide range of non-specific symptoms and signs, including poor feeding, fever, respiratory symptoms, and hypoperfusion. The prevalence of heart failure and dysrhythmias upon admission further complicates its clinical presentation. These complexities necessitate a high index of suspicion for timely diagnosis and management, as evidenced by the high rates of ICU admission and significant mortality associated with pediatric myocarditis.

No, authors do not have interests to disclose

488 Impact of Housing Status and Treatment Engagement for Emergency Department Patients With Substance Use Disorders

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Background: Patients experiencing homelessness (PEH) have high prevalence of substance use disorder (SUD) and visit the emergency department (ED) frequently.

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Study Objective: We sought to identify the relationship between housing status and treatment engagement among patients that received a substance use consult by Health Promotion Advocates (HPAs) during an ED visit between 2015 to 2023.

Methods: This is a retrospective cross-sectional study from 2015 and 2023 of ED patients evaluated by Project ASSERT, an ED-based screening and referral program, where HPAs perform a Brief Negotiation Interview (BNI) which assesses readiness to change on a scale from 1-10 their drug use. Homelessness was identified through ICD-10 codes, addresses, and chief complaint. Descriptive statistics were used to evaluate differences in demographics and BNI between housed and unhoused cohorts. Binary logistic regression was used to evaluate the relationship of housing status to self-reported lifetime history of overdose (OD), repeat HPA encounters, and enrollment in addiction treatment.

Results: A total of 16,844 visits included a Project ASSERT consult: 1,867 (20.84%) unique PEH accounting for 11,339 (67.32%) visits. PEH were more likely to be male, older, Black, and Medicaid insured. Opioid use disorder (OUD) and alcohol use disorder (AUD) were more prevalent in PEH compared to housed [45.74% vs 34.22%; p<.001] and [79.91% vs 77.02%; p<.0001] respectively. The likelihood of lifetime OD was 20% higher for PEH [OR=1.20, 95% CI 1.08-1.34; p<.001]. There was no difference in BNI scores between PEH and housed patients for both alcohol [7.15 vs 7.11; p=.48] and opioids [7.48 vs 7.59; p=0.11]. There was no difference between PEH and housed patients in the likelihood of enrollment in treatment programs [79.01% vs 79.72%; p=0.41]. PEH were more likely to have a repeat HPA encounter within 30-days [OR=1.39, 95% CI 1.27-1.53].

Conclusion: In ED patients with SUD, experiencing homelessness was associated with higher risk of OD. Despite no significant differences in readiness to change use and likelihood of treatment enrollment, PEH are more likely to have repeat ED-based HPA encounters within 30 days. These findings may suggest an increased likelihood of return to use. Further research and strategies are needed to address housing status concurrently with SUD.

No, authors do not have interests to disclose

489 Incidence Rates and Social Factors Associated With Heart Failure-Related Encounters in Metropolitan Detroit, Michigan, Emergency Departments From 2018-2024

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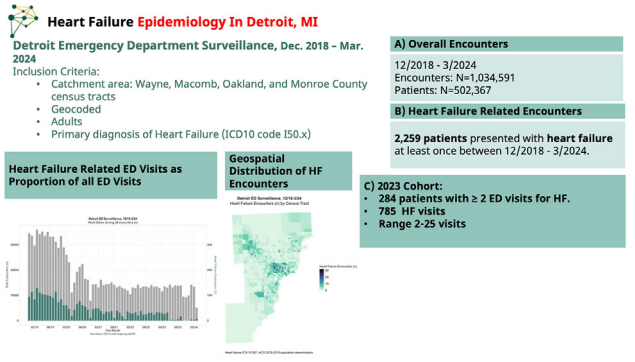
Study Objective: Population-level heart failure (HF) incidence and hospitalizations have increased in the past decade but there is sparse evidence on emergency department (ED)-related visits, particularly from densely populated urban areas in the post-pandemic era. Lack of epidemiologic data is detrimental as individuals in these areas often experience substantial social and economic stressors, which prior literature has suggested are associated with greater ED use and worse outcomes. The goal of this project was to estimate the prevalence and incidence density rates of HF-related ED visits in Metropolitan Detroit, MI, and characterize associations between measures of social stress, ED visits, and hospital admissions for HF.

Methods: Using an existing surveillance database from 5 EDs, we identified adults presenting between 12/2018-3/2024 and had home addresses that were geocoded in four catchment counties. HF was identified as the primary diagnosis by ICD-10 codes (I50.x). Prevalence and incidence density rates were calculated per 10,000 (10k) encounters, unique patients, and total population (separately) using county denominators from the 2020 U.S. Census. Trends were examined using locally weighted regression. A subset of patients had data available for repeat ED visits and ED disposition from 2023. We matched patients to zip code-level Social Deprivation Index (SDI, range 0-100 with greater scores representing more deprivation), proportion of patients without health insurance (PWI), and mean systolic blood pressure (SBP) of patients visiting the ED, abstracted from the Wayne State Population Health Outcomes Information Exchange (PHOENIX). Social factors associated with repeat ED visits were modeled using negative binomial regression. For factors associated with admission vs discharge, a mixed-effects logistic model with a random intercept for each patient was used. In both models, the primary predictor of interest was SDI, and an offset was used: ED visits per 100k patients from each zip code (also abstracted from PHOENIX) for the negative binomial model and number of repeat ED visits for the logistic model. Selection of final models was based on Bayesian Information Criteria.

Results: The 502,367 patients who presented during the study period accounted for 1,034,591 total encounters. There were 2,259 unique patients with EHR-documented HF resulting in estimated prevalence rates of 5.7 (95% CI 5.5-5.9) per 10K total population, 25.3 (95% CI 24.3-26.3) per 10K encounters, and 45 (95% CI 43.1-46.8) per 10k unique patients. Incidence density rates declined after 2020, but the pattern coincided with an overall reduction in ED utilization. In the 2023 cohort, complete data were available on 284 patients who accounted for 785 HF visits. Unadjusted SDI < median (95, IQR 6) was associated with increased relative risk (RR) of a repeat ED visit of 1.36 (p<0.0001). After adjusting for PWI, RR of a repeat visit for SDI was 1.12 (p=0.2) and for PWI 9.42 (p=0.0005). The same pattern was seen for odds ratio (OR) of admission: unadjusted SDI < median, OR 1.84 (p=0.01); adjusted for PWI, SDI < median OR 1.06 (p=0.8), PWI OR 8.76 (p=0.001). Other social factors assessed were not associated with repeat visits or hospital admission.

Conclusion: Overall ED use as well as the incidence density rate of HF-related ED encounters declined among metropolitan Detroit EDs from 12/2018 to 3/2024. In the unadjusted analysis, lower SDI (less deprivation) was associated with more ED re-visits and more admissions, but this effect was lost after adjusting for PWI in patients' zip code. In fact, the effect of living in a zip code with a larger PWI had a markedly greater effect than SDI. Given that the pandemic changed how patients interact with the healthcare system (eg, where, when, and from whom they seek care), further study is needed to elucidate the complex relationships between social stressors and ED attendance. Future research should also explore ways in which lack of health insurance can affect HF care (eg, lack of options for outpatient follow-up). Investigations in other locations are likewise needed to confirm our findings.



No, authors do not have interests to disclose

490 Linguistic Diversity and Its Impact on Emergency Department Utilization: A Nationwide Retrospective Analysis

Kerich L, Turer R, Rotoli J, Gannett J, McDonald S, Diercks D, Mirus C/University of Texas Southwestern Medical Center, Dallas, Texas, US

Study Objectives: The United States' linguistic landscape is undergoing a significant transformation, driven by sustained immigration trends and the resultant increase in Non-English Language Preference (NELP) populations. This evolving diversity presents challenges to emergency departments (EDs), where effective communication is crucial for providing timely, equitable, and high-quality care. This study explores national and regional United States (US) ED utilization trends between English-speaking and NELP populations to enhance understanding and address these challenges.

Methods: We analyzed data from Epic's Cosmos database, which included 96,086,392 ED encounters from October 1, 2020, to October 31,2023, across the eight most common languages: English, Spanish, Chinese, Arabic, American Sign Language (ASL), Portuguese, French, and Vietnamese. Given the database's continuous growth, we adopted a proportional analysis methodology, enabling a nuanced examination of ED visit trends amidst an expanding patient dataset for English speakers (89,452,930 ED encounters) compared to NELP populations (5,034,792 ED encounters) overall and by census region (Northeast, West, Midwest, and South). We also categorized the number of ED encounters by census region for each language to identify any language dependent regional variation during the three-year study period.

Results: Our analysis revealed a consistent inverse relationship between ED utilization rates of English speaking and NELP populations across all regions. Specifically, French-speaking encounters notably increased in the Midwest and Northeast; Portuguese-speaking encounters rose in the Northeast; and Spanish-speaking encounters significantly increased in the South, along with substantial rises also observed in the West and Northeast.

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Conclusion: This analysis indicates a growing reliance on ED services among the NELP community, which correlates with immigration trends observed during the study period. Regional differences in linguistic diversity emphasize the challenges for hospitals to quickly adapt to the varied linguistic and cultural demographics they serve. Such adaptation is essential for improving patient care and determining resource allocation, including targeted funding and certified medical interpreter training programs tailored to specific regional needs. Future research should explore the potential of similar Electronic Medical Record (EMR) extraction methodologies to provide insight into regional immigration patterns and their impact on health disparities. Understanding these utilization trends is vital for informing public health and healthcare policies to better serve linguistically diverse populations. In addition, it is essential to assess the frequency of interpretation use and language-concordant care, often not accurately captured in EMRs along with patient-centered data on health outcomes to identify and address disparities effectively. This study underscores the critical need for healthcare systems to evolve in response to these demographic shifts, ensuring that all individuals receive language- concordant, effective, and timely care regardless of language preference.

Language Group-Region	Tau	p
English-Overall	-0.8318318	< 2.2e-16
NELP-Overall	0.8318318	4.219e-15
English-Northeast	-0.7477477	1.042e-13
English-West	-0.7777778	3.529e-15
English-Midwest	-0.7237237	1.189e-12
English-South	-0.7957958	3.738e-16
NELP-Northeast	0.7477477	1.072e-13
NELP-West	0.7777778	7.105e-15
NELP-Midwest	0.7237237	1.193e-12
NELP-South	0.7957958	4.219e-15

Table 1: Tau and p-values for English and NELP populations overall and by region.

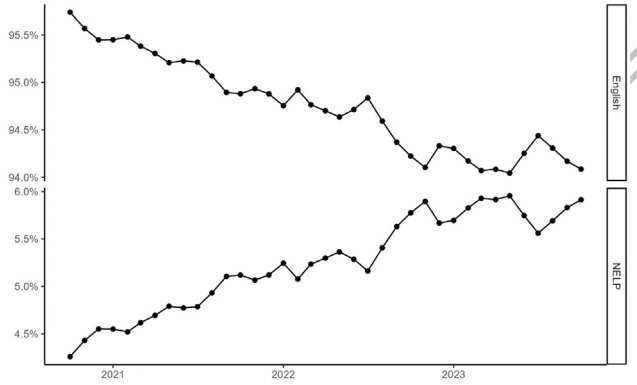

Figure 1: Proportional analysis of English and NELP ED encounters overall.

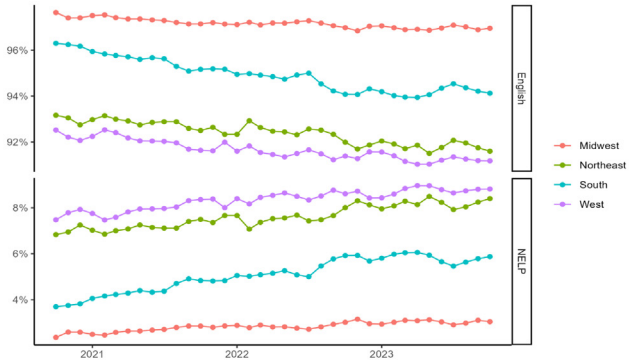

Figure 2: Proportional analysis of English and NELP ED encounters by region.

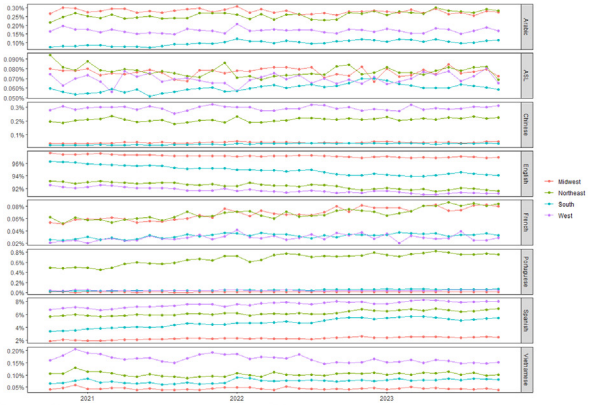

Figure 3: Proportional analysis of top 8 language ED encounters by region.

No, authors do not have interests to disclose

491 WITHDRAWN

492 The Epidemiology and Burden of Uncomplicated Alcohol Intoxication in the Emergency Department

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Study Objectives: Alcohol intoxication and abuse are common presentations in an urban emergency department (ED). There is little data on the financial charges, insurance status and financial implications of alcohol intoxicated patients in the ED. We reviewed records of patients discharged from the two urban NYC EDs with a final diagnosis consistent with alcohol intoxication who had no or minimal (eg, point of care serum glucose measurement) interventions performed, suggesting that the clinical picture was consistent with alcohol intoxication in order to understand the demographics and basic financial impacts.

Methods: In this retrospective cohort analysis of a two, large, urban ED, with a combined yearly census of approximately 150,000 patients, all unique patient encounters between June 2018 and December 2021 with a discharge diagnosis consistent with an acute alcohol intoxication were included. Mixed intoxications were not, although as diagnoses were generally made by patient or EMS history/presentation, this likely underestimated co-ingestions. We did not routinely test for alcohol level or toxicological screening in the absence of clinical indications. ICD 10 F101.x codes were used encompassing alcohol abuse, use and dependence. Patients were excluded if they were admitted or had any testing beyond blood glucose or receiving an immunization (tdap or flu) or Covid testing, suggesting they had presentations or complaints for other than ETOH or that it was arrived at as a diagnosis after testing or interventions. Information gathered include Visit facility code, % patients with final diagnosis that fit criteria (minimal to no interventions), insurance status and overall charges.

Results: Of 495,436 patient presentations to the EDs during the time period, 16,526 (3%) met criteria of a diagnosis of alcohol intoxication/abuse or dependence

only. 10,800 were unique medical record numbers with ED visits per patient ranging from 1-130 visits over the time period. Of those, 13,454 met criteria of no testing or intervention other than serum glucose measurement, immunization or Covid testing (2.7% of total patients, 81% of patients with ETOH diagnosis). The majority of patients with a final diagnosis included were billed as a level 3 facility code, (76%) although the level was likely influenced by charting and the small percentage who had other testing and interventions. The majority were self-pay (69%) or Medicaid (24%), with commercial insurance about 8%. 76% were male and 24% were female.

Conclusion: Patients with acute alcohol intoxication and no other complaints are a relatively small minority of ED patient yet result in significant charges and ED resources. While the collections were not calculated, in general self-pay, the sources of vast majority of patients, is collected at a rate and amount markedly below all other payers. About 25% of the patients had multiple visits. Opportunities to provide proven ETOH interventions should consider the unreimbursed costs of ED patients with intoxication when considering cost effectiveness.

No, authors do not have interests to disclose

493 Food Insecurity Prior to Hematopoietic Stem Cell Transplant Is Associated With Malnutrition, Higher Emergency Department Utilization, and Worse Outcomes

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Study Objectives: We aimed to evaluate the hypothesis that food insecurity (FI) prior to hematopoietic stem cell transplant (HSCT) impacts the likelihood of being malnourished, requiring nutrition support, psychosocial outcomes, and the impact on emergency department (ED) utilization.

Methods: This single center prospective study focused on patients who underwent their first allogeneic HSCT at the Duke Adult Bone Marrow Transplant (ABMT) clinic between February 2018 and August 2022. We screened all patients across multiple dimensions of health, including FI, through the standard of care (SOC) Clinical Pre-Transplantation Optimization Program (C-POP). For this analysis, we excluded patients who had an autologous or a prior allogenic HSCT. The primary outcome was the likelihood of malnutrition, while secondary outcomes included ED visits, overall survival (OS), hospital length of stay (LOS), non-relapse mortality rate (NRM), depression, nutrition support, and acute GVHD (aGVHD) and chronic GVHD (cGVHD) occurrence. Statistical analysis included comparisons of patient characteristics between treatment groups performed using Chi-squared test or Fisher's exact test for categorical variables, and the analysis of variance or Wilcoxon Rank Sum test for continuous variables, respectively. Survival analysis was performed using the Kaplan-Meier method for OS, NRM, aGVHD, and cGVHD.

Results: Between February 2018 and August 2022, C-POP evaluated a total of 284 patients before HSCT for FI. Of these, 71 (25%) were excluded due to missing or incomplete data. Of the 213 patients, 20 (9.4%) reported having FI prior to transplant (Table). Patients with FI were more likely to develop malnutrition during HCT (70% vs 45.1%, p=0.034), with a trend towards categorization as 'Severe', though this difference did not reach statistical significance (55% vs 33.7%, p = 0.098). A significantly higher percentage of FI patients needed total parenteral nutrition (TPN) compared to those without FI (65% vs 34.2%, p=0.013). Patients with FI were more likely to utilize the ED, (25% vs 3.2%, p<0.001), though the actual number of ED visits are likely underrepresented as a majority of HSCT patients are directly admitted. At the same time, FI was not associated with a difference in the number of hospitalizations (p=0.289) or hospital days (p=0.584). A significantly higher percentage of patients with FI screened positive for depression on the PHQ-9 questionnaire, observed at both pre-transplant (40% vs 10.4%, p=0.002) and post-transplant (35% vs 12.4%, p=0.020). There were no significant differences in survival or other secondary outcomes.

Conclusion: Food insecurity presents a significant challenge for cancer patients undergoing HSCT and has implications that extend beyond dietary intake. Our study is the first to our knowledge to demonstrate the increased likelihood of malnutrition in HSCT patients that experience FI prior to transplant. We found that patients with FI are associated with higher utilization of the ED, higher rates of depression and more likely to require intravenous nutrition support. Given the multifaceted nature of FI and its implications for HSCT, addressing this issue requires a comprehensive and multidisciplinary approach. Our study underscores the need for future multi-center studies with larger, more diverse cohorts and comprehensive longitudinal assessment to further elucidate the complex interplay between FI and HSCT outcomes. Additionally, raising awareness about the impact of FI on clinical outcomes and advocating for systemic changes are crucial steps toward promoting health equity and improving the overall well-being of cancer patients.

Table 1. Summary of outcomes for treatment groups defined based on whether patients experienced any FI prior to HSCT (N=213). Patients are based on whether they had negative screen for FI (patients without FI) or a positive screen for FI (patients with FI).

Characteristic	All Patients (N = 213; 100%)	Patients without FI (N = 193; 90.6%)	Patients with FI (N = 20; 9.4%)	P-Value
Malnourished (Any)	101 (47.4%)	87 (45.1%)	14 (70%)	0.034
Malnourished (Severe)	76 (35.7%)	65 (33.7%)	11 (55%)	0.098
Required TPN	79 (37.1%)	66 (34.2%)	13 (65%)	0.013
Pre-Transplant Weight (kg), median (IQR)	85.4 (72 - 96)	85.05 (71.6 - 96)	89.05 (81.2 - 98.95)	0.165
Pre-Transplant BMI (kg/m^2), median (IQR)	27.76 (24.75 - 31.18)	27.5 (24.41 - 30.96)	31 (27.71 - 33.94)	0.064
Post-Transplant Weight (kg), median (IQR)	80.35 (67.6 - 89.8)	80.35 (67.5 - 87.9)	84.8 (73.55 - 95.3)	0.300
Post-Transplant BMI (kg/m^2), median (IQR)	26.25 (23.42 - 28.91)	26.08 (23.33 - 28.64)	29.46 (26.29 - 33.17)	0.073
ED Visits				<.001
0	202 (94.8%)	187 (96.9%)	15 (75%)	
1	7 (3.3%)	3 (1.6%)	4 (20%)	
2+	4 (1.9%)	3 (1.6%)	1 (5%)	
Hospitalizations – Mean (SD)	1.04 (1.04)	1.06 (1.04)	0.8 (1.06)	0.289
Hospital Days – Mean (SD)	8.02 (11.29)	8.16 (11.41)	6.7 (10.22)	0.584
Pre-HSCT PHQ9 Screen	28 (13.1%)	20 (10.4%)	8 (40%)	0.002
Post-HSCT PHQ9 Screen	31 (14.6%)	24 (12.4%)	7 (35%)	0.020
All-Cause Death	75 (35.2%)	68 (35.2%)	7 (35%)	0.983
Non-Relapse Mortality	46 (21.6%)	42 (21.8%)	4 (20%)	0.855
Acute GvHD				0.930
High >2	15 (7%)	14 (7.3%)	1 (5%)	
Low <=2	64 (30%)	58 (30.1%)	6 (30%)	
None	134 (62.9%)	121 (62.7%)	13 (65%)	
Chronic GvHD				1.000
Severe	1 (0.5%)	1 (0.5%)	0 (0%)	
Mild-Moderate	68 (31.9%)	62 (32.1%)	6 (30%)	
None	144 (67.6%)	130 (67.4%)	14 (70%)	
Time to Engraftment (days)	19.2 (16.1 - 23.3)	19.2 (16.1 - 23.3)	19.2 (16.7 - 23.3)	0.962
Length of Stay (days)	86.5 (75.3 - 94.6)	86.5 (75.3 - 94.6)	86.8 (77.2 - 93.6)	0.630

No, authors do not have interests to disclose

494 Demographic and Societal Risk Factors for Pediculus-Associated Severe Anemia in Emergency Department Patients

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Study Objectives: Infestation with Pediculus species, or common lice, is frequently diagnosed in the emergency department (ED). Lice infestations are typically managed by physical removal of the organisms and anti-parasitic medications. Lice consume human blood, so prolonged and heavy infestations can plausibly lead to iron deficiency anemia. Severe anemia attributable to lice infestation has been rarely described in the literature in nine individual case reports and a single series of three patients. The objective of this study was to retrospectively review cases of lice-related severe anemia at a single public hospital to identify risk factors and common presentations for this previously poorly described disease process.

Methods: The medical records for ED patients presenting to Bellevue Hospital Center between 2016 and 2024 were screened for the diagnoses of lice infestation and severe anemia (hemoglobin less than 7 g/dL). Lice infestation was diagnosed clinically by the emergency physician in all cases. Nineteen patient records were found and retrospective chart reviews were performed. Patient records were reviewed for clinical characteristics of the ED presentation, patient co-morbidities, alternative etiologies for the anemia, and patient disposition.

Results: All patients were diagnosed with iron deficiency anemia. The average hemoglobin was 4.5 g/dL. Fifteen patients (83%) were found to have hemoglobin less than 5 g/dL, requiring multiple transfusions of packed red blood cells. No other acute cause for anemia was found in any patient after inpatient medical workup. Fourteen patients were admitted to either a medical or psychiatric floor; four patients had hemodynamic instability and were admitted to the medical intensive care unit. Fourteen patients (78%) were undomiciled and 10 (55%) had co-morbid substance use, and/or psychiatric disease. All patients were either discharged in good condition or remain hospitalized at time of submission.

Conclusion: In this cohort, profound anemia secondary to lice infestation was seen in patients with unstable housing, substance use, and severe psychiatric disease. Patients frequently presented with anemia without hemodynamic instability, consistent with the proposed mechanism of chronic blood loss. The cases reviewed here exceed the number of reported cases in the literature and were found in seven years at a single center, suggesting a substantially higher prevalence of lice- associated severe anemia than has previously been recognized. Routine laboratory assessment of patients with

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lice infestations is not currently recommended in any guideline but may be warranted in severe cases to assess for anemia requiring transfusion. This study was limited by its small size and retrospective nature, limiting its conclusions to qualitative assessment. Further investigation should be performed to establish the prevalence of comorbid conditions and the frequency of this disease process in other populations.

No, authors do not have interests to disclose

495 Why Patients Choose Care in the Emergency Department

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Study Objective: Understanding what motivates patients to utilize the emergency department (ED) is of interest to researchers, insurance companies, and healthcare organizations, in order to help mitigate unnecessary costs and better predict patient flow. This study sought to analyze determinants for ED utilization and assess if a patient's decision to seek care at an ED can be influenced.

Methods: A convenience sample of 1,001 patients was surveyed at CentraCare Emergency Trauma Center in St. Cloud, Minnesota. Eligible participants were patients with an acuity level of 2-5, on a measure of 1-5, who could provide verbal answers to a 12-question survey on what factors contributed to their decision to seek care at the ED. Patients who had a representative provide responses on their behalf were also included in this study.

Results: Our study concluded that 68.4% of patients ultimately utilized the ED because either they were directed there by another healthcare provider or they believed they had an emergent condition. In fact, data indicated that 33.2% of all patients surveyed were previously evaluated and referred by a healthcare professional. Despite their awareness of other care options, 90% of patients would return in the future, demonstrating a need for ED facilities.

Conclusion: Policymakers in health systems, emergency physician groups, insurance companies, and government programs should shift their focus from diverting patients away from the ED to working together to find a cost-effective solution to managing patient populations. The ED is not a "high-cost" burden on the health system; it is the health system's safety net and the informed choice of many patients for acute medical care.

No, authors do not have interests to disclose

496 Pain Intensity Two Weeks After an Emergency Department Visit and Persistent Opioid Use

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Study Objectives: Acute pain may transition to chronic pain, a debilitating illness marked by neuroanatomical changes, suffering, loss of productivity, and increased use of healthcare resources. The recent well-documented spike in opioid use is linked to a growing recognition of undertreated pain, a challenge that persists despite a growing understanding of the limitations associated with opioids. The goal of this project was to determine the association between preexisting chronic pain, moderate to severe pain at two weeks following an emergency department (ED) visit, and persistent opioid use.

Methods: This was a prospective observational cohort study performed in two EDs in New York City. Adults with acute or chronic pain of sufficient severity to require discharge with an oral opioid prescription were included. Chronic pain was defined as any pain that has been experienced for more than 50% of the days in the preceding 6 months. Exclusion criteria were any use of opioids, including tramadol within the previous six months, use of non-prescription opioid, illicit opioid use or hospital admission during the index visit. Research associates interviewed patients during the ED visit, two weeks and six months later by structured telephone interview. Persistent opioid use was defined as: six opioid prescriptions filled during the six months subsequent to the ED visit or an average of one/ month. Logistic regression models were constructed to evaluate the association between preexistent chronic pain and undertreated pain at two weeks after an ED visit with persistent opioid use while adjusting for demographic variables.

Results: During a twenty-nine-month period, 701 patients were approached for participation and 699 met inclusion criteria and consented to participate. 102/699 (15%, 95% CI: 12, 17) patients reported baseline chronic pain. Oxycodone-acetaminophen and codeine-acetaminophen combinations were the types of opioids prescribed most-frequently (570/699, 82% and 123/699, 18% respectively). The median (IQR) of morphine milligram equivalents dispensed was 50mg (25, 75mg). Two weeks after ED visit, 296/653 (45%, 95% CI: 42, 49) patients reported moderate to severe pain in the affected area. 17/699 (2.4%, 95% CI: 1, 4) received six or more opioid prescriptions in the six months. Baseline chronic pain and persistent moderate to severe pain two weeks after the ED visit were associated with persistent opioid use (OR 3.33, 95% CI: 1.20, 9.21 and OR 5.42, 95% CI: 1.53, 19.21).

Conclusion: Baseline chronic pain and undertreated pain at two weeks after and ED visit was associated with persistent use of opioids within 6 months of an ED visit among opioid-naive patients prescribed an opioid for acute or chronic pain in New York City EDs during the years 2020 and 2023.

BASELINE VARIABLES	
Age (years)	
18-44	310 (44%)
45-64	286 (41%)
≥65	103 (15%)
Gender	
Male	310 (44%)
Female	389 (56%)
Baseline Chronic pain	
102(15%)	
Location of Pain	
Extremity	305 (44%)
Neck and back	149 (21%)
Abdomino-pelvic	131 (19%)
Face	70 (10%)
Chest	38 (5%)
Headache	6 (1%)
Opioid prescribed	
Oxycodone-acetaminophen	570 (82%)
Codeine-acetaminophen	123 (18%)
Hydrocodone-acetaminophen	1 (0.1%)
Morphine	5 (1%)
Morphine milligrams equivalents dispensed, median (IQR)	50 (25, 75)

TWO WEEK OUTCOMES	
Worst pain in affected area during previous 24 hours	
Severe	104 (15%)
Moderate	192 (28%)
Mild	167 (24%)
None	190 (27%)
Missing	46
Pain frequency in affected area during previous 24 hours	
Often/ Always	222 (32%)
Sometimes	179 (26%)
Never/ Rarely	253 (36%)
Missing	45

OPIOID OUTCOMES	
Prescription Filled	
No opioid prescription filled	176/699 (25%)
ED prescription filled	390/699 (56%)
At least 2 opioid prescriptions	116/699 (17%)
Persistent use	
Six or more opioid prescriptions in the six months.	17/699 (2.4%)
Association between baseline chronic pain with persistent opioid use.	(OR 3.33, 95%CI: 1.20, 9.21)
Association between pain two weeks after ED visit with persistent opioid use	(OR 5.42, 95%CI: 1.53, 19.21)

No, authors do not have interests to disclose

497 Use of Virtual Reality in Adjunct to Anesthesia in Surgery and Anesthesia Requiring Procedures: A Systematic Review and Meta-Analysis

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Study Objectives: The use of virtual reality (VR) as an anesthetic and augment to standard anesthesia techniques has shown promise for many applications, ranging from pain management to patient satisfaction in the emergency department. A systematic review evaluating the effects of VR on pain, and the amount of anesthesia required in patients undergoing surgery and procedures is yet to be done. The aim of this paper was to perform a comprehensive analysis of the available applications of VR as an adjunct to anesthesia in surgery and anesthesia-requiring procedures and its effect on post-operative/ procedural pain as a primary outcome, and the amount of anesthetic required as a secondary outcome.

Methods: Relevant articles were searched in PubMed and Scopus. The search strategy included keywords like virtual reality, augmented reality, anesthesia, sedation, and regional anesthesia. Clinical trial and observational studies published since inception till July 23, 2023 investigating use of VR in adjunct to conventional anesthesia, and reporting its effect on postoperative pain, the amount of anesthetic required, were screened using Rayyan software. Non original research, pilot studies, study protocols, and non-English publications were excluded. An examination was done of the interventional effectiveness of VR on postoperative/postprocedural pain and the amount of anesthetic required; midazolam was specifically isolated as it was the most consistently reported in the included studies. RevMan

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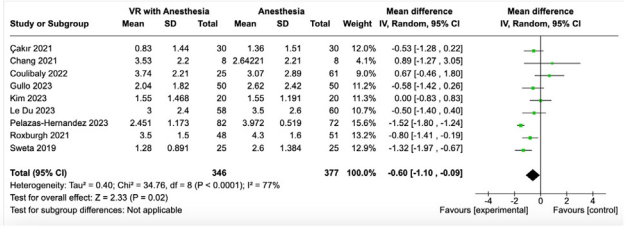
5.0. was used for creating pooled Mean Differences and 95% Confidence Interval (CI). The overall heterogeneity among the studies was assessed.

Results: A total of 2,010 articles were screened, of which 20 were included to extract the data comprising of 1,204 subjects. Out of these a total of 9 studies were included in the meta-analysis for pain outcome and 3 for midazolam use. Surgeries and procedures evaluated included orthopedic, gastrointestinal, and anesthesia administration. Medications used varied between hospitals. Meta-analysis depicted in Forest Plots for pain outcome showed a significant reduction in pain in the VR and anesthesia group (case) in comparison to anesthesia only group (control), with a mean difference of -0.6 [-1.1, -0.09], Z=2.33, P=0.02. Analysis of Midazolam use demonstrated an insignificant decrease in the administered amount of the drug in the case group with a mean difference of -1.37 [-3.94, 1.201], Z=1.04, P=0.30. The values are significant at 5%. Heterogeneity was high (I=77%).

Conclusion: Utilizing VR in adjunct to anesthesia in surgery and anesthesia-requiring procedures has a significant effect in reducing post-operative/procedural pain; however, the clinical effect was small. Future research should investigate the practical impact of VR for improving pain and reducing amounts of anesthetic agents in procedures.

Fig. 2. Meta-analysis of postoperative/ procedural pain outcome.



No, authors do not have interests to disclose

498 Sonographic Pediatric Lung Assessment Shows Hope (SPLASH) in Pediatric Emergency Medicine

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Study Objectives: Non-fatal drownings comprise a significant portion of morbidity and mortality in the United States, especially in the pediatric population. Current management of nonfatal drownings includes prolonged observation up to 8 hours in the emergency department (ED) with conditional disposition based on normalization of vital signs, mentation, and imaging. While chest x-ray (CXR) is one of the most widely used screening tests for interstitial edema, it lacks sensitivity early after submersion. Pulmonary ultrasound has proven to be superior to CXR for the detection of interstitial edema, but with little investigation after submersion injuries. We hypothesize that lung ultrasound will be more sensitive than CXR in identifying early interstitial edema in pediatric patients presenting after nonfatal drownings and serves as a useful screening tool to guide disposition.

Methods: Pediatric patients presenting to the ED following a submersion event were enrolled in the study if they received a CXR as part of their care. A prospective convenience sample of 35 pediatric patients ranging from 1-16 years old were enrolled after their parents consented for study enrollment. Subsequently, patients received a lung ultrasound performed by an emergency medicine resident who was not directly involved in the patient's care. Residents provided a "novice" lung ultrasound interpretation which was independently reviewed by four blinded sonographers for accuracy. CXR reviewed by a radiologist served as the clinical gold standard for comparison to sonogram interpretation.

Results: Lung ultrasound was found to have a sensitivity of 88% and a specificity of 72% for correctly ruling out pulmonary edema in patients that could safely be discharged after a nonfatal submersion. CXR had a lower specificity of 66% in ruling out interstitial edema in discharged children. Out of the 35 patients enrolled in this study, 18 required hospital admission, 3 of which had abnormal ultrasounds with normal CXRs.

Conclusion: Lung ultrasound demonstrated a similar sensitivity to CXR in identifying patients that can be safely discharged after nonfatal drowning events. ED novice performed lung ultrasound was found to be more specific than CXR for identifying early interstitial edema in children who required hospital admission. Bedside ultrasound was a promising diagnostic tool in determining the presence of pulmonary edema and need for admission in pediatric patients presenting to the ED following submersion events.

No, authors do not have interests to disclose

499 Handheld Operators of Cannulation With Ultrasound and Point-of-Care Ultrasound: The HOCUS POCUS Quality Improvement Initiative

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Background: In this quality assurance initiative, we sought to compare handheld ultrasound probes with standard cart-based ultrasound systems in the initiation of peripheral intravenous (IV) catheters.

Material and Methods: Emergency department patients under the care of resident physicians were sorted into two different groups using different ultrasound machines on an every other week basis. Data was collected on the number of peripheral (IV) attempts, time to successful IV placement, patient pain and satisfaction as well as resident perceived difficulty and satisfaction with the procedure.

Results: There was no statistically significant difference in any parameter except for time to successful IV cannulation. The procedure was 90 seconds faster with the handheld unit.

Conclusion: Handheld ultrasound probes allow for faster initiation of ultrasound guided IVs.

No, authors do not have interests to disclose

500 A Multipatient Simulation-Based Program to Train Emergency Medicine Residents in the Rapid Ultrasound for SHock (RUSH) Exam

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Study Objectives: Point-of-care ultrasound (POCUS) is commonly used as a rapid diagnostic tool to assess hemodynamically unstable patients. The Rapid Ultrasound for Shock and Hypotension (RUSH) exam is a protocol that helps physicians at the bedside use a systematic approach to determine POCUS findings consistent with shock. We developed a simulation session to assess emergency medicine (EM) resident learner's POCUS image acquisition, interpretation skills, and comfort utilizing the RUSH exam to determine type of shock.

Methods: A small-group session was delivered to EM residents and facilitated by three faculty with expertise in EM, critical care, simulation, and POCUS. A 10-minute didactic on the RUSH exam and shock was followed by three 30-minute simulated hemodynamically unstable patient stations, each demonstrating one of four types of shock (hypovolemic, cardiogenic, obstructive, or distributive). Groups of 2-3 residents were given a prompt for an unstable patient, obtained a history and physical exam, and described brief interventions to the facilitator guiding the case. The case was then "paused," and learners performed the RUSH protocol on a volunteer standardized patient. As the learners progressed through the RUSH protocol, direct feedback was given by the facilitator on image acquisition. Once image acquisition was accomplished, the facilitator provided pathologic images on a laptop for the exam before moving on to the next POCUS exam. Learners interpreted pathologic images and grouped their findings into one of the types of shock. They then described next steps and how the ultrasound findings changed patient management. We aimed to examine residents' comfort with diagnosing shock using the RUSH exam prior to and after the training with a ten-point Likert scale where 1= least confident and 10= most confident.

Results: Seventeen residents participated in this simulation session with a maximum of 3 learners per case. All residents completed pre- and post-course surveys regarding their confidence in the RUSH exam and shock. Responses were given on a 10-point Likert scale. 35% were Post graduate year (PGY) 1, 23.5% were PGY2, and 41% were PGY3. Learners reported increased confidence pre- and post-course in knowledge of the RUSH exam (6.88± 2.35; 9.24± 0.81), $t(17)=4.45$, $p<0.05$; confidence in POCUS image acquisition, (6.71± 1.99; 8.47± 0.98), $t(17)=5.33$, $p<0.05$; and confidence in diagnosing type of shock using RUSH protocol (6.53± 2.55; 8.58± 0.91), $t(17)= 4.59$; $p<0.05$. Additionally, there was a significant increase in overall confidence utilizing POCUS to help manage undifferentiated shock (6.76±2.12; 8.59±1.14), $t(17) =5.40$, $p<0.05$. While all groups had significant improvement, the PGY1 and PGY2 classes demonstrated the greatest confidence increase by participating in this simulation curriculum.

Conclusion: We created a simulation case based learning experience for POCUS training on image acquisition and interpretation utilizing the RUSH protocol to determine the type of shock in a hemodynamic unstable patient with success in resident learners. PGY1 and PGY2 resident learners had the greatest improvement in confidence utilizing this simulation curriculum which may demonstrate that performing this simulation during the early part of residency training may be most beneficial to EM trainees.

No, authors do not have interests to disclose

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501 Multidisciplinary Simulation-Based Resident Education for High Acuity Low Occurrence (HALO) Obstetric Emergencies

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Study Objectives: The aim of this project was to develop a simulation-based curriculum for Obstetrics and Gynecology (Ob/Gyn) and Emergency Medicine (EM) resident physicians to improve management of obstetric emergencies and strengthen communication and teamwork skills amongst a multidisciplinary team. Many obstetric emergencies require the prompt response of a multidisciplinary team, including EM and Ob/Gyn physicians. With rising maternal mortality rates in the United States, it is more important than ever that teams are prepared for rare yet potentially catastrophic events. Simulation-based education provides a safe learning environment for managing these events (also referred to as high acuity low occurrence [HALO] events), which allows learners to enhance their knowledge, procedural skills, and teamwork skills.

Methods: A curriculum consisting of three case-based simulations was developed by Ob/Gyn and EM faculty. Each case involved a pregnant patient presenting with various obstetric emergencies. 33 Ob/Gyn and Emergency Medicine residents participated in the 3-hour session. Learners ranged from PGY-1 to PGY-4. Residents rotated in small groups through 3 stations: (1) tricyclic antidepressant overdose complicated by cardiac arrest, (2) postpartum cardiomyopathy complicated by cardiogenic shock, and (3) polytrauma resulting from a gunshot wound. Formal debriefing was conducted after each scenario. Surveys were administered to learners before and after completion of the training to assess confidence and knowledge around the topics covered in the curriculum.

Results: 33 residents completed the pre-survey and 25 completed the post-survey. Incomplete surveys were excluded. 22 residents completed both pre-and post-survey. 68.2% of respondents were Ob/Gyn trainees and 31.8% were EM trainees. Survey elements were rated on a 10-point Likert scale. After completing the training, learners reported increased confidence in the ability to diagnose an overdose in an obstetric patient (from 4.86 to 7.41, $t(21)=5.74$, $p<0.05$). Learners also reported increased confidence in ability to perform a resuscitative cesarean section (from 5.64 to 8.36, $t(21)=5.43$, $p<0.05$). Additionally, there was a significant increase in overall comfort in responding to obstetric emergencies (from 6.09 to 7.86, $t(21)=3.89$, $p<0.05$). Finally, 86% of respondents strongly agreed that their knowledge regarding obstetric emergencies was enhanced by participating in this multidisciplinary simulation curriculum.

Conclusion: We developed a high-fidelity simulation-based curriculum for Ob/Gyn and EM resident physicians to provide experience in managing obstetric emergency situations with a multidisciplinary team. Survey results of participants demonstrate that this curriculum was effective at enhancing comfort in managing these rare situations. These results support our efforts to implement multidisciplinary educational initiatives amongst trainees.

No, authors do not have interests to disclose

502 Threading the Needle: Balancing Cost With Procedural Excellence in a Needle Cricothyroidotomy Simulation

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Study Objective: The "can't intubate, can't ventilate" scenario in a pediatric patient is a situation that emergency physicians hope to never encounter. Needle cricothyroidotomy (NC) is a life-saving procedure that, although seldom-used, can establish a temporary airway in this emergency. Teaching this procedure is critical, yet challenging, as most emergency medicine (EM) residents will not perform a real one before completing residency. As a result, simulations are essential for preparing residents for these high pressure scenarios. Unfortunately, commercial NC models are expensive and may not be the most prudent use of a residency budget given the procedure's rarity. The aim of this study is to assess whether a low cost, low fidelity (LF) model is as effective as an expensive, high fidelity (HF) model in increasing EM resident confidence and competence performing a NC.

Methods: The study participants included 17 EM residents (6 PGY1, 5 PGY2, 6 PGY3) at a large academic hospital in New Jersey. To simulate the procedure, a LF model was constructed using basic materials found in the emergency department including an empty glove box, nitrile gloves, medical tape, AMBU™ ventilator tubing and 3M Coban™ costing roughly $10. A HF model was purchased from SimuLab™ for $3,580. Both models allowed for visual confirmation of lung aeration provided successful NC. Residents initially completed a pre-intervention survey assessing confidence with various aspects of the NC procedure. Participants then received standardized NC training using both the HF and LF model with time after to practice on each model once. They then performed a NC on each model and were assessed using a skills mastery checklist consisting of 6 critical actions. A post-intervention survey was provided afterwards assessing confidence, competence, as well as model preference and realism. All data collection tools were derived from existing literature that used a similar intervention-based analysis model. Subjective questions on the surveys were assessed on a 100-point visual analogue scale. Statistical analysis employed paired one-tailed t-tests with an α value of 0.05. Primary outcomes were increase in resident confidence and comparative skill mastery on the HF and LF models. Secondary outcomes included realism scores and model preference.

Results: Post intervention, confidence in performing an NC in a real situation increased by 46.76% ($p<0.001$) among the participants. There was also a mean increase in confidence with several key areas of the procedure including: determining when an NC was indicated (27.94%, $p<0.001$), identifying the cricothyroid membrane (29.12%, $p<0.001$), and recognizing the necessary supplies for an NC (47.06%, $p<0.001$). The mean difference in resident confidence in performing an NC after using the HF compared to the LF model was 2.86% ($p=0.086$). Residents rated the realism of the HF model as 10.59% higher than that of the LF model ($p=0.001$). On the skills mastery checklist, the mean score was 11.00 on the LF model and 10.94 on the HF model with a mean difference of 0.05% ($p=0.386$).

Conclusion: This study demonstrated a statistically significant increase in EM resident confidence with various aspects of performing an NC. While the HF model was found to be more realistic, no statistically significant difference in resident confidence or competence between the 2 models was found. These findings suggest that expensive HF models may not be superior to low cost LF models when teaching rare, vital procedures.

No, authors do not have interests to disclose

503 Evaluating a Novel, Inexpensive Cricothyrotomy Training Technique: A Noninferiority Pilot

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Study Objectives: Simulation is essential to prepare providers to perform cricothyrotomy (CT). Creating an inexpensive (Figure), accessible model is crucial for medical education. Our novel technique adapts an open-sourced 3D printed CT model with common healthcare supplies enabling medical providers to complete more routine simulation of CT while alleviating economic and logistical challenges observed with common simulation methods.

Methods: Residents and fellows of an academic Emergency Medicine (EM) program were randomized to complete a 240-minute training session to establish baseline competency for CT with a training mannequin (Group 1) or our novel CT technique (Group 2). After a two-week washout period, all participants performed a CT on an animal surrogate. EM attendings blinded to group evaluated participants with a standardized checklist. The data collected assessed the primary endpoint of non-inferiority of our technique, as well as time to cuff inflation. 36 participants were needed to establish a non-inferiority margin of 10% between groups with successful completion of CT defined as 90% completion of the standardized checklist using the Mann-Whitney U test.

Results: Group 1 had a median success rate (MSR) of 100% with an interquartile range (IQR) of 86-100%. Group 2 MSR of 100% with IQR of 93-100%. P= 0.42 consistent with noninferiority. For time to cuff inflation, Group 1 had a median time (MT) of 127 seconds (IQR 77-152) with Group 2 having a MT of 57 sec (IQR 44-123).

Conclusion: Our CT training technique did not cross the non-inferiority margin. Suggesting in this population, our technique is a non-inferior training technique, while possessing significant economic and logistical advantages over commonly used techniques. More research is needed to evaluate this technique in medical education and resource-limited training programs.

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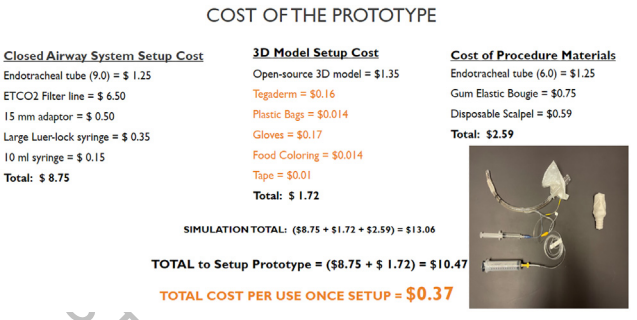

No, authors do not have interests to disclose

504 Comparing Medical Students Experience on Resuscitation Training Between High Fidelity Mannikin and Virtual Reality (VR) Simulation

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Background: The use of virtual reality (VR) simulation in emergency medicine resuscitation training is in its infancy stage. In our department, the use of high fidelity mannikin in team training and resuscitation is well established for over a decade. These highly capable mannikins are able to mimic realistic clinical signs that aid in various aspects of training in skill competency, decision making, teamwork and communications.

Study Objective: This study aims to gather feedback from medical students, comparing the user experience in resuscitation training between that of high fidelity mannikin vs VR simulation.

Method: 4 fourth-year medical students, rotating through the emergency department, underwent resuscitation training using high fidelity mannikin (Laerdal SimMan 3G), followed by VR simulation. The training started with 3 scenarios using mannikin, followed immediately by 2 scenarios using VR simulation. At the end of the training session, anonymous surveys and qualitative feedback was sought from the medical students comparing both training methodologies.

Results: There were 2 male and 2 female students. All had past experience in the use of VR simulation, namely basic orientation to an anaesthetic machine, but none with VR simulation in resuscitation training. Using a Likert scale of 5 (strongly agree, agree, neutral, disagree, strongly disagree), 3 agreed that VR simulation helped in developing team collaboration, communication and decision making while 1 disagreed. 2 strongly agreed that VR simulation prepared them for real-life emergencies, 1 agreed and 1 neutral. On the aspect of VR environment representing realistic real-life situation, 2 agreed, 1 neutral, and 1 strongly disagreed. 2 strongly disagreed that they could concentrate better in the VR environment compared to conventional mannikin, while 1 was neutral and 1 agreed. 75% enjoyed the VR simulation experience. Qualitatively, the students preferred training with the mannikin over VR simulation because they were able to touch and perform procedures with haptic feedback on the mannikin. VR simulation was useful for decision making.

Conclusion: Resuscitation training using traditional high fidelity mannikin and VR simulation have their pros and cons. For medical students early in their professional training, they much prefer performing task training with haptic feedback on a traditional high fidelity mannikin over VR simulation. VR simulation has strength in team training, remote training and decision-making training. These training pedagogies would complement each another. There is a need to continue development in VR simulation, especially in areas of providing haptic feedback, to fulfil these training needs.

No, authors do not have interests to disclose

505 Disparity in Guideline Adherence for Prehospital Care According to Patient Age in Emergency Medical Service Transport for Severe Trauma

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Study Objectives: The aim of this study was to investigate the association between patient age and guideline adherence for prehospital care in emergency medical services (EMS) for severe trauma.

Methods: This was a retrospective observational study that used a nationwide EMS-based trauma database from 2016 to 2019. Adult major trauma patients whose injury severity score was greater than or equal to nine were screened, and those with cardiac arrest or without outcome data were excluded. The enrolled patients were categorized into four groups according to patient age: young (<45 years), middle-aged (45-64 years), old (65-84 years), and very old (>84 years). The primary outcome was guideline adherence, which was defined as following all prehospital care components: airway management for a level of consciousness below verbal response, oxygen supply for pulse oximetry under 94%, intravenous fluid administration for systolic blood pressure under 90 mmHg, scene resuscitation time within 10 minutes, and transport to the trauma center or level 1 emergency department. Multilevel multivariable logistic regression was conducted to calculate the adjusted odds ratios (aORs) and 95% confidence intervals (95% CIs).

Results: Among the 430,365 EMS-treated trauma patients, 38,580 patients were analyzed—9,573 (24.8%) in the young group, 15,296 (39.7%) in the middle-aged group, 9,562 (24.8%) in the old group, and 4,149 (10.8%) in the very old group. The main analysis revealed a lower probability of guideline adherence in the old group (aOR 95% CI=0.84 (0.76-0.94)) and very old group (aOR 95% CI=0.68 (0.58-0.81)) than in the young group.

Conclusion: We found disparities in guideline adherence for prehospital care according to patient age at the time of EMS assessment of severe trauma. This should be considered when develop detail protocol for prehospital severe trauma management and training EMS providers to improve the patient's outcome.

No, authors do not have interests to disclose

506 Implementation and Evaluation of Rapid Ultrasound for Shock and Hypotension Protocol Training Course in Kuwait: A Pilot Study

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Study Objectives: The Rapid Ultrasound for Shock and Hypotension (RUSH) protocol is a vital tool in emergency medicine, aiding both emergency physicians and critical care physicians in rapidly identifying the underlying causes of shock in hypotensive patients. Undifferentiated shock causes a challenge in the emergency department, necessitating prompt diagnosis to tailor interventions effectively. The RUSH protocol offers a systematic approach using ultrasound, categorizing shock etiologies, and integrating cardiac, pulmonary, abdominal, and venous examinations. It is readily accessible as a noninvasive and easily teachable skill, encompassing evaluations of the cardiac, vascular, thoracic, and abdominal regions. Many studies have highlighted its efficacy in real-time visualization and intervention for treatable causes. This study aims to implement a comprehensive RUSH protocol ultrasound workshop to enhance emergency physicians' (EPs) and healthcare workers' (HCWs) competence and confidence in performing and interpreting the exam, ultimately optimizing patient care and outcomes.

Methods: A comprehensive full-day structured RUSH protocol ultrasound workshop was developed, including didactic lectures, live demonstrations, and hands-on practice sessions. Over a two-year period, six workshops were conducted for EMPs and HCWs from various specialties within Kuwait's Ministry of Health. A total of 89 participants, in which 85 of them are emergency physicians, completed pre- and post-course questionnaires assessing their confidence in applying the RUSH protocol, using a 5-Point Likert Scale. Data analysis involved two methods: two-sample paired t-tests for means and the difference method, examining pre- and post-course scores and net changes, respectively.

Results: The structured RUSH protocol workshop led to a significant improvement in participants' confidence levels in performing and interpreting the RUSH protocol. Pre-course mean confidence scores increased from 2.75 to 4.17 post-course ($p<0.001$; SD 1.11 pre-course and 0.787 post-course) for performing the RUSH exam unsupervised, resulting in a net gain of 1-2 points on the Likert scale (31.5% for 1 point increase and 27% for 2 points). Similarly, confidence in image interpretation improved from a pre-course mean score of 3.34 to 4.03 post-course ($p<0.001$; SD 1.119 pre-course and 0.818 post-course), yielding a net gain of 0-1 points (32.6% and 28.1%, respectively). Furthermore, participants' confidence in utilizing the RUSH exam for diagnosing hypotensive patients increased from a pre-course score of 2.72 (SD 1.076) to 4.29 (SD 0.757; $p<0.001$) post-course, resulting in a net gain of 1-2 points on the Likert scale (29.2% each).

Conclusion: The implementation of a structured single-day RUSH protocol workshop in Kuwait has significantly improved EMPs and HCWs' confidence in applying the protocol to efficiently manage patients with undifferentiated shock. These findings highlight the importance of educational interventions in enhancing clinical

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skills and potentially improving patient care outcomes. Further research and broader implementation of similar training programs are essential to fully assess their impact in emergency medicine practice.

No, authors do not have interests to disclose

507 Predictive Value of the 8-Zone Scanning Protocol Point-of-Care Lung Ultrasound for Outcomes of Filipino Patients With COVID-19 Illness: An Analytical Cross Sectional Study

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Background: Coronavirus Disease 2019 is an infectious disease caused by the Severe Acute Respiratory Syndrome Coronavirus-2 that was declared a pandemic in early 2020. Point-of-care lung ultrasound was used in many settings as an alternative tool to diagnose and prognosticate COVID-19 disease due to its easy accessibility in the emergency department.

Study Objectives: The main objective of this study was to determine the predictive value of the 8-Zone Lung Ultrasound (LUS) scoring protocol for respiratory failure and mortality among Filipino COVID-19 patients. The presence of correlation between LUS, demographics, clinical characteristics, laboratory findings with clinical deterioration to respiratory failure and death were also determined.

Methods: A retrospective analytical cross-sectional study was done among COVID-19 patients seen and managed in the emergency department of St Luke's Medical Center-Quezon City from November 2020 to November 2021. A total of 129 patients were included in the study analysis. Archived lung ultrasound clips of enrolled patients were retrieved and reviewed. LUS determination was accomplished separately by the senior POCUS consultant and the assistant POCUS coordinator.

Results: Receiver Operator Characteristic (ROC) curve analysis yielded an LUS cut-off score of 10.5 for predicting intubation with 98% true positive rate and 18.5% false positive rate, and a cut-off score 12.5 for predicting mortality with 93.5% true positive rate and 35.8% false positive rate. The Area Under the Curve (AUC) values for predicting intubation and mortality were 0.928 and 0.880, respectively, indicating the reliability of lung ultrasound in predicting both the need for endotracheal intubation and mortality among COVID-19 patients. The inter-rater reliability score of 0.885, obtained using intraclass correlation coefficient, indicated a good reliability. Using binary logistic regression, severe respiratory symptoms, elevated levels of LDH and decreased pH values were revealed to be associated with higher LUS scores and were identified as both predictive of respiratory failure and mortality in COVID-19 patients.

Conclusion: The 8-zone lung ultrasound score protocol is a reliable predictor of COVID-19 prognosis as it is significantly associated with endotracheal intubation and 28-day mortality. The utility of the shorter 8-zone LUS protocol allows physicians for shorter evaluation of COVID patients without losing prognostic value.

No, authors do not have interests to disclose

508 Implementation of a Palliative Care Curriculum for Emergency Medicine Residents

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Study Objective: Half of Americans visit the emergency department (ED) in their last month of life, and 75% in the last six months. As many patients may require urgent interventions, it is imperative emergency physicians be able to quickly align with patients to determine values and offer recommendations. Emergency physicians often practice in environments without readily available palliative care specialists and therefore need to have primary palliative care skills to provide holistic care to those with chronic/terminal illness. Emergency physicians have reported primary palliative care as an important competence in their practice, yet they feel inadequately prepared in this area. Our specific aim was to develop a primary palliative care curriculum for emergency medicine (EM) residents and evaluate if this curriculum improved residents' knowledge, level of comfort, and perceived application of skills in caring for patients with chronic and/or terminal illness in the ED. We also aimed to determine if EM residents find primary palliative care education important and to determine which modalities are most effective to learn palliative care knowledge and skills.

Methods: A curriculum was developed and consisted of four didactic sessions, a communication skills lab using standardized patients, and a small group simulation case using a high-fidelity manikin. The study population was EM residents in all levels of training at a single site. Data was collected via pre- and post-intervention surveys using Likert Scale questions to capture residents' perceived ability of each component. To conduct a statistical comparison, Likert scale items were converted to corresponding numerical values. Distribution was assessed for normality via Shapiro-Wilks Test, and all variables were found to be not-normally distributed, leading to the use of the non-parametric equivalent of the paired t-test, the Wilcoxon Signed-Rank Test. A p-value of <0.05 determined significant difference in Likert scores pre- versus post-intervention.

Results: 41 residents participated in this study. The Table displays survey data with medians and interquartile ranges. Survey items 3-12 were found to have statistically significant improvement in perceived ability pre- versus post-intervention. These items evaluated ability to determine decision making capacity, have goals of care discussions, interpret advanced directives, treat symptoms associated with the active dying process, effectively negotiate decision making, treat refractory symptoms associated with chronic/terminal disease, perform effective acute pain management, effectively communicate bad news, differentiate between hospice and palliative care, and initiate contact with palliative and/or hospice care teams. Results evaluating learning modalities showed residents felt lecture, small group discussion, and simulation were all effective education tools. 29.27% felt neutral, 65.85% agreed, and 4.88% strongly agreed that lectures were an effective tool. 7.32% felt neutral, 48.78% agreed, and 43.9% strongly agreed that small groups were an effective tool. 9.76% felt neutral, 36.59% agreed, and 51.22% strongly agreed that simulation was an effective tool.

Conclusion: This palliative care curriculum for EM residents did improve residents' knowledge, level of comfort, and perceived application of skills in caring for patients with chronic and/or terminal illness in the ED. EM residents did find primary palliative care education important. Lecture, small group discussion, and simulation were all found to be effective modalities to learn palliative care skills, and the strongest preference was for simulation and small group discussion.

Table 1: Wilcoxon Signed-Rank Test Results for Likert Scale Survey Questions

Survey Item	Pre-Test Median Score (Interquartile Range) N = 41	Post-Test Median Score (Interquartile Range) N = 41	Wilcoxon Signed-Rank P-Value
1. Emergency Medicine has an important role in providing palliative care	5 (4-5)	5 (4-5)	1
2. Palliative care education is important in Emergency Medicine residency	4 (4-5)	4 (4-5)	0.8333
3. I feel confident in my ability to determine a patient's decision-making capacity	4 (3-4)	4 (4-5)	<0.0001*
4. I feel confident in my ability to have goals of care discussions with my patients/surrogates	4 (3-4)	4 (4-5)	<0.0001*
5. I feel confident in my ability to interpret advanced directive forms (POLST, surrogate decision maker, living will, etc.)	3 (2-4)	4 (4-4)	<0.0001*
6. I feel confident in my ability to manage symptoms associated with the last hours of living	3 (2-3)	4 (3-4)	<0.0001*
7. I feel confident in my ability to effectively negotiate decision making with patients and families regarding risks, benefits, and alternatives when patients present with chronic or terminal illness	3 (2-3)	4 (4-4)	<0.0001*
8. I feel confident in my ability to treat refractory symptoms associated with chronic/terminal disease	2 (2-3)	4 (3-4)	<0.0001*
9. I feel confident in my ability to perform effective acute pain management in patients with palliative care needs	3 (2-4)	4 (4-4)	<0.0001*
10. I feel confident in my ability to effectively communicate bad news including death disclosure, errors, unexpected outcomes, and other challenges while caring for patients with life-limiting illnesses and those at the end of life	3 (2-4)	4 (4-4)	<0.0001*
11. I understand the difference between hospice and palliative care and the resources each provides to patients	3 (2-4)	4 (4-5)	<0.0001*
12. I feel confident in my ability to initiate contact and involve palliative and/or hospice care teams to optimize care for patients in the ED	2 (2-3)	4 (4-4)	<0.0001*

No, authors do not have interests to disclose

509 Improving on Shift Teaching: You Otter Know

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Study Objective: Bedside teaching in the emergency department has become increasingly challenging due to the impact of boarding, higher acuity and volumes, and staffing shortages. With the increasing demands of attendings and trainees, finding time to educate is progressively more difficult to prioritize while managing critical patients and clearing the waiting room. While Post-It Note Pearls have been effective, they are often discarded after the shift or not widely shared. Our goal was to create a method for on-shift teaching during times of high volume and acuity.

Methods: We introduced the "Otter Box" on the Attending desk, containing colored notecards and Sharpies. Residents were assigned essential Emergency Medicine topics or case-based information to teach back to the attendings using visual aids and diagrams. The cards were stored in the box for use when formal teaching was not available and were also accessible at other teaching sites and via Instagram @YouOtterKnowCards.

Results: After 6 months, surveys were sent to residents and attendings. Residents provided positive feedback, reporting that they used the cards offline. Internal and external learners utilized the Instagram page from our department. However, attendings were less inclined to use or assign the cards due to time constraints and lack of knowledge about topics to assign.

Conclusion: To improve rates of use, we plan to increase advertising and reminders about the teaching resources. A how-to poster will be created to promote the cards, and a list of suggested topics will be included in the boxes to help with decision fatigue. We also aim to encourage residents to assign cards to medical students, who may have more downtime on shift.

Significance: Having these cards available through Instagram or as hard copies at the desk will provide quick and simple teaching points when detailed lectures are not feasible. Visual learning aids in retention and involving residents and medical students in creating content promotes ownership of their education.

No, authors do not have interests to disclose

510 Long COVID: Predictive Factors and Prevalence in Population

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Background: After weeks and months of a COVID-19 infection, many individuals suffer from specific symptoms. This disease is becoming a global problem and is limiting people's lifestyles. The collection of signs and symptoms experienced by individuals for an extended period after their initial recovery from COVID-19 is commonly referred to as Long COVID (LC). It is important to investigate one or more predictive factors of this disease in a heterogeneous cohort of patients, who suffer from several comorbidities, have different vaccination status, and have contracted different variants of Sars-Cov-2.

Study Objective: The study aims to identify predictive factors of LC and evaluate its prevalence, including vaccination status and comorbidities, to reduce incidence.

Methods: We conducted a monocentric, observational, and retrospective study at Fondazione Policlinico Universitario Agostino Gemelli – IRCCS in Rome. We enrolled patients admitted to the emergency department (ED) between March 2020 and December 2022, over the age of 17 with Sars-CoV-2 infection confirmed by an antigen and PCR tests performed on oropharyngeal and/or nasopharyngeal swabs. Among all patients, we excluded patients with COVID-19 and other prevalent acute conditions affecting prognosis and patients who died in the ER. We contacted patients by phone to collect data on symptom persistence after acute SARS-CoV-2 infection and their likely duration.

Results: We enrolled 342 patients, of which 218 were male and 124 were female. Of the 342 patients we examined, 131 were found to be affected by long covid (LCP), while 211 were non-long-covid (NLC). Most of the demographic characteristics did not reach statistical significance, except for gender. The LCPs were 48.8% female while NCL were 28.4% (p=0.0001). No statistically significant difference was found when comparing comorbidities, laboratory findings, and vaccination status, except for domiciliary therapy: anticoagulants were reported in 83.9% of LCP and 73.9% of NLC (p=0.03). The main statistically significant differences concern the administered therapy between the two groups: corticosteroids were given to 68.7% of LCP versus 57.8% of NLC (p=0.04), Remdesivir was reported in 38.2% of LCP and 25.1% of NLC (p=0.01), and monoclonal antibodies were administered in 12.2% of LCP and 4.7% of NLC (p=0.02). In the multivariate analysis, we evaluate the statistically significant differences between the LCP and NLC. The variables significantly correlated to the onset of long-covid were the female sex, the values of D-dimer, the hospitalization time, and therapies with remdesivir and monoclonal antibodies.

Conclusions: It appears that being female and having a longer hospitalization time may increase the likelihood of experiencing long COVID. Additionally, the D-dimer test could potentially act as a predictive marker for long COVID, possibly due to its association with a pro-inflammatory state, which could be one of the underlying factors of the disease. Therapies involving the use of remdesivir and monoclonal antibodies may also be risk factors.

No, authors do not have interests to disclose

511 Infectious Disease Podcasts for Users of the CMES Program

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Background: Techies Without Borders (TWB) is a non-profit organization that aims to deliver high-quality continuing medical education (CME) to low- and middle-income countries (LMIC) where there are significant cost and internet access barriers for clinicians to stay up-to-date. The program is currently established in 18 LMIC, serving 5,000 doctors who care for 10,000,000 patients. TWB delivers content via the CME on Stick (CMES), a USB device, and the CMES-Pi, which downloads content from a cloud-based server each month, including podcasts and written summaries. The Pi syncs with a customized phone application that allows users to download content without using their data Feedback from users suggests that tropical infectious disease (ID) content on our server relevant to LMIC is limited. IDs are the most common causes of death in these parts of the world. There is also a publication disparity between the global North and global South. In response, TWB is developing a podcast mini series - " **I**nfectious **D**isease **P**odcasts for **U**sers" (ID4U) - interviewing expert physicians from CMES partner sites, and these podcasts will be uploaded to the CMES server. The dual purpose for this project is to tailor the content on the CMES server to the needs of our users and to provide digital scholarship opportunities for our partners in the global South.

Study Objectives: After listening to this podcast series and reviewing the written summaries, CMES participants will accomplish the following: Describe key components of the emergency management of the critically ill patient with tuberculosis (TB); List first-line antibiotics in the treatment of TB (*this will be region-dependent*); Describe key components of the emergency management of the critically ill patient with malaria; List first-line antibiotics in the treatment of malaria (*this will be region-dependent*).

Methods: In 2024, 10 podcasts will be produced, The episodes and written summaries will be uploaded to the CMES server. Likert-scale surveys will gauge user satisfaction and guide future improvements.

Results: Survey results are currently pending podcast production and dissemination. We hypothesize that CMES users who respond to a post-implementation survey will respond positively to Likert-scale questions regarding the ID4U podcast series, where "positive" is defined as a score of 3 or 4 on a 4-point Likert scale.

Conclusion: The CMES program aims to provide access to high-quality CME in resource-constrained settings. Unfortunately, current tropical ID content is lacking on our server. The ID4U project aims to improve accessibility of tropical ID CME to program users while also creating a digital scholarship opportunity for clinicians from LMIC.

No, authors do not have interests to disclose

512 Critical Care Documentation Basics: An Educational Initiative to Support Quality Improvement

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Study Objectives: Suboptimal critical care documentation fails to accurately demonstrate the importance and complexity of care provided by emergency physicians (EPs). Optimal documentation requires familiarity with current billing or coding standards that are not consistently taught across educational and practice settings. We created an education curriculum to increase EP's knowledge and understanding of

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optimal critical care documentation, including (1) recognizing scenarios that should be documented as critical care; (2) recognizing care components that support critical care documentation; and (3) being able to appropriately document critical care. The primary objective of this study was to assess the effect of our critical care educational curriculum on EP knowledge. Our secondary objective was to assess EP satisfaction with the critical care curriculum.

Methods: We created an interactive online educational course using a blended educational strategy approach with didactic, interactive, gamified, and case-based methods. This included sorting games and flash cards to reinforce the main learning objectives. Specific cases were presented, and EPs were then asked if the case qualified for critical care billing. They were then asked to sort the specific activities and provisions in the case to those that counted and did not count towards the minimum critical care billing time. Lastly, appropriate and efficient ways to document were demonstrated for each case. Participants received 1.5 CME credit hours for completing the course. EPs were asked to complete identical pre- and post-tests that assessed critical care billing knowledge, as well as a post education survey. Pre- and post-test responses were compared with paired T-tests. The 6-question post curriculum survey used a 5-item Likert scale to gauge learner perspectives on the course's effectiveness, comprehensibility, and subjective confidence.

Results: Thirty-three EPs from Prisma Health – Upstate (total: 166 EPs) took the pre-test, and 27 (81.8%) completed the post-test. The majority were male (65.4%) with a mean age of 43.4 years with a range of 31-67 years. The mean years of practice was 13.9 years with a range of 1-34 years. The average pre-test score was 6.97/10 (n=33). The average post-test score was 8.96 (n=27). On average, there was an increase from pre- to post-test scores of 2.11 points ($p<0.0001$). Of the 27 individuals that took the post education survey, 96.3% agreed that the course increased knowledge and understanding of critical care billing. On average, 91.35 % agreed that the learning objectives were met. Most participants' confidence in critical care billing increased (96.3% agreed). Lastly, 100% agreed that this course was a good way to teach critical care billing.

Conclusion: Our education curriculum significantly improved EPs' knowledge and understanding of critical care billing. EPs who completed the course felt that it improved understanding of and confidence in critical care documentation. Most were satisfied and thought the course was a good way to teach critical care billing. Further evaluation of coding or billing outcomes overtime will be needed to help determine whether this educational intervention also contributed to improved documentation accuracy. Positive initial results indicate this is a good educational intervention candidate going forward.

No, authors do not have interests to disclose

513 Left-Handed Central Line: The Right Way Is Not Always Right

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Background: Central line placement is an ACGME Key Index Emergency Medicine procedure. At the onset of Emergency Medicine training, learners are given instruction on central line placement including room set-up, positioning, ultrasound use and execution. For left-handed learners, the set up and positioning for certain procedures differs from right-handed learners. Without left-handed instruction, our left-handed learners struggle to find their way. From set-set up, where to put the tray and how to position their hands, they felt unsure. When right-handed colleagues were queried, they would tell them to do it their way or just use your right hand. There are very few instructional videos on the web. Several left-handed residents struggled to learn procedures during training related to their handedness during the last 2 academic years. We discuss the struggles they faced and created a learning module to assist left-handed learners develop their skills. The module will serve as a foundation for their procedural learning, initially focusing on central lines.

Study Objective: To create a learning module tailored to left-hand dominant learners (LHDL) for central lines.

Methods: *Design:* We developed an instructional module on central line placement for left-hand dominant learners. The module has two parts. Part 1 contains two videos on central line placement for internal jugular and femoral approaches that were produced and included in the module. It describes procedure and room set up for the left-handed learner as well as procedural approach and execution. Part 2 includes written instructions detailing some of the specific struggles that left-handed residents face and guidance to overcome them. The learner will take a pre-test and is expected to read the written portion as well as watch the videos prior to procedure labs or performing the procedure on a patient. The learner will then take a post-test to evaluate their experience. The left-handed learner will be evaluated using standard procedural evaluation form. The form will be filled out by senior faculty. The same form will be used for both right and left-handed learners. The goal is procedural competence. The pre- and post-tests will evaluate the learner's level of preparedness before beginning the module and after completion of the module and procedure performance.

Conclusion: We have developed a module for future left-hand dominant learners to make it easier for the to acquire the skill of central line placement. The module will be offered to all left-hand dominant learners during the upcoming academic year.

No, authors do not have interests to disclose

514 Impact of a Residency Run Podcast on Knowledge Retention and Attitudes Among Residents and Attending Physicians

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Study Objectives: This prospective cohort study aims to evaluate the effectiveness of integrating a weekly emergency medicine (EM) residency curriculum-based podcast as an educational tool. The study seeks to: Assess the impact of the podcast on knowledge retention among EM residents compared to a standard written summary through pre and post-intervention quizzes; Evaluate residents' and attendings' attitudes to the podcast intervention as an adjunct to medical education; Investigate changes in perceived impact and learning habits among residents and attendings after the implementation of the podcast intervention; Gather residents' and attendings' opinions on the podcast using narrative feedback through open-ended questions.

Methods: To be conducted at Maimonides Medical Center, this single-center study spans six months, commencing in August 2024. The study involves PGY1-3 Emergency Medicine Resident Physicians (n = 54) and Emergency Medicine Attending Physicians (n = 20) as the primary intended learners. Secondary intended learners include those involved in emergency medical education research. The study unfolds in three parts: Part 1 (2 months) uses the standard conference setup (ie, weekly dedicated time to lectures/small group learning and providing written summaries to all after) with pre and post-quizzes, Part 2 (2 months) introduces the podcast-based intervention with pre and post-quizzes, and Part 3 (1 month) offers both written and audio summaries. Surveys assessing demographics, study habits, and podcast- related questions are distributed one month before and at the end of the study period, comparing preferences and perceptions. The pre and post-quiz scores will also be compared through a non-parametric test such as a paired t-test as well as looking for effect size of the intervention. Data will be collected through RedCap (online survey program) which include pre- and post-assessments, Likert scale surveys (5 point scale), and open-ended questions.

Results: Anticipated outcomes include improved knowledge retention, evidenced by higher quiz scores with the podcast intervention, and increased satisfaction and perceived impact on learning among residents and attendings. Quantitative analysis will focus on pre and post-intervention scores and Likert scale surveys, examining correlations with standard summaries and podcasts. Qualitative analysis will focus on a phenomenological approach to open-ended questions.

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Conclusion: This study aims to contribute valuable insights into the efficacy of an original residency-based podcast curriculum for emergency medicine residency programs. If successful, the podcast intervention could serve as a model for enhancing learning retention for residents and satisfaction among residents and attendings. The findings may inform the integration of individual program produced podcasts into formal curricula, addressing a current gap in the literature on optimal podcast structures and higher-level learning outcomes in graduate medical education.

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515 ECG Jeopardy: Use of an Institutional ECG Database for Curricular Design

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Background: ECG Interpretation is a challenging concept for physicians at all training levels. A 2020 meta-analysis of 78 studies described the median accuracy of 54% on pretraining assessments compared to 67% on post training assessments across all training levels. Medical students had a much lower pooled pretraining accuracy of 42%. More recent studies have shown learners felt their ECG training in medical to be inadequate. Some of these studies identified case-based training as crucial for achievement of ECG interpretation proficiency. The goal of this instructional module is to provide example-based education in a gamified format to increase the perceived comfort of fourth year medical students (MS4s) with ECGs prior to intern year.

Study Objectives: 1) By the end of ECG Jeopardy, MS4s will be able to identify and interpret 25 common dysrhythmias and life-threatening clinical disorders demonstrating improved comfort with ECG tracings compared to before the session. 2) Upon completion of the seminar, students will develop proficiency in formulating clinical interpretations and management plans based on ECG findings including when utilize an AED device, how to manage hyperkalemia and when to activate the catheterization lab.

Methods: A list of 95 ECG features was generated based on the ABIM ECG testing schema and was reviewed by experts in cardiovascular emergencies. Of those, 25 ECG features were selected based upon cross referencing an institutional medical student curriculum and common tracings relevant to ACLS. Hundreds of ECGs were reviewed and screened in a large quaternary care center's digital ECG database and premier examples of the listed ECGs were selected. An online opensource template for the Jeopardy! game was used. ECGs were sorted and inserted into the template based on the following categories: syncope, AED management, ACLS arrythmias, Ischemia and life-threatening clinical disorders. Relevant clinical information and learning points were included following each Jeopardy slide. This gamified teaching tool was used in an intern bootcamp session, "Transition to Residency" (TTR). Three 45-minute TTR seminars were held at the end of March for a cohort of 113 MS4s. A series of pre- and post- questions on a 5-point Likert scale was administered to determine how the session affects medical student comfort for interpreting ECGs in the categories listed above.

Results: Of the 113 MS4s, 94 took the pre-session survey and 76 took the post-session survey. In each 45-minute session, approximately 15 out of the 25 ECGs were reviewed in each session. Prior to the seminar, overall comfort with ECGs was polled for. Only 38% of students responded with being 'more or less' comfortable (36%) or 'very comfortable' with ECGs (2%). After the seminar, the aggregate percentage increased to 72%, with 51% reporting 'more or less comfort' and 21% reporting 'very comfortable' respectively. The quality of the ECGs shown were assessed on a 10-point scale and scored an average of 8.5.

Conclusion: ECGs can be technically challenging to interpret without significant exposure. An ideal window for improving comfort with ECG interpretation occurs during the transition from medical student to intern. It is possible to create a targeted ECG curriculum using examples from a quaternary care institutional ECG database. Gaining additional exposure to foundational and life-threatening ECGs can increase the comfort level of students as they progress to interns; however, there are limitations to what can be accomplished in a short seminar and additional data is needed.

No, authors do not have interests to disclose

516 Ultrasound Education in EMT Courses

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Study Objective: Serve as an introductory level session for new emergency medical technicians (EMTs) during their basic training on the purpose and application of e-FAST ultrasound.

Background and Methods: This bi-modal educational session was developed to serve as an introduction to the general concept of ultrasound and the basic application of e-FAST in the field for EMTs. Virginia Beach Emergency Medical Services is the largest volunteer based emergency medical services (EMS) program in the nation, compromised of volunteer EMTs and career staff paramedics. Some of these volunteer professionals are retired healthcare or emergency response providers with varying levels of experience, however the majority are community members such as college students, teachers, etc with no formal education in healthcare. Thus, they undergo an intensive training program and supervised field experience prior to being released for duty. Hypotensive patients pose a significant challenge in the initial management of suspected hemorrhagic shock for a new EMT. One tool that is commonly employed in the evaluation of shock in the emergency department is ultrasound. This can be translated into the field with handheld ultrasound probe technology. If we can show the applicability of ultrasound to new trainees, we suspect they will be more likely to consider its use and further training. Paramedic supervisors have also started carrying whole blood with them in their response vehicles to begin emergent transfusions in the field en route to the nearest facility for hypotensive bleeding patients. If we can expand this training to include a wider variety of providers, ultrasound can be incorporated to further justify starting whole blood transfusions improving care of critically ill patients in the pre-hospital setting.

Results: For this program, there is an initial large group educational slide deck presented to approximately 40 trainees. The purpose of this is to give an overview that is tailored to pre-hospital providers on basic concepts of ultrasound, purpose and role of the e-FAST exam, probe placement, examples of positive and negative views, and how a positive e-FAST changes management of the patient. Afterwards, the group will split into small groups where they will have multiple sessions to practice ultrasound skills and reinforce recognition of positive versus negative scans. Trainees will demonstrate initial level of competence using an ultrasound probe to perform an e-FAST by scanning one another. This will be supervised by volunteer emergency medicine attending physicians who will evaluate the images obtained and provide feedback on techniques.

Conclusion: There will be a pre-intervention quiz that will be scored on accuracy of recognition of positive or negative components of the e-FAST ultrasound exam. Emergency medicine attending physicians will proctor the small group sessions to evaluate image optimization skills and provide feedback. Trainees will have a post-intervention quiz once again scored on accuracy of positive or negative e-FAST images shown.

No, authors do not have interests to disclose

517 Implementing a Legal Medicine Curriculum Into Resident Didactics

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Study Objectives: This curriculum will introduce Emergency Medicine (EM) residents, non-EM residents engaging in EM residency didactics, and rotating medical students to fundamental legal concepts in the daily practice of medicine. Specific attention will be given to: 1) Emergency Medical Treatment and Active Labor Act (EMTALA) 2): Consent and refusal of care 3): Medical malpractice litigation, and 4) Regulatory Agencies.

Methods: This curriculum will be a four-part didactic series with a multi-modal approach to instruction having the following deliverables: 1) EMTALA: Element will include a 20-min lecture on key features of this law. By end of session, participants will be able to describe the responsibilities of participating hospitals & providers (including on-call providers and receiving facilities), and will be familiar with consequences of non-compliance with this federal mandate. A 30-min case-based practice session will follow in which participants will as a group identify EMTALA breaches within presented cases. Pre- and post- tests will assess participant achievement of learning objectives. 2) Consent & AMA: Element will include a 20-min lecture on the key features of consent and will present strategies for risk mitigation in the case of a patient leaving against medical advice (AMA). A 40 minute practice session will follow in which participants will break into small-group huddles. By end of session, participants will determine, in a given scenario, if a patient has capacity, and will describe appropriate counseling for risk/benefit/alternative discussions of common Emergency Department scenarios (eg, blood & procedural consent). Participants will also appropriately counsel the patient leaving AMA. Pre- and post- tests will assess participant achievement of learning objectives. 3) Medical Malpractice litigation: Element will include a 60-min lecture on the anatomy and timeline of a malpractice lawsuit. Following this instruction,

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participants will be able to: define key terms related to legal proceedings, ie, duty to treat, breach, proximate cause, damages; describe the role of participating entities in a medico-legal proceeding, ie, malpractice insurance carrier, codefendants, hospital risk management, etc; describe alternative ways of resolving lawsuits, ie, negotiation, mediation, arbitration, or pre-trial screening panel; understand the typical timeline of a medical malpractice lawsuit. Element will culminate in a 60- min mock deposition. Post-intervention Likert scale survey will be used to assess participant level of concern for malpractice litigation and comfort with deposition process pre- and post- intervention. 4) Interaction with Regulatory Agencies: Element will include a 40-min lecture on medical board complaints. Following this instruction, participants will be able to: describe the key differences between medical malpractice lawsuits and medical board complaints; describe the implications that medical boards actions can have on physician practice. Pre- and post- tests will assess participant achievement of learning objectives.

Results: This curriculum will be administered during the 2024-2025 academic year. Anticipated results of this intervention are performance improvement in post-intervention knowledge assessments for elements 1, 2, and 4 as well as improved comfort level with deposition & medical malpractice lawsuits.

Conclusions: This module introduces to undergraduate and post-graduate learners a curriculum that reviews key legal concerns which impact the daily practice of Emergency Medicine.

No, authors do not have interests to disclose

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