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Fall 2018 The American College of Osteopathic Emergency Medicine (ACOEP) FOEM Competition Abstracts (October 22, 2018)

The Foundation for Osteopathic Emergency Medicine (FOEM) promotes research and graduate medical education to advance the science of patient centric holistic emergency care consistent with the osteopathic philosophy. Each year the FOEM hosts a number of research competitions that are presented at the American College of Osteopathic Emergency Physicians (ACOEP) fall scientific assembly and spring seminar. The *Western Journal of Emergency Medicine (WestJEM)* annually sponsors the research paper competition at the fall scientific assembly and is considered the premier research award at the competition. This *WestJEM* issue highlights FOEM research presented at the 2018 ACOEP Fall Scientific Assembly.

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1 Reducing Substance Use by an Emergency Department Intervention

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Introduction: Substance use and misuse is prevalent in emergency department (ED) patients. We set out to determine substance use reduction rates after a brief ED intervention for patients with tobacco, alcohol, or drug use.

Methods: In this pilot prospective study, we approached a convenience sample of subjects in 2 EDs in PA during scheduled provider nonclinical times. One site was a trauma center while the other was a smaller community hospital. Subjects had to be ≥ 18 yo, have capacity to answer survey questions and participate in the program interventions, could not be critically ill, and had to be willing to participate. Participating subjects admitted to definitions of unhealthy use of one or more of: tobacco products, alcohol, street drugs, or addictive prescription drugs. Subjects received a structured survey and intervention tool that was previously validated (Project ASSERT), a brief intervention based on motivational interviewing, and referral to treatment, which took on average 5-10 minutes¹. The intervention was carried out by a medical student, Emergency Medicine (EM) Resident, or an Addiction Recovery Specialist (a licensed social worker and certified recovery specialist with lived substance use disorder experience). These providers had training in Project ASSERT prior to the study start. Phone follow-up was used to determine current substance use by the patient. Subjects received no financial incentives.

Results: One-hundred ninety-one patients were recruited (105 for tobacco usage, 54 for alcohol, and 32 for drugs). At follow-up, 16/105 tobacco users (15.0%) reported stopping smoking, 51 (48.6%) a decrease in the number of cigarettes per day, and 32 (30.5%) attempting to quit. Of 54 patients in the high-risk alcohol utilization group, 40 (74.1%) reported either a decrease in the number of days per week of drinking, or a decrease in the number of drinks per day. Of the 32 patients who used drugs, 25 (78.1%) reported a decrease in usage.

Conclusion: In this pilot study involving medical students, EM residents and drug counselors at 2 EDs, we found that a brief intervention to patients with unhealthy tobacco, alcohol, and drug use resulted in overall decreased use. A more robust study, with a larger patient sample size is indicated.

2 Teamwork Between Engineering and Medicine: Collaborative Training in the Emergency Department

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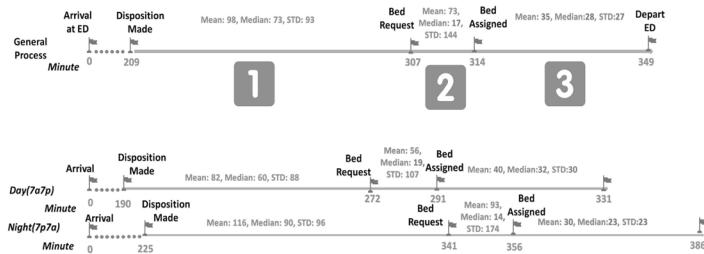
Introduction: Entrustable Professional Activities (EPAs) 9 and 13 are to “collaborate as a member of an interprofessional team” and to “identify system failures thereby contributing to a culture of safety and improvement.” Addressing EPA 9, an interprofessional initiative was begun using a project team between two university programs: medical education and health systems engineering. Addressing EPA 13, this team set out to provide diagnostic analytics for Length of Stay (LOS) delays in the Emergency Department (ED).

Methods: This project was performed in 2018 at an ED with 42 beds, an annual census of 70,000, and a 38% admission rate. Two healthcare systems engineering students and a medical student performed on-site observations to identify specific bottlenecks that could contribute to ED LOS. This data and data generated from the electronic medical record were analyzed and correlated with observations. Factors (44) that affect ED processes were analyzed, including time interval metrics such as arrival to triage, arrival to admit, disposition to departure, and bed request to admit.

Results: Patients had an average LOS of 5.9 hours. A total of 4,940 adult, non-psychiatric cases presented; 1,599 (32.4%) of these were admitted. Process evaluation (Figure, mean and median minutes) showed differences between day (7a-7p) and night (7p-7a) flow patterns. These quantitative results (EPA 13) were determined by the interprofessional collaborative work efforts of the students (qualitatively, the outcome of EPA 9).

This project demonstrated a synergistic educational experience that allowed the blending of medical education with process engineering, ultimately improving knowledge gaps of both. This unique process allowed for diagnostics to be performed that were necessary for the ED and simultaneously provided a stronger foundation for QI undertakings for both engineering and medical students.

Conclusion: Medical students can benefit from working alongside systems engineers, allowing them to see the value of using tools (simulation modeling, statistical analysis, process flow mapping, etc.) to uncover evidence-based improvements to a variety of medical processes. Healthcare systems engineering students can gain valuable experience in a complex medical environment. Looking for solutions to the disparity between flow during the day and night is an opportunity for future study.



3 Scenario-based Pilot Testing of EMS Provider Interpretation of a Novel Pediatric Triage Protocol

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Introduction: Pediatric care is increasingly concentrated in a small number of hospitals. No widely operative triage protocols guide emergency medical services’ (EMS) pediatric destination decision for nontrauma patients. The PDTree tool is an evidence-based protocol validated by expert consensus, which was developed to assist EMS providers’ in choosing a pediatric destination facility capable of definitive care. The PDTree defines four tiers of pediatric care (specialty/trauma center, comprehensive pediatric facility, regional pediatric facility and closest ED), and matches patients by condition and EMS assessment.

Objective: To pilot test the PDTree tool with practicing EMS providers for accuracy of interpretation and performance across the range of practice levels and prior experience.

Methods: Maryland EMS providers voluntarily participated in online testing. Demographic data included certification level, location of primary EMS jurisdiction, and years of experience. Providers were provided with a copy of the PDTree tool and presented 14 patient scenarios; each scenario was written to match one condition description in the PDTree tool with a clear recommendation for destination facility capability level. For each scenario, providers were asked to name their most likely destination, and to select the level of care suggested by their interpretation of the PDTree tool.

Results: 100 providers (52 ALS, 48 BLS) completed the electronic pilot test. Providers named a destination hospital with appropriate capabilities in 60% of scenarios. Providers’ interpretation of the PDTree’s advised destination level agreed with the intended response for 71% of scenarios. Greater than 90% agreement was seen for burns, witnessed child abuse, and cervical spine injury. Less than 50% agreement was seen for shock and a nondistressed child with a tracheostomy. Rates of agreement differed for diabetic ketoacidosis and nondistressed medically complex child based on provider level, and for elbow injury with deformity with years of experience (Chi Square p value = 0.01 and p value = 0.04, respectively).

Conclusion: EMS providers accurately interpreted the PDTree tool to determine the advised destination for a majority of pediatric scenarios. Future evaluation will focus on conditions with lower rates of agreement to determine if educational interventions or tool alterations are required. Virtual pilot testing using clinical vignettes is a reasonable first step in assessing the usability of a novel clinical decision-making tool.

Acknowledgement: Funding was provided by a grant from the United States Health Resources and Service Administration (HRSA-16-053: PDTree: A Tool for Prehospital Pediatric Destination Choice).

4 The Incidence of Infected Patients Identified Through a Sepsis Order Bundle

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Introduction: Sepsis order sets improve compliance with the established guidelines, but clinicians must be careful to initiate these protocols on appropriate patients. Many conditions can mimic sepsis as defined by SEP-1 (two or more SIRS* criteria and a suspected infection) such as trauma, COPD, etc. SEP-1 criteria alone can lead to initiating a sepsis protocol without true infection based solely on vital signs.