



Society for Academic Emergency Medicine

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Emergency Medicine

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Peer Reviewed Research Abstract Submissions

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#45

A Multicenter Study of the Impact of Hurricane Harvey on Emergency Department Volume

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Background: In 2017, Hurricane Harvey caused record rainfall, with more than 50 inches in some parts of Houston, Texas, and led to greater than \$100 billion in damages. During a disaster, emergency department (ED) volume slows. However, after a disaster, the need for emergency care is acute and it has been previously reported that ED visits rise post-disaster. Limited data exists comparing the local variation within a disaster zone. Texas has many freestanding EDs, and the impact of disasters on these centers is also unclear.

Methods: This abstract describes the impact of Hurricane Harvey on volume within a large hospital system through a retrospective, multi-center analysis of 11 hospital-based and 4 freestanding EDs. Data was abstracted from Cerner (Kansas City, MS) and descriptive statistics were used. The analysis compared three one-week time periods, before, during and after Hurricane Harvey (N=22253). The study examined one-week intervals beginning with the pre-storm week 8/19/17-8/25/17.

Results: The 15 emergency departments, as a system, saw a decrease of 14.26% (range: 71.43% to -18.52% in patients in the week during the storm. The same system saw a 22.28% increase in patient volume from the week of the storm to the following week, with the rise ranging from 441.67% to -28.91% depending on the ED. Relative to hospital-based EDs, freestanding EDs saw a greater decrease in volume the week of the storm, 18.43% vs 14.26%, and a greater increase in volume the week after the storm, 34.73% vs 21.81%. When comparing the week after the storm to the week prior to the storm as a baseline, there was an overall increase in volume (4.84%) in the system, as well as among hospital-based EDs (4.64%) and freestanding EDs (9.90%). The mean Emergency Severity Index (ESI) was used as a marker for ED acuity and pre-storm, intra-storm, and post-storm weeks were similar with a mean ESI of 2.9, 2.9, 3.0, respectively.

Conclusion: Compared to the pre-storm week, emergency department use decreased during Hurricane Harvey, but post-storm volume surpassed pre-storm levels. Both freestanding and hospital-based EDs saw similar changes in patient volumes. However, large differences were seen in individual EDs in this region. Future disaster planning by ED leadership could benefit from including flexibility to move staff and resources to the departments with the highest need.

#302

Burden of Disease in Emergency Department Patients in South Africa: Impacts of Human Immunodeficiency Virus

Elizabeth Hahn, George Mwinnyaa, Aditi Rao, Kathryn Clark, Nomzamo Mvandaba, Yandisa Nyanisa, Pamela Mda, Lee Wallis, Roshen Maharaj, John Black, David Stead, Steven J. Reynolds, Thomas C. Quinn, Bhakti Hansoti

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Background: South Africa has the highest burden of Human Immunodeficiency Virus (HIV) in the world. This study seeks to evaluate the impact of high HIV prevalence on the burden of disease within the Emergency Department (ED).

Methods: A prospective cross-sectional observational study was conducted from June 2017 to July 2018 in three EDs to evaluate the burden of disease in HIV-positive individuals in the Eastern Cape province of South Africa. All eligible patients (aged 18 years and older, fully conscious, and clinically stable) presenting to the ED during a six-week study period were approached and consented for Point of Care HIV test and collection of demographic information. A life-threatening emergency was defined as a South African Triage Score of emergent or very urgent. Simple descriptive statistics were used to analyse data. Log binomial models were fitted to estimate prevalence ratios.

Results: Over the total study period 8,000 patients presented to the ED for care across all sites and 3,537 patients were enrolled. An even proportion of males (1778, 50.27%) and females (1759, 49.73%) were enrolled with a median age of 35 years (IQR 26-51). Of those enrolled, 811 (22.93%) patients were identified as HIV-positive, of which 234 (6.62%) were newly diagnosed. Medical complaints were more common in HIV-positive patients (586, 72.26%) than trauma complaints (225, 27.74%). In comparison, HIV negative patients reported fewer medical complaints (1,137, 54.50%) and more trauma complaints (953, 45.60%). HIV-positive patients were more likely to have a life-threatening emergency (192, 23.67%), compared to HIV-negative patients (395, 18.90%). Overall, the top three presenting complaints were similar in both populations. In the HIV-positive population, the top three chief complaints were abdominal pain (100, 12.33%), shortness of breath (98, 12.08%), and stab wounds (63, 7.77%). Meanwhile, the top three complaints in the HIV-negative population were stab wounds (303, 14.50%), abdominal pain (203, 9.71%), and shortness of breath (163, 7.80%).

Conclusions: While overall the ED in South Africa provide care to high volumes of patients with trauma related injuries, in areas where HIV prevalence is highest, the patient are more likely to present with acute medical emergencies. ED providers in South Africa need to be well versed in the management of HIV and associated complications.

#350

Characterization of Quality Metrics of Myocardial Infarction Patients in Saipan

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Background: Heart disease and diabetes have been identified as a public health emergency on US-affiliated Pacific Islands. Heart disease is the leading cause of death in the Commonwealth of the Northern Mariana Islands (CNMI). This paper aims to describe compliance with quality metrics for acute myocardial infarctions (AMIs) in patients presenting to the Commonwealth Healthcare Center's (CHCC) emergency department (ED), the sole hospital in the CNMI.

Methods: This is a retrospective chart review of patients who were diagnosed in CHCC's ED with an AMI between September 2014 to April 2018. Paper ED logbooks and the electronic medical record system were used to collect data. Inclusion criteria were any adult who was diagnosed with AMI. There were no exclusion criteria. The quality metrics analyzed were door to electrocardiogram time (

Results: Out of 491 charts reviewed, 96 cases of NSTEMI and 70 cases of STEMI were found. Native Pacific Islanders comprised 72% of the AMI patients found in this study. The mean door to electrocardiogram (EKG) time was 25 minutes. The mean door to EKG time for STEMI cases was 19 minutes, while the mean door to EKG time for NSTEMI cases was 30 minutes. The mean EKG time for female patients was 39 minutes, while the mean EKG time for males was 15 minutes. In this study population, 44.3% of STEMI cases and 62.9% of NSTEMI cases had door to EKG times greater than the AHA recommended 10 minutes. The mean door to fibrinolysis time for STEMI patients was 55 minutes, with a range of 16 minutes to 3 hours. The percentage of STEMI cases that had a door to fibrinolytics time greater than 30 minutes was 65%.

Conclusion: Pacific Islanders have a disproportionately high representation in the patients with STEMI and NSTEMI. Compliance with quality metrics for door to EKG and door to fibrinolytics was low. Women with myocardial infarctions on Saipan have a 2.5x longer door to EKG time. Further studies should explore why there are disparities between sexes and ethnic populations.

#568

Do Standardized or Traditional Interview Questions Correlate with the Standardized Video Interview?

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Background: The American Association of Medical Colleges (AAMC) encourages residency programs to conduct standardized interviews mapped to Entrustable Professional Activities (EPAs) or specialty-specific Accreditation Council for Graduate Medical Education (ACGME) milestones. The Standardized Video Interview (SVI) was created to assess students in 2 ACGME domains; Knowledge of Professional Behaviors and Interpersonal and Communication Skills. The utility or predictive value of the SVI in interviews or resident success is unknown. Emergency Medicine (EM) programs use varied interview structures and scoring methods to conduct interviews. This study compared whether Standardized Interview questions (SI) correlate with either the SVI score or a Traditional Interview (TI) process during EM interviews.

Methods: 98 EM residency candidates were interviewed at a single university/county based EM residency program during 2018. SVI scores (range 6-30) were obtained from interview applications. Applicants were each interviewed by 2 faculty members. One faculty was randomized to use SI questions created by educational faculty mapped to 5 EM milestones; Patient Safety, Professional Values, Accountability, Patient Centered Communication and Team Management. The second faculty used unstructured traditional interview (TI) questions not mapped to either ACGME domains or milestones. Scoring systems for SI (range 5-25) and TI (range 0-70) questions were Likert scales generating total points for those interview sessions. Descriptive statistics of SI, TI and SVI scores were calculated along with correlation using a parametric (ANOVA) test.

Results: The mean and standard deviation (SD) for all three scoring systems were 54.78 (SD 6.8), 18.92 (3.305) and 19.66 (SD 2.3) for TI, SI and SVI respectively. Using ANOVA analysis, SI scores correlated to the TI scores ($p=.001$) while SVI scores compared to TI scores, did not correlate ($p=.114$).

Conclusions: EM milestone based, EPA mapped, standardized questions graded by EM faculty are more likely to correlate with traditional interview scoring than with the SVI. Despite the purpose of the SVI, its scores do not correlate with either traditional interview or a Standardized Interview formats.

#917

High-Sensitivity Troponin T in Sepsis from Pneumonia: Associated Factors and Relation to Outcome

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Background: Studies largely performed in Europe suggest that elevated cardiac troponin levels in patients hospitalized with criteria met for sepsis are associated with increased morbidity and mortality. These studies were predominantly done in intensive care units or as a subgroup of other research studies. This study aims to determine if there is an association between elevated high-sensitivity troponin T (hs-tT) levels and increased mortality and morbidity in a large urban hospital patient population with pneumonia who met criteria for sepsis.

Methods: This is a retrospective study of patients admitted to an urban ED from 12/13/2017 to 07/10/2018 with a diagnosis of pneumonia who had a hs-tT (Roche Gen 5 troponin T) ordered in the ED. Multivariate analysis was done to determine patient factors associated with a peak hs-tT >99th percentile (≥ 19 ng/mL). Univariate analysis was done to determine association with a peak hs-tT >99th percentile or myocardial infarction threshold (≥ 52 ng/mL) and ED recidivism or death within 30 days.

Results: A total of 178 patients (52.8% male) with a median age of 57 had a hs-tT level during this time period. There were 63 patients with hs-tT levels above the 99th percentile (21 were above the myocardial infarction threshold), 49 patients who returned to the ED within 30 days and 3 deaths. After adjusting for factors associated with an elevated hs-tT (age, serum creatinine, congestive heart failure (CHF) and cardiac risk factors) only age, history of CHF and serum creatinine were independently associated with an elevated hs-tT. A value of hs-tT >99th percentile or above the myocardial infarction threshold was not associated with ED recidivism (RR 1.05, 95% CI 0.7-1.7) or death (RR 1.34, 95% CI 0.7-2.5).

Conclusion: In an urban ED, an elevated hs-tT was not associated with 30-day ED recidivism or death in patients admitted with sepsis secondary to pneumonia who had hs-tT ordered as part of clinical care. Factors associated with an elevated hs-tT include age, history of CHF and history of end-stage renal disease.

#1181

Machine Learning for Improving Risk Stratification at Triage

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Background: Despite its widespread adoption, there remains high variability in nursing-assigned emergency severity index (ESI) scores during triage in emergency departments (ED), increasing interest in utilizing more objective methods. Recent literature shows that utilization of machine learning (ML) techniques offer better discrimination, but these have still maintained the same five-level triage classification system¹. It is our hypothesis that a risk score developed using ML will better discriminate patients' final emergency department disposition than a human-assigned classification system.

Methods: A retrospective study was performed evaluating patients that presented to the ED over the last two years in an academic hospital from August 2016-August 2018. The defined outcome was the final ED disposition classified as a three-level ordinal variable: Discharge, Ward Admission, ICU Admission. Data collected was randomly split into a training and validation data set. An ordinal regression model was constructed utilizing random forest methodology incorporating data collected at triage and patients' medical history. A risk score was developed from the predicted class probabilities of this model and was compared to ESI score using statistical measures of ordinal association.

Results: 88,422 patients were used to develop and validate the model after 3,459 patients were excluded due to missing ESI or disposition. When predicting on the validation dataset, the risk score had a Somers' D of 0.64 (95% CI: 0.63-0.65) and concordance probability (C-Index) of 0.82 (95% CI: 0.82-0.83) whereas ESI had a Somers' D of 0.49 (95% CI: 0.48-0.50) and C-Index of 0.75 (95% CI: 0.74-0.75). For all observation pairs, the risk score compared to ESI was more concordant with the outcome 56% of the time.

Conclusion: It is our conclusion that use of machine learning methods provides an increase in discrimination for ED disposition compared to ESI. It is our opinion that implementation of this score within an EHR will not only aid in better patient differentiation at triage but may add significant operational value.

1. Levin S, Toerper M, Hamrock E, et al. Machine-Learning-Based Electronic Triage More Accurately Differentiates Patients With Respect to Clinical Outcomes Compared With the Emergency Severity Index. *Annals of Emergency Medicine* 2018;71(5):565-574.e2.

#1888

The Varied Cost of Syncope in The Emergency Setting

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Background: Patients presenting to the emergency department with syncope may have extensive evaluations resulting in high billing costs. A direct relationship between low variation in cost and low risk of an adverse event after presenting with syncope may indicate an efficient and cost-conscious environment. This project compares the cost variability of patients presenting with syncope to the San Francisco Syncope Rule (SFSR) and Canada Syncope Risk Score (CSRS) risk stratification scales.

Methods: A retrospective chart review for patients diagnosed with syncope at a large urban emergency department between 1/01/2016 and 12/30/2016 identified 282 patients over age 18 and without traumatic syncope. A cohorted retrospective study of the discharge information for these patients examined demographics, billing data and cost calculation. Two-tailed student's t-tests were used to determine if any patient populations' total cost significantly differed from the mean patient total cost.

Results: Average total cost per patient was \$1,239.15 with a standard deviation \$1,137.26 and median cost of \$843.50. Patients with an abnormal Electrocardiography (ECG) had a significantly higher average total cost (\$1,993.74) than patients with a normal ECG (\$1,135.70) ($p < 0.05$). Patients that answered "yes" to one of the SFSR variables had significantly higher average total costs (\$1,663.12) than those who did not (\$1,107.03) ($p < 0.05$). Patients with a history of vasovagal syncope had significantly lower average total costs (\$879.22) than those without (\$1,251.01) ($p < 0.05$).

Conclusion: Comparisons of variables within the SFSR and CSRS scales indicated their respective patient populations had significantly different average costs or variability of costs. Differences may be caused by the heightened costs of advanced diagnostic testing, more thorough workups, and physician practice style that these patients required. Patients with a history of vasovagal syncope experienced a lower average cost than those without, which may be due to a decreased index of suspicion for an adverse patient event.

#2001

Fatal Crashes in the 5 Years after Recreational Marijuana Legalization in Colorado and Washington

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Background: In 2012, Colorado and Washington became the first two U.S. states to legalize recreational marijuana. The first commercial dispensaries opened in 2014. Eight additional states and Washington, D.C. have also legalized recreational marijuana. These laws raise several public health concerns including potential for higher rates of intoxication-related motor vehicle crashes and fatalities. To date, an association between marijuana legalization and motor vehicle crashes has not been established.

Methods: Using Fatality Analysis Reporting System data, we performed difference-in-differences (DD) analyses comparing changes in fatal crash rates in Washington, Colorado and nine control states with stable anti-marijuana laws or medical marijuana laws over the five years before and after recreational marijuana legalization. In separate analyses, we evaluated fatal crash rates before and after commercial marijuana dispensaries began operating in 2014.

Results: Pre-legalization fatal crash rates were 8.5 per billion vehicle miles traveled (BVMT) in Colorado and Washington and 11.8/BVMT in the control states. After legalization, the fatal crash rate increased to 8.9/BVMT in Colorado and Washington and decreased to 11.1/BVMT in the control states. The difference-in-differences was statistically significant ($p=0.04$). The post-dispensary fatal crash rate was 9.3/BVMT in Colorado and Washington and remained stable at 11.1/BVMT in the control states. This difference-in-differences was also significant ($p=0.006$).

Conclusion: Fatal crash rates increased significantly in Colorado and Washington in the five years following recreational marijuana legalization when compared with concurrent changes in nine control states. The effect was most pronounced after the opening of commercial marijuana dispensaries.

#2004

A Simulation and Small-Group Pediatric Emergency Medicine Course for Generalist Healthcare

Providers: Module 1

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Introduction: Early recognition and stabilization improves pediatric outcomes. In many lower-resource settings generalists provide the bulk of emergency medical care compared to many Western systems which rely on specialists and even subspecialists. The purpose of this curriculum is to present a curriculum focused on identification and stabilization of common pediatric emergencies for general practitioners (physicians and nurses) practicing in the acute care setting. We hope this provides a care framework for the management pediatric emergencies for providers who may not explicitly have one. This is the first module of six in the complete curriculum. The focus of this module is on pediatric respiratory emergencies.

Methods: This curriculum utilizes multimodal learning strategies including didactic teaching, rapid cycle deliberate practice (RCDP) medical simulation, small group learning, and multiple-choice testing. This module introduces common respiratory complaints including asthma, bronchiolitis, pneumonia, and acute airway management. This module is designed to be completed in 8-10 hours.

Results: We taught 26 providers with this module. Eight (8) providers were available for re-testing to evaluate for concept retention. Mean pretest to posttest written test scores improved from 8.3 to 9.7 (SD 1.3, mean difference $P = 0.027$). Fifteen participants (71.4%) found the course “extremely useful” and 28 participants (28.5%) described the course as “very useful.”

Discussion: This curriculum is an effective and well-received training tool for Belizean generalist providers. Future investigations include evaluation of other modules in this curriculum, application of the curriculum in other locations, and measuring clinical patient outcomes based on application of concepts taught.

#2005

Impact of mobile application availability on user activity for a Free Open Access Medical Education (FOAMed) resource

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Background: ddxof.com was launched in 2012 as a free resource containing clinical decision algorithms for processes common in emergency medicine. User growth has followed a stable trajectory since data collection began. We hypothesized that the release of a free, companion mobile application would result in an accelerated user growth rate.

Methods: Anonymous website access data was collected using Google Analytics beginning in January, 2014 and ending in December, 2018. Anonymous mobile application access data was collected using Google Firebase Analytics beginning in January, 2019 and ending in July, 2019. Website user activity was defined as page-views while mobile application user activity was defined as screen-views. Monthly user activity as defined and for the evaluation periods was exported from each interface in Microsoft Excel format for analysis. An annual growth rate was calculated by comparing the sum of annual events to the prior year.

Results:

Year Events Growth Rate

2014-2015 11,165 0.00

2015-2016 22,479 2.01

2016-2017 35,129 1.56

2017-2018 83,267 2.37

2018-2019 (with mobile app) 408,315 4.90

Beginning in 2014, ddxof.com saw an average annual growth rate of 1.98. After six months of data analytics including events from the companion mobile application the growth rate increased dramatically to 4.90.

Conclusion: For ddxof.com, data analytics gathered from the website and mobile application suggest that the release of a companion mobile application significantly increased user activity beyond the anticipated annual growth rate. This finding may be applicable to other FOAMed resources whose users may share similar behaviors and consumption preferences.

#2007

Evaluating a Novel Simulation Course for Prehospital Provider Resuscitation Training in Botswana

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Background: In 2012, Botswana embarked on an organized public approach to prehospital medicine. A goal of the Ministry of Health (MOH) was to improve provider education regarding patient stabilization and resuscitation. Simulation-based instruction is an effective educational strategy particularly for high-risk, low-frequency events. In collaboration with partners in the U.S., we created a short simulation-based course to teach and update prehospital providers on common field responses in this resource-limited setting. The objective of this study was to evaluate an educational program for Botswanan prehospital providers via written and simulation-based examinations.

Methods: We developed a 2-day course based on a formal needs assessment and MOH leadership input. The simulation scenarios represented common calls to the prehospital system in Botswana. U.S. practitioners facilitated didactic lectures and skills training. They also served as instructors for a rapid cycle deliberate practice simulation education model and simulation-based testing scenarios. Three courses, held in 3 cities in Botswana, were offered to off-duty MOH prehospital providers, and the participants were evaluated using written multiple-choice tests, recorded traditional simulation scenarios, and self-efficacy surveys.

Results: Collectively, 31 prehospital providers participated in the 3 courses. The mean scores on the written pretest were 67% (standard deviation [SD], 10) and 85% (SD, 7) on the post-test ($p < 0.001$). The mean scores for the simulation were 42% (SD, 14.2) on the pretest and 75% (SD, 11.3) on the post-test ($p < 0.001$). The intraclass correlation coefficient scores between reviewers were highly correlated at 0.64 for single measures and 0.78 for average measures ($p < 0.001$ for both). Twenty-one participants (68%) considered the course “extremely useful.”

Conclusion: Botswanan prehospital providers who participated in this course significantly improved in both written and simulation-based performance testing. General feedback from the participants indicated that the simulation scenarios were the most useful and enjoyable aspects of the course. These results suggest that this curriculum can be a useful educational tool for teaching and reinforcing prehospital care concepts in Botswana and may be adapted for use in other resource-limited settings.

#2008

Hepatitis C Screening of In-Custody Patients in an Urban Emergency Department

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Introduction: Hepatitis C virus (HCV) is prevalent among incarcerated patients. Louisiana has one of the highest rates of incarceration, as well as a high prevalence of Hepatitis C. Many patients in custody interface with the emergency department (ED). Our urban, academic ED has a grant to implement ED screening program for HCV. An average of 200 in custody patients visit our ED, each month, creating a unique opportunity to collect valuable data on the disease burden of Hepatitis C in our state's in custody population.

Methods: A retrospective chart review of patients in custody who visited our ED between 3/1/2015 and 9/31/2017 is being conducted. We define "in custody" as any patient who is brought by law enforcement, including prisoners, in jail, or under arrest. While our ED has a universal screening program, a provider must order a Hepatitis C test for the screen to occur. All charts of in custody patients screened for hepatitis C were reviewed. Positive screens were further reviewed to determine rates of specialty clinic follow-up and treatment. Discharge paperwork of positive screens were reviewed to determine rates of diagnosis and follow-up disclosure.

Results: 642 Hepatitis C screening tests were ordered on in custody patients during the study period. 214 (33.3%) were positive. Excluding patients who died during their screening visit or were discharged to hospice, 201 patients were eligible for a follow-up visit. 58 patients (28.9%) followed up with an HCV specialty clinic within the Departments of Hematology/Oncology, Gastroenterology/ Hepatology, or Infectious Disease. 12 patients (6.0%) received treatment for HCV. 89 patients (44.3%) had their diagnosis disclosed in their discharge paperwork, and 57 patients (28.4%) were instructed to arrange follow-up.

Conclusions: The percentage of patients who screened positive for HCV was very high. Patients diagnosed while in custody received limited follow up at specialty clinics. A small minority of patients received treatment for Hepatitis C. A potential area of improvement lies with screening providers, who often fail to disclose positive tests in patients' discharge paperwork. Further analysis of rates of screening, factors contributing to disease prevalence, and potential avenues to treatment are still being performed. Overall, this study highlights Hepatitis C as a public health hazard in Louisiana's in custody population, and one that should be addressed equitably and rigorously.

#2009

The Impact of Insurance Requirements on The Influx of Patients in an Emergency Department

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Background: In March of 2010, Congress passed the Health Care Reform Act. From 1995 to 2014, the number of individuals that visit the Emergency Department (ED) has significantly increased from 95,000 to 136 million. This study examined whether the influx of patients coming to the ED is associated with lack of resources in the community and lack of access to a Primary care provider (PCP).

Methods: A brief survey was conducted in the ED of an urban, academic safety net hospital in July of 2016 to determine if there were trends in chief complaints, insurance status, accessibility to a PCP, or perceived barriers to healthcare. A random sample of 150 patients between the ages of 18-65 was asked to participate. Individuals with altered mental status, unstable vital signs, prisoners, those not able to consent, or those who refused were excluded from the study.

Results: Thirty-eight percent of respondents experienced transportation being their most significant barrier. A lack of primary care availability was reported by 38%, with 54% of those patients endorsing that this resulted in an ED visit. We observed that 63% of individuals that were insured after March of 2010 came to the ED because they were unable to be seen by a PCP within a time frame that they deemed reasonable for their chief complaint. Thirty percent of individuals that were newly insured were not able to access a PCP. Fifty percent of that group claimed that this inconvenience resulted in an ED visit.

Conclusion: Although millions of Americans obtained health insurance following the enactment of the Affordable Care Act (ACA), shortages of primary care physicians and other office-based doctors left many patients with limited access to care [4]. Many Emergency Departments are packed with patients who are uninsured with no other resources for healthcare, or have healthcare and add to the burden since they are unable to see their Primary care provider in a timely manner.

#2010

Intramuscular Medication for Agitation of Psychiatric Origin: A Systematic Review of Controlled Trials

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Background: When verbal de-escalation fails, intramuscularly administered medications are commonly used to sedate agitated patients in the emergency department. A systematic review of the relative effectiveness and side effects of intramuscular sedatives is therefore of high clinical importance. Unfortunately, previous reviews have not evaluated the literature with sufficient methodological rigor to adequately inform treatment decisions.

Methods: Several databases including PubMed, International Pharmaceutical Abstracts, Web of Science, PsycINFO, and clinicaltrials.gov were searched for prospective experimental controlled trials investigating the use of intramuscularly administered medication for the treatment of acute agitation of any cause in emergency or psychiatric emergency departments. Articles were assessed for bias using the Cochrane Risk of Bias Tool.

Results: Seven studies with a total of 910 patients worldwide were eligible for inclusion in the systematic review. Most studies were rated as having either some concerns for bias or a high risk of bias.

Conclusions: Only two of the seven trials investigating intramuscularly administered medication for the emergent treatment of acute agitation were found to be at a low risk of bias. Of those two, one showed second-generation antipsychotics are as effective as first-generation antipsychotics with less risk of side effects and the other indicated a combination of a first-generation antipsychotic and a benzodiazepine was more successful than a first-generation antipsychotic alone. More research is needed before evidence-based clinical recommendations can be made.

#2012

Patient Reported Pain Severity vs. Provider Perception across Race and Ethnicity

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Background: Prior studies have shown that pain perception may be susceptible to racial/ethnic biases. By expanding our understanding of these associations, we hope to aid in the understanding of pain assessment and reduce disparities in pain management. This study assesses differences in reporting and perceiving pain within the multicultural population of Dallas, Texas.

Methods: After obtaining verbal consent, subjects were asked to indicate the intensity of their pain on the Visual Analog Scale (VAS) by marking a line anchored with terms describing the extremes of pain intensity from no pain to pain as bad as it could possibly be. The patient's nurse was asked to rate their perception of the patient's pain. The physician was asked to rate their perception of the patient's pain.

Results: The patient population was composed of 242 African Americans (46.9%), 105 non-Hispanic Whites (20.4%), 149 Hispanics (28.9%) and 20 other/unknown races and ethnicities (3.9%). The VAS scores from the patients, physicians and nurses were compared for association. The mean reported VAS scores were 7.445 in the patient population, 5.606 among the physicians and 5.174 among the nurses. The Pearson correlation coefficients resulted with a statistically significant p-value of < 0.0001 when comparing any of the three groups with one another.

African American patients reported an average VAS of 7.5, non-Hispanic Whites reported a mean VAS score of 7.252, the mean VAS score for Hispanics was 7.534, and the other/unknown population had a mean VAS score of 7.125. The mean physician VAS scores were as follows: 5.555 in African American patients, 5.42 in non-Hispanic White patients, 5.825 in Hispanic patients and 5.588 in patients with other or unknown race and ethnicities. There was no significant difference in pain perception by assessor across race. Physicians rated Hispanic patients significantly higher on the pain scale, but it was closer to the patient's self-report than for non-Hispanic patients.

Conclusion: There are significant differences in the perception of pain severity by patients, physicians and nurses. Physicians rated patient pain severity significantly lower than patients did. Further research should be completed to investigate the variables that cause discrepancies in pain perception by patients, physicians and nurses.

#2013

Chest Pain Preferences for Inpatient vs Outpatient Functional Studies for Chest Pain

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Background: Chest pain is one of the most common presentations in the Emergency Department (ED), and can often result in low-risk patients being admitted for prolonged cardiac testing and observation. The study will determine whether patients that present to the ED prefer having their chest pain studies done as an inpatient or an outpatient, and if they prefer invasive or non-invasive testing. In addition, we will assess for interest in use of a predictive chest pain decision tool.

Methods: The study was implemented using an anonymous survey in the emergency department (ED) of a tertiary care center. Patients were given a survey that assessed their preferences for further care. Preferences for admission to the hospital for inpatient functional studies or discharge from the hospital for outpatient functional studies were assessed. Additionally, survey participants were asked about their preferences for invasive versus non-invasive functional studies and their interest in patient use of a predictive chest pain decision tool. Patients who presented to the ED with chest pain were determined to be candidates for the survey if the treating clinician stated that the patient's EKG did not reveal an ST elevation myocardial infarction (STEMI) and that their cardiac biomarkers were normal.

Results: When inquiring about location preferences: 61.2% of patients prefer inpatient while 19.5% prefer outpatient, with 15.9% having no preference and 7.1% of not knowing which location they preferred. Regarding the type of chest pain study: 60.5% of patients prefer non-invasive studies compared to 9.4% preferring invasive studies, with 22.4% having no preference and 3.2% not knowing which type of study they preferred. Among the patients surveyed: 86.3% of patients have an interest in a predictive chest pain tool, but 10.4% of patients show no interest, while 22% do not know their interest level and 0.9% have no answer.

Conclusion: Based on these results, it appears the majority of patients prefer non-invasive chest pain studies done in the inpatient setting, and there is a strong interest in development of a predictive chest pain tool.

#2014

Seniors and SUDS (Single-Use Detergent Sacs): A review of the National Poison Center Database

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Background: The dangers of exposure to single-use detergent sacs (SUDS), or laundry pods, has been well documented in pediatrics. Elderly adults, especially those with dementia, have an increased risk of unintentional exposure to household products. This study aims to describe SUDS exposures in adults greater than 65-years-old.

Methods: This is a review of SUDS exposure in cases 65 years of age or older that were reported to the National Poison Data System (NPDS) from 2012 to 2017. The distribution of cases was analyzed for demographics, exposure circumstances, management, and outcome.

Results: There was an increasing trend in the number of exposures over time, with an average age of approximately 70-years-old. Females comprised the most exposures (n=485, 63.7%). Unintentional exposures occurred in 93.9% (n=714), and intentional exposures in 4.1% (n=31). Exposure routes were oral, ocular, dermal or rectal. The most common route, ingestion, comprised of 68.2% of the cohort (n=518), of which 94.6% (n=490) were unintentional ingestions. Many of the unintentional ingestions reported confusion and/or mistaking the SUDS for a pill or food. Respiratory depression or arrest occurred in 1% (n=6) of ingestions, however intubation occurred in almost 2% (n=10). Of the overall cohort, 56.5% (n=430) were managed on site, 39.7% (n=302) were treated at a health care facility (HCF), and 3.7% (n=28) were listed as unknown or other. Only 25.5% (n=194) were treated, evaluated and released. In those cases that were admitted, 36 (4.7%) were placed in non-critical care units and 1.7% (n=23) went to critical care units. A large number of cases had no or minor effects (n=606, 79.7%) or moderate effects (n=87, 11.4%). Major effects were seen in 9 cases (1.2%) and death ensued in 4 cases (0.5%). All deaths occurred after ingestion, with subsequent respiratory compromise and cardiac arrest.

Conclusions: Laundry detergent pack exposures are increasing among the elderly despite industry changes such as opaque packaging, a child resistant lid, and the addition of bittering agents. The number of cases reporting confusion or mental incompetence emphasizes the poisoning dangers that geriatric populations with dementia face.

#2015

Identification of Biomarkers of the Opioid-Induced Neuronal Degeneration in Mouse Brain and Plasma

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Background: Opioids are the most effective drugs commonly prescribed to treat pain. Despite widespread abuse of opioids, we know little about the long-term consequences of chronic use. Recently, concern regarding the effect of chronic opioid exposure on neuronal degeneration has emerged. Toxic effect of opioids has been documented not only for heroin abusers but also for patients with a history of long-term use of prescription opioids. Currently, there is no inexpensive, minimally invasive method to monitor neuronal degeneration.

Methods: To investigate the effect of chronic opioid use we treated mice with either water or morphine (15 mg/kg) for 30-60 days. We monitored biomarkers of neuronal degeneration in brain tissues using immunohistochemical and western blot analyses.

Results: We demonstrated that chronic morphine administration is associated with activation of pro-apoptotic signaling (increased level of activated caspase 3) in mouse brain. In addition, in plasma of animals chronically treated with morphine, we observed increased levels of neuronal proteins such as myelin basic protein and tau as well as accumulation of pro-inflammatory TNF α and IL-1 β .

Conclusion: The findings of this project support the hypothesis that chronic opioid use causes a negative impact on neuronal health. Our data also suggest that measuring the level of neuronal and pro-inflammatory biomarkers in blood samples may serve as a diagnostic tool to monitor drug-induced neuronal degeneration in research and clinical settings.

#2016

Improved Sepsis Mortality Rates Using qSOFA at an Inner-City Community Hospital

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The purpose of the study is to implement the quick sequential organ failure assessment (qSOFA) as a triage tool to improve patient outcomes and reduce mortality. The preliminary review study presented by a chief resident in a Chicago, Illinois inner city 254-bed community hospital showed that qSOFA is an effective assessment tool to prompt sepsis and septic shock alerts. qSOFA is considered easy to use for all triage health care personnel. The qSOFA entails three screening criteria which include: altered mental status, using a Glasgow coma scale (GCS) of less than 13, a respiratory rate greater than 23 beats per minute, and a systolic blood pressure of less than 100. Educational training provided all hospital employees to demonstrate competency in using this assessment instrument. Sepsis mortality rates were compared prior to and following the implementation of qSOFA to demonstrate its effectiveness. Using data-driven clinical criteria in an effort to prevent sepsis mortality in essential in guiding emergency medical care. This research focus looks into implementing qSOFA as a triage tool in determining early sepsis interventions to reduce mortality rates.

Introduction: Each year over 1 million cases of sepsis occur in the United States resulting in 258,000 deaths according to The Centers for Disease Control. Sepsis is life-threatening organ dysfunction subsequent to dysregulated host responses to infection. Emergency Department care is crucial to early sepsis treatment. Due to the arguability of sepsis definitions, it is even more imperative to have an effective and reliable screening tool for its detection. The aim of the study was to decrease sepsis mortality rates at this inner city 254-bed hospital through research-based educational in-service training of physicians and medical staff.

The null hypothesis: there is no difference between using qSOFA assessment and decreased sepsis mortality rates. The alternative hypothesis: There is a difference between the use of qSOFA assessment and decreased sepsis mortality rates.

Methods: Prospectively recorded data between January 2019 and August 2019 on adult patients diagnosed with sepsis at a 254-bed community hospital in inner city Chicago, Illinois was reviewed as part of an ongoing quality improvement project in sepsis management. A pre-assessment and post-assessment on qSOFA and SOFA were evaluated prior to and following the educational training in-service. Basic characteristics were obtained from SPSS (2016) summary statistics. Chi-squared and Fisher's exact test were used to assess categorical variables. Independent samples t-test and Mann-Whitney tests were used for continuous data, as appropriate. Pre and post sepsis patient charts were reviewed to analyze the sepsis outcomes and the use of qSOFA. A statistical report was generated to assess utilization of the sepsis standardized orders sets for both physicians and nurses.

Results: According to the confirmed registration and sign-in sheet participants, an estimated 87% of the required mandated employees participated in the sepsis educational training in-service. The trainings took place from April 2019 to May 2019. A total number of 98 health care physicians and employees who took a pre-assessment and post-assessment covering sepsis educational in-service easily identified sepsis patient cases. A 26.2% reduction rate in mortality was observed after the sepsis training. The minimum passing score of 80% on the sepsis educational training and use of qSOFA was obtained and resulted in a mean score was of 84% (standard deviation = 8) with 60% of the participants being nurses.

Conclusion: We failed to reject the null hypothesis, therefore, there was significant difference in decreased mortality rate due to sepsis. This research study documented a high prevalence of deaths due to sepsis prior to the implementation of quick sequential organ failure assessment (qSOFA). After conducting a series of educational in-service trainings of physicians and medical staff, results demonstrated a measurable decrease in sepsis mortality rates due to educational in-service training on qSOFA.