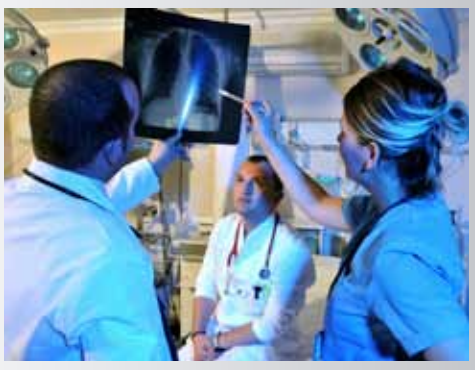
ILLINOIS COLLEGE OF EMERGENCY PHYSICIANS

2013 ICEP Spring SYMPOSIUM & ANNUAL BUSINESS MEETING



ON THE AGENDA: Challenging Myths in Medicine ■ Delivery Systems and Payment Changes ■ EM Without an IV

THURSDAY, MAY 2, 2013

Northwestern Memorial Hospital ■ Chicago, Illinois

Statewide Research Showcase

RESEARCH ABSTRACTS

PRESENTED BY ILLINOIS COLLEGE OF EMERGENCY PHYSICIANS IN CONJUNCTION WITH PRESENCE RESURRECTION MEDICAL CENTER

2013 ABSTRACTS
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* Abstract was selected for presentation at the 2013 Spring Symposium

Ketamine for Continuous Sedation of Mechanically Ventilated Patients: A Retrospective Safety Analysis

Nicolas Kettaneh, MD, David Barounis, MD, Karis Tekwani, MD;
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Context: Long-term sedation with midazolam or propofol has been demonstrated to have serious adverse side effects, such as toxic accumulation or propofol infusion syndrome. Newer medications such as dexmedetomidine have been suggested as alternatives; however, the cost may limit its accessibility. Ketamine remains a viable alternative for continuous sedation as it is inexpensive and widely available, however, there are few analyses regarding its safety in this clinical setting.

Objective: To review the data related to safety and efficacy of ketamine as a potential sedative agent in mechanically ventilated patients admitted to the intensive care unit (ICU).

Methods: This was a single center retrospective study from September 2011 to March 2012 of patients who required sedation for greater than 24 hours, in whom ketamine was selected as the primary sedative agent. Consecutive patients admitted from the emergency department to the ICU receiving continuous sedation with ketamine were enrolled. All patients greater than 18 years of age, regardless of admitting diagnosis, were eligible for inclusion. Patients that received ketamine for continuous infusion but died prior to receiving it for 24 hours were not included.

Results: 30 patients received ketamine for continuous sedation. The mean duration of sedation with ketamine was 59.6 hours. In 4 patients ketamine was switched to another sedative agent due to possible adverse side effects. Of these, 2 patients had tachydysrhythmias, both with new onset atrial fibrillation and 2 patients had agitation believed to be caused by ketamine. The adverse event rate in our patient population was 13% (4/30). No patient required switching to another sedative agent due to hemodynamic compromise. The average sedation score using the Motor Activity Assessment Score (MAAS) recorded from nursing notes was 1.9. 15 patients had fentanyl drips concurrently running with the ketamine infusion.

Conclusions: Among ICU patients receiving prolonged mechanical ventilation, the use of ketamine appeared to have a frequency of adverse events similar to more common sedative agents, like propofol and benzodiazepines. Ketamine appears to have a favorable safety profile without significant effects on hemodynamics and delirium and it may be a reasonable alternative for patients requiring mechanical ventilation.

Does a Novel Simulator Provide Effective Hands On Training Versus Traditional Trauma Ultrasound Training for a Disaster Response Team? A Prospective Randomized Study

Basem Khishfe, MD, Michelle Sergel, MD, Karen Cosby, MD, Russ Horowitz, MD, Danielle McGee, MD, Mike Paddock, DO, John Bailitz, MD; John H. Stroger Jr Hospital of Cook County, Chicago, IL

Background: Traditional Training (TT) in Trauma Ultrasound (TUS) requires costly workshops with multiple instructors, models, and ultrasound systems. The laptop based SonoSimulator (SS), provides a portable, didactic, and novel hands on TUS training solution for medical disaster responders.

Objective: The purpose of this study is to examine the effectiveness of hands training utilizing the SS in comparison to TT during a TUS workshop for a Disaster Response Team (DRT).

Methods: Prospective randomized trial comparing hands on TT to SS training. During the 2012 Chicago NATO summit, a TUS workshop was provided for a visiting DRT. All 36 DRT members consented to participation. Subjects first completed a validated written test followed by SS video didactics. Subjects were stratified by provider role and randomized into three groups for hands on training. Group 1 completed TT and SS, Group 2 completed only SS, Group 3 completed only TT. Next, each group completed a practical assessment of TUS image acquisition on live models and interpretation of actual case images. Then, subjects completed the same written test. The main study outcome was performance on the practical assessments. T-test analyses were used to compare pre and post test scores. ANOVA analyses were performed to examine group effect on differences in practical assessments and pre and post test scores.

Results: Among subjects, 25% were Nurses, 8% Nurse Practitioners, 3% Residents, 28% Physicians, 3% EMTAs, 30% EMTBs, and 3% Pharmacists. Provider roles were equally distributed among groups. The mean pre-test score was 17% (0-70%) and the mean post-test score was 54% (36-84%)($p < .001$). Although a statistically significant increase was observed from pre to post test scores for all subjects, there was no significant group effect. The mean practical image acquisition score was 3.3 (Scale: 1 Totally inadequate, 3 Just Adequate, 5 Text Book Images Obtained). The mean correct image interpretation score was 78%. There was no statistically significant group effect on practical assessment scores.

Conclusions: After hands on training with either TT or the SS, DRT members were able to adequately acquire and interpret TUS images. Based on these initial results from our small sample, the SS may provide an effective, logistically simple, portable training option warranting further larger scale study.

A Prospective Observational Study Of Inter-Observer Agreement For Pretest Probability Assessment Of Deep Venous Thrombosis

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Abstract:

Background: The ED is a common destination for patients with acute lower extremity symptoms concerning for deep venous thrombosis (DVT). Evaluation is challenging, due to inadequacy of clinical exam to identify clot, lack of 24 hour duplex Doppler ultrasonography, and lack of familiarity with the most common pretest probability assessment tool for DVT, the Wells score. Optimal identification of low probability patients could expand use of D-dimer testing yielding improved efficiency.

Objectives: We report use and precision of pretest probability for components of the Wells DVT score as well as empiric clinician judgment.

Methods: Prospective, observational single center ED study including all patients evaluated for DVT.

Exclusions: Known DVT patients on warfarin with INR >2.0 or other non-aspirin anticoagulation, DVT diagnosed within last 1 month regardless of INR, or known results of duplex Doppler. Two clinicians (attending, resident or mid-level) independently evaluated each patient prior to test results and completed a web-based data collection instrument including components of the Wells Score and overall clinician empiric estimation of DVT probability (<10%, 10-19%, ≥20%). Structured medical record review determined outcome. The kappa statistic was calculated to assess inter-observer agreement.

Results: 90 patients were enrolled; mean age was 53 years, 67% female. Acute DVT diagnosed in 13% (95% CI 7-22%) acute PE in 3% (0.7-9%). Kappa values that were good (>0.60) were: active cancer (0.88), leg immobility (0.70), previous DVT (0.93). Kappa values that were poor (<0.20) included: pitting edema, and superficial collateral veins. All other Kappa values were fair to moderate. Kappa for binary empiric unstructured gestalt (<10% vs. ≥10%) was 0.35 with 67% agreement. Prevalence of acute DVT/PE in the empiric<10% group was 3/39 (7.7%). Acute DVT/PE in the Wells ≤2 group was 9/71 (12.5%) (95% CI for difference: -6-16%).

Conclusion: This preliminary work suggests highest precision exists for the historical components of the Wells DVT score rather than the physical exam components. Additional work with increased sample size is needed to compare accuracy of the Wells DVT score in aggregate vs. empiric gestalt estimation. However, the clinical utility of both may be limited by low inter-observer agreement.

Dynamin Related Protein 1 (DRP1)-Induced Diastolic Dysfunction in Myocardial Ischemia-Reperfusion Injury*: Therapeutic Benefits of DRP1 Inhibition*

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Introduction: Mitochondria morphology is an important determinant of function and is in part regulated by the processes of fission and fusion. Dynamin Related Protein-1 (DRP1) is a newly recognized GTPase that regulates fission. DRP1 has been implicated in regulating myocardial infarct size following ischemia/reperfusion (IR) injury. The mechanism by which DRP1 contributes to IR injury is not known and its contribution to acute left ventricular (LV) impairment following IR has not been studied.

Hypothesis: DRP1 activation following IR results in rapid alterations in mitochondrial function and morphology resulting in left ventricular dysfunction. Inhibition of DRP1 will preserve mitochondrial function, morphology, and ventricular function.

Methods and Results: In both isolated neonatal murine cardiomyocytes and adult rat hearts (Langendorff preparation) mitochondrial fragmentation and swelling occurred within 30 minutes of IR. DRP1 dephosphorylation (Serine-637) resulted in DRP1 mitochondrial translocation and mitochondrial fission. The DRP1 inhibitor, Mdivi-1, given prior to IR, preserved mitochondrial morphology, reduced cytosolic calcium, and prevented cell death. DRP1 siRNA similarly preserved mitochondrial morphology. In Langendorff hearts, IR increased mitochondrial ROS, reduced developed pressure and severely elevated LV end diastolic pressure (LVEDP). Mdivi-1 decreased ROS, improved developed pressure (92±5 vs. 28±10 mmHg, $p<0.001$) and lowered LVEDP (10±1 vs. 86±13 mmHg, $p<0.001$). Because Serine 637 dephosphorylation is calcineurin-sensitive, we assessed the effects of a calcineurin inhibitor (FK506). FK506 treatment prior to IR prevented DRP1 Serine 637 dephosphorylation and preserved cardiac function. Likewise therapeutic hypothermia (30°C) inhibited DRP1 Serine 637 dephosphorylation and preserved mitochondrial morphology and myocardial function. To demonstrate the protective effects of DRP1 inhibition in vivo, we administered Mdivi-1 to mice immediately following an 8-minute cardiac arrest during the initiation of cardiopulmonary resuscitation. Mdivi-1 increased post resuscitation survival of mice at 2 hours (9/10) mice compared to controls (1/11).

Conclusions: DRP1 inhibition is a novel strategy to preserve mitochondrial morphology and function following IR resulting in improved myocardial function. Our findings hold implications for strategies to improve outcomes from cardiac arrest, acute coronary syndromes and cardiac bypass surgery.

Mononucleosis Testing in the Emergency Department: Correlation with Signs and Symptoms

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Abstract

Introduction: Infectious mononucleosis (IM) is a disease with potential serious complications, such as splenic rupture and hepatic necrosis, if the diagnosis is unsuspected. A positive Monospot™ test has been shown to have highly variable sensitivity Therefore, a negative test does not provide the physician with much clinically relevant information. Given the relative low incidence of IM, there are a large number of negative IM tests encountered. If risk stratification could be performed to decrease the number of unnecessary tests, then patients would be saved time, pain, and expense.

Study Objectives: This study will determine the incidence of a positive Monospot™ in a community Emergency Department setting and correlate associated clinical signs and symptoms.

Methods: This is a four year retrospective, chart review study from the Emergency Department (ED) of a urban/suburban community teaching hospital. Included are all patients who had a Monospot™ test performed in the ED. Data collected included test results, age, gender, prior medical visit, antibiotic use, and duration of symptoms. Symptoms included subjective fever, sore throat, malaise, headache, nausea, and emesis. Signs included temperature, pharyngeal erythema, tonsillar exudate, anterior cervical adenopathy, posterior cervical adenopathy, splenomegaly, and rash.

Data extraction and collection was performed by two study authors with 10% random audit by the senior author resulting in a Kappa statistic of .851 to 1.00 Descriptive statistics, Chi-squared, Student-t testing and logistic regression all analyzed with significance was set at .05 and two-tailed P-values.

Results: 388 ED patients between 2005 and 2008 had Monospot™, with mean age of 23.6 years (SD: 12.2) and 52.8% females and 10.3% (40/388) positive results. None of the presenting symptoms were significantly correlated with a positive test. However on both univariate testing and logistic regression, posterior adenopathy (OR: 9.23, P<.001), splenomegaly (OR: 5.84, P=.001), and tonsilar exudate (OR: 2.35, P=.030) were significantly associated with a positive test. In this study five out five (100%) patients with the combination of posterior lymphadenopathy and splenomegaly had a positive Monospot™ in the ED while in the absence of all three physical signs, only 3.6% (7/192)

had a positive test.

Conclusion: This general population study from a community hospital Emergency Department (ED) found 10.3% positive Monospot™ test. Three clinical signs, tonsillar exudate, posterior lymphadenopathy, and splenomegaly were found to be significantly correlated with a positive test. In this study 100% of patients with both posterior lymphadenopathy and splenomegaly were positive while in the absence of the three clinical signs, only 3.6% had a positive test. Emergency Physician will find these results useful when considering a mononucleosis test from the ED.

Key Words: Mononucleosis, Testing, Signs and Symptoms, Correlation

Can You Identify High Risk Pulmonary Embolism Patients Based on EKG and Echocardiogram Results?

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Abstract

Introduction: Pulmonary embolism (PE) is a common disease entity occurring in approximately 1 in 1000 people each year. Diagnosing patients with PE can be difficult as patients with PE often present with nonspecific signs and symptoms. As a cause of death, massive/saddle PE is second only to sudden cardiac death. Diagnostic study results such as EKG, echocardiography, and venous ultrasound results have not been shown to be consistent in patients with PE.

Study Objectives: To determine if there were common EKG, echocardiography, or venous duplex ultrasound findings suggestive of massive pulmonary emboli.

Methods: This is a 5-year retrospective medical record review from a community teaching hospital with its own Emergency Medicine residency program. Following IRB approval, all ED patients age $\geq$18 admitted to the hospital with a new PE were reviewed. Excluded were cardiac arrest patients and those without CT confirmation of PE. Data collection included demographics, location and type of PE, ECG findings, echocardiogram results, and venous duplex ultrasound results. Comparisons between groups were made using Chi-squared ANOVA as appropriate. Significance was set at 0.05.

Results: There were 674 cases of PE reviewed over the five-year study period. 73 were not diagnosed by CT scan and thus excluded, leaving a study group of 601. The mean age was 68.6 years (SD:16.0) with 42.3% males. By location, 32.8% were unilateral sub-segmental, 37.8% bilateral sub-segmental, 15.3% unilateral mainstem, 9.1% bilateral mainstem, and 5.0% saddle. On EKG, the presence of S1Q3T3 increased from 4.1% for unilateral sub-segmental to 33.3% for saddle emboli (P<0.001). RBBB increased from 5.1% to 13.3% (P=0.006). 320 cases (53.2%) had an echocardiogram performed. RVH, diagnosed by echocardiogram, increased from 7.5% of unilateral sub-segmental to 41.7% for saddle emboli (P=0.001). DVT studies were performed on 510 (84.9%) patients.
Positive DVT studies increased from 30.7% in unilateral sub-segmental to 76.9% in saddle emboli (P<0.001).

Conclusion: Patients in our study group who were diagnosed with saddle pulmonary emboli were significantly associated with more S1Q3T3 and RBBB abnormalities on EKG, RVH on echocardiogram, and more likely to have the presence of a DVT detected

on ultrasound. This suggests that we may be able to identify those high-risk PE patients more rapidly based on their EKG and echocardiogram results.

Key Words: Saddle pulmonar y embolism, echocardiogram, RVH, EKG abnormalities

Value of Prior Urine Culture in the ED Elderly

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Abstract

Introduction: ED (emergency department) patients from nursing homes frequently have recurrent sepsis from a urinary source. Culture and sensitivity data from previous visits are often available to the EP (emergency physician). Reviewing previous urine culture results may be of aid in the choice of initial empiric antibiotics.

Study Objectives: The objective of our study will be to examine the percentage of inappropriate empiric antibiotic administration by emergency department physicians in patients with a prior urine culture and sensitivity at the same institution and determine if knowledge of the prior results would alter the physician's initial antibiotic selection.

Methods: This is a retrospective chart review of geriatric patients age ≥65 years presenting to the Emergency Department (ED) of a community hospital and admitted to the hospital with a diagnosis of UTI and sepsis. Data abstracted includes demographics, presence of foley catheter, documented history of prior hospital visit on chart, allergies, initial ED antibiotic(s) given, results of ED urine culture and sensitivity (C&S), results of any urine C&S done at the hospital within the prior 6 months of ED visits. Clinical assessment was made of initial antibiotic selection based on subsequent C&S. Clinical assessment was also made of the likelihood of the Emergency Physician (EP) altering initial antibiotic selection if the prior urine C&S were known. All clinical assessment were repeated by the senior investigator with Kappa of 0.806 and 0.850 Differences between groups were tested using Chi-square with significance set at 0.05

Results: Over a six month period, 231 records of patient ≥ 65 years old admitted from the ED with UTI and sepsis were reviewed. 110 (46.8%) had a urine culture done in the same institution within the six months prior to ED presentation. Two patients had missing medical records giving a sample size of 108. The mean age was 83.5 years (SD: 7.04) with 76.9% (83/108) females. 56.5% (61/108) were from nursing homes, 24.1% (26/108) had foley catheters, and 25.9% (28/108) had an antibiotic allergy. Only 32.4% (35/108) had history of prior hospital visit recorded on their ED chart. 73.1% (79/108) had a positive urine C&S on ED visit and based on C&S, the initial ED antibiotic was appropriate in 74.7% (59/79) overall, appropriate in 75.0% (21/28) of patients with prior visit recorded and 74.5% (38/51) patients without prior visit recorded (P=.962). 58.3% (63/108) had both ED C&S positive and a prior C&S positive. Thus out of 231 patients, 63 (27.3%) were found to have a prior C&S which could have potentially altered the initial antibiotic selection by the EP. Of these 63 patients 47.6% had the same bacteria and sensitivity as before. However, 74.6% (47/63) of these patients had appropriate initial antibiotic based on ED C&S results and of the 16(25.4%)

not given initial appropriate antibiotics, only six (9.5%) would have an indicated change in initial antibiotics based on prior C&S results. All six cases involved prior urine cultures of Enterococcus with four being Vancomycin resistant.

Conclusion: In this retrospective review of elder UTI and sepsis from a single institution, 27.3% were found to have positive C&S both in the ED and on prior cultures and of those 74.6% had appropriate initial antibiotics started in the ED. 25.4% were not started on appropriate antibiotics but in only 9.5% would knowledge of the prior urine culture results change the emergency physician's initial antibiotic selection.

Key Words: ED, urine culture, Prior urine culture, antibiotic selection

Induction of Hypothermia with an Esophageal Cooling Device in a Swine Pediatric Model

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Introduction: Mild therapeutic hypothermia has been shown to improve neurological outcome and decrease mortality in cardiac arrest, hypoxic ischemic encephalopathy, and other conditions in adults and neonates. Mild therapeutic hypothermia in pediatric patients also appears beneficial. To evaluate a new method of inducing hypothermia, we measured the ability of an esophageal device (designed to replace the standard orogastric tube) to induce hypothermia in a pediatric animal model. We hypothesized that an esophageal cooling device can effectively induce mild therapeutic hypothermia (defined as 4 C below baseline temperature) in a pediatric swine model at a minimum rate of 1 C per hour.

Methods: Three female Yorkshire swine (22.7 kg ± 1.8 kg) were anesthetized with inhalational isoflurane via endotracheal intubation. Swine #1 was not covered with any blankets, while Swine #2 and Swine #3 were covered with blankets to prevent passive cooling due to cold operating room conditions. The device was inserted orally into the esophagus, with placement confirmed via auscultation and suction of gastric contents through a central suction channel. The water channels of the device were connected to an external chiller (Gaymar MediTherm III), and swine temperature, measured rectally, was reduced to goal temperature by setting the chiller to automatic cooling mode.

Results: Average baseline temperature for the 3 animals was 38.3 C (range 37.8 C to 38.8 C). Swine #1 experienced a maximum temperature decrease of 3.5 C/h and reached goal temperature in 83 min; however, passive cooling contributed up to 1.8 C/h of this rate. Swine #2 and Swine #3 were maintained at a steady-state baseline temperature with the addition of blankets prior to initiating cooling, after which they experienced maximum temperature decreases of 1.5 C/h and 1.7 C/h, and reached goal temperature in 180 min and 182 min respectively. No treatment for shivering was necessary in any subject during the protocol.

Conclusions: An esophageal device successfully induced therapeutic hypothermia in a pediatric swine model, suggesting this approach may be an effective means of inducing hypothermia. Maximum cooling rates exceeded expectations and goal temperature was attained faster than expected for all swine, even with skin surface covering.

How Well Can Adolescents Assess Their Own Asthma Symptoms?

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Background: Asthma affects up to 7 million children in the United States. Adolescents with asthma are a uniquely vulnerable population who tend to minimize illness severity, underreport symptoms, and comply poorly with medications.

Objectives: We compared adolescents' perception of their asthma symptoms with objective measurements of pulmonary function during acute exacerbations in an ED. We hypothesize that adolescents have difficulty accurately perceiving the severity of their own asthma symptoms, potentially limiting traditional approaches to asthma control in this group.

Methods: In this prospective study in a tertiary pediatric ED, patients age 10 - 16 years with an acute asthma exacerbation completed the Acute Asthma Quality of Life Questionnaire (AAQLQ) and the Asthma Control Test (ACT). The AAQLQ measures emotional distress during an asthma exacerbation. The ACT assesses asthma control over the prior 4 weeks. An asthma severity assessment (ASA) score using respiratory rate, work of breathing, oxygen saturation, and wheezing was calculated by the treating physician. Pearson correlation coefficient determined correlation between the ASA score and the AAQLQ and ACT scores. Linear regression evaluated the relationship between age, sex, and asthma history (use of an asthma action plan, controller medication, number of ED visits and hospitalizations for asthma) and AAQLQ, ACT, and ASA scores.

Results: 49 patients have been enrolled to date. The Pearson correlation coefficient comparing ASA to AAQLQ was -0.12 ($p = 0.42$; 95% CI -0.39 to +0.17). The Pearson correlation coefficient comparing ASA to ACT was -0.22 ($p= 0.15$; 95% CI -0.47 to +0.08). Both indicate poor correlation between subjective perception of symptoms and objective measures of disease severity. Linear regression found that a higher number of asthma ED visits correlated with a worse ACT score but that a higher number of hospitalizations for asthma was associated with a better AAQLQ score. No relationship was found between sex or use of an asthma action plan and survey scores.

Conclusions: Adolescents inaccurately perceive the severity of their asthma exacerbations, yet parents may depend on their adolescent children to inform them when experiencing symptoms. This may lead to delayed recognition and treatment of their asthma and increased morbidity and mortality.

Full-scale Human Simulation is Effective in Educating Pre-clinical Medical Students on Basic Acute Care Skills: a Multicenter Study

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ABSTRACT:

Simulation-based training and assessment have gained traction in undergraduate medical education, but their usefulness to preclinical students remains unclear. Employing situativity theory, we developed a simulation module to provide preclinical students with a meaningful context for learning acute care skills. Our objectives were to determine (1) the feasibility of the module for teaching students who have little or no previous experience in managing undifferentiated, critically ill patients; and (2) its impact on students' knowledge and attitudes about critical care. Participants at two medical schools served as their own controls in a pre- and post-intervention design. Students were asked to independently manage a critically-ill patient, after which they received teaching on basic life support principles. We evaluated clinical performance with a critical actions checklist, and knowledge and attitudes with a written pre- and post-test immediately after the experience and six weeks later. Forty-one students participated, of which 34 (83%) were in their first year of medical school. Mean knowledge scores improved from 45.3% (SD±12.78%) to 76.42% (SD±12.06%, $p<0.001$), and retention remained higher than pre-test levels ($p<0.001$). Only 17 (41%) students performed the majority of the critical actions in simulation, yet there was a significant improvement in students' comfort level ($p=0.001$) and self-reported understanding of critical care ($p<0.001$). Students expressed higher interest in critical care after the experience and upon on retesting. These results suggest simulation may foster knowledge and interest in critical care among students prior to clinical training.

Gonorrhea and Chlamydia Assessment, Treatment, and Follow Up in the Emergency Department

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Background: Emergency Departments (ED) are often utilized by patients with complaints related to sexually transmitted infection (STI)[1]. The CDC has guidelines to optimize evaluation, assess risk for sexually related co-infections, promote leniency of empiric treatment in the ED and expedited partner therapy (EPT)[2].

Objectives: This retrospective study aimed to examine the assessment, treatment, education, and follow-up of patients presenting with STI-associated complaints in 2011 to a level 1 Trauma Center's Emergency Department with an annual volume of 51,000.

Methods: To identify an inclusive patient population, two queries were performed: 1). records of patients over the age of 18 in whom a cervical or vaginal G/C culture or urine G/C nucleic amplification probe was obtained in the ED, 2). Records of patients that received STI dosed medications of azithromycin, ceftriaxone and doxycyline. The following parameters were quantified: 1) patients who received empiric antibiotic treatment 2) patients tested for HIV (blood antibody), syphilis (RPR), and/or T.vaginalis (wet prep) 3) patients without antibiotic treatment who subsequently had culture positive G/C and were successfully contacted in follow-up and 4) patients provided EPT.

Results: Eight hundred sixty one patients met the criteria for analysis in this study. Forty-seven patients (5.5%) were positive for Gonorrhea, 86 patients (10.0%) were positive for Chlamydia. Fourteen of these patients were positive for both. Sixty-three patients with positive G/C cultures or probes were discharged from the ED without treatment. The ED failed to contact 14 of these patients for follow-up. Two hundred forty five patients were treated with one of the CDC recommended therapies. One hundred ninety-three patients were treated with the recommended treatment regimen of Ceftriaxone + Azithromycin; 52 were treated with Ceftriaxone + Doxycycline. Fifty-four patients received treatment not consistent with CDC recommendations. Five HIV antibody tests, 11 RPRs, and 636 wet preps were performed on the 861 patients tested for G/C. Only 1 EPT was documented. Seventy-eight partners were advised to seek treatment.

Conclusions: Treatment of patients with suspected STI in the ED frequently differed from the CDC's recommended antibiotic regimens. Only 245 of 299 (82%) patients received treatment consistent with recommendations. Fourteen of the 133 (10.5%) culture or probe positive patients did not have treatment documented. ED physicians did not routinely assess for risk of other STI nor practice EPT.

References:

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2. http://www.cdc.gov/std/ (accessed 9-12-12).

Initial Prospective Analysis of Therapeutic Hypothermia for Inpatient Survivors of Sudden Cardiac Arrest in Comparison to Historical Controls

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Background: Convincing evidence demonstrates that Therapeutic hypothermia (TH) improves neurologic outcomes in survivors of out of hospital sudden cardiac arrest (SCA) from ventricular fibrillation and pulseless tachycardia. Based on limited data, TH is now recommended after SCA for both out of hospital and inpatient survivors from any rhythm.

Objectives: The purpose of this study is to further investigate survival and neurologic outcomes among inpatient survivors of SCA.

Methods: We performed a prospective study of consecutive inpatient survivors of SCA who received TH beginning in August 2009 in comparison to historical controls prior to TH implementation in 2008. Our institution is a 486-bed urban public hospital with a multi-disciplinary Therapeutic Hypothermia team led by Emergency Medicine and Critical Care. Study subjects included inpatient SCA survivors who met inclusion and exclusion criteria in our TH protocol in accordance with the published literature. Descriptive variables included initial cardiac rhythm, time to return of spontaneous circulation, length of stay, pre-arrest diagnosis, baseline neurologic status, as well as SAPS2 and Charleston comorbidity index. Primary study outcomes were survival at discharge and neurologic outcome. Chi-square and Fisher's exact test were performed.

Results: Prospectively, 450 inpatient arrests have occurred since the implementation of TH; 150 patients survived, 22 received TH, and 7 met the inclusion criteria to form the intervention group. Retrospectively, 101 inpatient arrests were recorded in 2008; 56 patients survived, and 7 met the inclusion criteria to form the historical control group. Our control group had a higher mean SAPS2 score & comorbidity index. Survival to discharge was similar at 71% for the intervention and 57% for the control group (p= 0.57). Likewise, good neurologic outcome was not significantly different at 75% for the intervention and 60% for the control group (p=0.63).

Conclusion: Among inpatient survivors of SCA, our initial data demonstrates an encouraging trend towards improved survival and neurologic outcomes with TH. However, there was no statistically significant difference with TH. Further multicenter investigations are needed to obtain a sufficient sample size to definitively answer this important question.

Time to Ultrasound and Emergency Department Discharge in Low-risk Patients with Suspected DVT

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Background: Many patients present to the Emergency Department with swelling or pain in the lower extremities concerning for deep venous thrombosis (DVT). Evaluation can be challenging, as patients often require duplex ultrasound (US) which is time consuming test and in many centers has limited availability based on time of presentation and patient volume. Even patients who are deemed to be low risk by clinical prediction rules such as the Wells' score for DVT frequently have prolonged ED stays while waiting for duplex US. We conducted a prospective observational study to assess what proportion of patients were considered to have a low pretest probability, how many of them were evaluated by D-dimer alone, and the time from presentation to US.

Objective: To describe the clinical course of patients tested for DVT in the ED reporting: structured and gestalt pretest probability of DVT, type and outcome of diagnostic tests used, time to testing, and time to departure from ED.

Methods: We performed a prospective, observational study from August 2012 to November 2012. We included patients evaluated for lower extremity DVT who presented to the ED of a large academic medical center. Prior to test results, a clinical provider (attending, resident or mid-level) independently evaluated each patient and completed a web-based data collection instrument including components of the Wells' Score for DVT as well as overall clinician gestalt. Patients were determined to be low-risk if Wells' Score was less than 2 or if pretest probability was less than 10% based on clinical gestalt. We conducted a structured electronic medical record review to determine time from triage to duplex ultrasound, results of the D-dimer or ultrasound, and total ED length of stay. Any patient who had testing after the clinician was available to document pretest probability was included. We excluded patients, who had US for upper extremity DVT, patients who were evaluated primarily for PE, or patients who were already anti-coagulated for PE or DVT. This was a non-interventional study reviewed by IRB and granted exemption from requirement of written informed consent.

Results: During the time period studied, 90 patients were enrolled. The median age was 54 years. 66% of the patients were female. The overall prevalence of acute DVT found on index visit was 7.8%. 48% of patients were thought to be low risk (<10%) for DVT by their providers and prevalence of DVT in this group was 7.0% (95% CI 1.7% to 12.3%). For these low probability patients 6 underwent D-dimer testing and of these 2 were normal and received no additional testing. For low probability patients, the

median time from initial presentation to duplex ultrasound was 270 minutes and ED LOS was 414 minutes

Conclusion: Clinicians identified 47% of patients as low probability for DVT yet only a minority had D-dimer testing and overall they experienced extended ED length of stay while waiting for duplex US. Increasing utilization of D dimer testing in the evaluation of patients considered to have a low pretest probability for DVT may significantly decrease ED length of stay.

Valproic Acid Toxicity: Do Nontoxicologists Recognize and Treat it with Carnitine?

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Background: Valproic acid (VPA) is widely used and FDA-approved for seizures, migraines, mood disorders and schizophrenia. Hepatotoxicity and/or hyperammonemic encephalopathy may occur as a VPA complication.

Purpose: This study investigated current practice of screening for these VPA toxicities as well as the use of carnitine as an antidote at the study site.

Methods: A retrospective review was performed on patients in a tertiary care Emergency Department (ED) from 10/1/10 to 9/30/11 with VPA listed as a current medication in the electronic health record. A Clarity search identified study patients. A standardized data extraction tool was developed. Descriptive statistics included Fisher's exact test for dichotomous variables. Analyses were conducted using SAS software.

Results: A total of 777 encounters were identified, of which 328 did not involve VPA-associated issues and 127 involved patients not initially on VPA. Of the remaining 322, 74 (23%) were admitted and 248 were discharged. In the 322 encounters, altered mental status (61.8%; n = 123) and seizures (20.5%; n = 66) were the most common presenting symptoms. Ammonia concentrations were measured in 0.62% (n = 2) of ED only encounters and 4.66% (n = 15) of admissions ($p = <0.0001$). Patients evaluated by a toxicologist were significantly more likely to have an ammonia concentration obtained (5/6 vs. 12/316; $p < 0.005$). Pre-encounter carnitine therapy was found in 2% (n = 6) of the 322; carnitine therapy was initiated in 50% (n = 3) of patients with a toxicology consult and 0% without ($p < 0.0001$).

Discussion: Patients taking VPA may present with related complications, often requiring inpatient management. Carnitine was used in relatively few patients with potential VPA complications. Toxicologist input increased monitoring for hyperammonemia as well as antidotal therapy with carnitine.

Conclusions: Education of nontoxicologists is needed to increase awareness of VPA-related complications, diagnosis and management.

The Next Generations' Journal Club: An Innovative Approach to Multimedia and Evidence Based Medicine

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Background: Residents use podcasts as sources for current discussion regarding medical literature, procedural techniques, and to glean approaches to clinical scenarios from the perspective of other institutions. Concerns have been voiced by residency leadership at national meetings regarding resident use of podcasts, as they are often the project of individuals from a variety of settings, are not peer reviewed, and enjoy wide exposure.

Objective: To design and implement a unique educational innovation by combining our monthly evidence based medicine lectures wherein we review medical literature with an assigned podcast that discusses the pieces of literature in question. We hypothesized that this unique lecture format would give residents the tools to analyze primary medical literature while simultaneously critically considering the discussion of the literature by author of the podcast.

Implementation: Each month, a group of residents is assigned to select and distribute a podcast and review two studies that are referenced during that podcast. At a residency conference, the group of residents presents their appraisal of the medical literature, specifically the methods, results, conclusions, and internal/external validity. This is followed by information about the podcast, as in the author, setting, conflicts of interest, and the extent of dogmatism versus evidence based approaches. Then, the validity of the podcast commentary pertaining to the pieces of literature in question is discussed

Results: Residents have been very satisfied with this innovation. An online platform was designed to allow for commentary and description of our project. This can be found at www.emergency.posterous.com.

Conclusion: Analyzing relevant journal articles in emergency medicine and podcasts which discuss them in a resident lecture format offers a unique and novel approach to teaching residents to critically appraise both literature and podcasts.

Rush University Medical Center First Aid and CPR Training Course for Junior ROTC High School Students

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Background / Introduction: Early interventions with Cardio Pulmonary Resuscitation (CPR), Automatic External Defibrillator (AED) and other first aid have shown to make significant differences in patient outcomes. High school students are typically not targeted for training in early pre-hospital medical interventions. Given the significant numbers of traumatic and non-traumatic out- of- hospital medical emergencies, it is appropriate to include this cohort in training of first aid and CPR. In the in-hospital setting, emergency physicians (EPs) are first in line in resuscitation and in providing immediate first aid. Typically, EPs are certified as providers and instructors for Advanced Cardiac Life Support (ACLS) and Pediatric Advanced Life Support (PALS), and, therefore, are a good choice to be the trainers for introductory courses, such as American Heart Association Heartsaver®/CPR/ AED. Rush University Medical Center (RUMC) EPs have implemented a one day course for Junior Reserve Officers' Training Corps (JrROTC). We chose JrROTC students because of their values of dedication, commitment, integrity and selfless service, all enveloped in the leadership role they are taught. In this study, we show improvement in knowledge base of first aid and CPR in the chosen cohort.

Methods: Forty four high school students from JrROTC programs in the city of Chicago participated in a one day, 8 hour course on RUMC campus. The instructors, EPs from RUMC, collaborated with RUMC Training Center. The Heartsaver®, First Aid and CPR/AED courses from American Heart Association delivered in 2 sessions of 2.5 hours of didactic and skills training, 2 sessions of 1 hour pre and post surveys and 20 question pre- and post-tests. Exams and surveys administered on survey monkey, and Chi square test was used to analyze pre- and-post test scores. Finally, the course concluded with a 1 hour session on introduction to healthcare fields and graduation ceremonies.

Results: 44 high school students completed the course, comprised of 33 females and 9 males (1 did not complete survey), ages 14-18 years old. The group consisted of 2 freshmen, 9 sophomores, 22 juniors and 10 seniors. The majority of the students have been JrROTC members for more than 2 years (63.9%).
The testing revealed a significant improvement in students overall knowledge, with mean scores of 13.5 ± 2.5 for pre-test and 18 ± 1.5 for post-test ($p < 0.001$). From the post-survey, majority of students (97%) felt that course objectives were clear and the

same number agreed that content was presented clearly. Furthermore, the number of students who felt comfortable providing first aid went from 55.8% before the course to 97% after the course. 97% of students agreed or strongly agreed that they would respond in an emergency because of the skills learned in the course.

Conclusion: Our course demonstrated significant improvement in knowledge base of the course participants. We will re-survey and re-test students at a later time to evaluate retention of knowledge and skills learned. Highly motivated high school students, such as JrROTC members are an appropriate cohort to receive training for American Heartsaver®, First Aid, and CPR/AED courses. Such training can be offered in one day by utilization of comprehensive didactic and hands on sessions. Emergency physicians certified as ACLS /PALS instructor are a fitting choice to implement this type of courses. Finally, these courses can be utilized to expose young students to health care fields and provide students with opportunities to develop leadership roles in their schools and communities.

Faculty and Resident Perception of Service Versus Education During EM Residency

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Abstract

Study Objective: To determine if residents and faculty agree on the educational value of common procedures, tasks, and didactics in an emergency medicine (EM) residency. A question from the Accreditation Council for Graduate Medical Education resident survey has introduced confusion regarding definitions of the terms, “clinical education” and “service obligation”

Methods: Our institutional IRB approved the following research design. Internet-based voluntary anonymous survey; developed by consensus between residents and EM faculty, was sent to seven EM residency programs. Respondents rated the educational value of procedures, tasks, assignments, and clinical scenarios using a scale of 0%, 25%, 50%, 75%, and 100%. Descriptive statistics and differences between faculty and residents were calculated using Mann-Whitney U. Significance was set at .05

Results: 174/439 (39.6%) surveys were completed; 102 (58.6%) residents (R) and 72 EM physicians (MD). 59.8% of residents were male; 21.3% PGY1, 14.4% PGY2, 18.4% PGY3, and 4.6% PGY4. 62.0% of attendings were male. Both groups agreed on high educational value of: central venous lines (75.4% (R) versus 71.5%; P=.227); transporting an unstable patient (61.3% (R) versus 55.2%; P=.227); performing x-ray follow up (66.2% (R) versus 65.6%; P=.815); evening journal club (89.0% (R) versus 93.1%; P=.418); and low educational value of: routine blood draw (13.5% (R) versus 16.0%; P=.199); routine transport (8.1% (R) versus 6.9%; P=.874);. Groups disagreed on value of urinary catheter insertion (12.8% (R) versus 18.8%; P=.008); escorting patients from the waiting room (6.1% (R) versus 12.1%; P=.001); handing CT contrast to patients (8.6% (R) versus 3.5%; P=.020).

Conclusion: In this multi-centered study, attending and residents agree on the educational value of 8/9 procedures and 21/22 tasks. Lectures, didactics and journal clubs are universally accepted as educational. This survey provides that there is strong agreement between resident and EM attending definitions of “clinical education” and “service obligation”.

Associations of Piercings, Tattoos and Sexual Transmitted Disease in the Emergency Department

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Abstract

Introduction: Sexual transmitted diseases (STD) are commonly diagnosed in emergency departments and can be associated with significant morbidity and mortality. Multiple previous studies have associated the presence of tattoos with sexual behavior. Studies among medical professionals have demonstrated negative attitudes toward patients with piercings or tattoos suggesting a preconceived association with STD's and high risk behavior.

Study Objectives: Does the presence of tattoos or piercings on a patient allow a clinician to suspect a history of, or greater risk for STD's?

Methods: Voluntary anonymous paper-based survey of female adult patients age 18-50 presenting to the emergency room (ED) of two urban ED with a medical complaint and discharged. Excluded were patient that are unable to read, write and understand English or too ill to cooperate. Following IRB approval, written consent was obtained by Emergency Medicine (EM) residents and attending physicians from a convenience sample in the emergency department. Patients were asked to fill out a short questionnaire regarding sexual activity, sexually transmitted diseases history, and partners. The enrolling physician then recorded patients' piercing and tattoos on a body diagram. Comparisons between groups were tested using Student t, Chi-squared, or one way ANOVA as appropriate. Significance was set at .05 A sample size of 40 was determined to provide .80 power to find at least a 30% difference between groups.

Results: 41 surveys were collected with 40 having completed data. All respondents were females with mean age of 30.4 (Range:18-48; SD: 9.1). The respondents fell into four groups: 14 (35.0%) women with ear piercing only, 6 (15.0%) women with body piercing, 11 (27.5%) women with tattoos, and 9 (22.5%) women with both tattoo and body piercing. 57.5% (23/40) reported at least one prior STD (range: 1-4) and the average number of sexual partners reported was 6.0 (SD:4.0). 90% (36/40) reported having unprotected sex in the past. There was no significant difference between the groups in past STD reported (P=.816) or number of partners (P=.580). There was a significant association between number of partners and past STD (7.2 versus 4.3; P=.016)

Conclusion: This survey of a convenience sample of young females seen in the emergency department showed no significant association between body piercings, and or tattoos with number of sexual partners or history of sexually transmitted diseases.

Not surprisingly, there was a significant association between number of past STD and number of sexual partners.

Key Words: Body Piercing, Tattoo, STD, Survey

Progression of Left Ventricular Diastolic Dysfunction in an Urban Population

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BACKGROUND: Approximately 50% of heart failure cases are due to diastolic failure**.** Generally, it is thought that asymptomatic diastolic dysfunction precedes the development of diastolic heart failure, representing an ideal time for intervention. Previous studies have examined progression rates in non-minority populations.

OBJECTIVE: To determine the rate of diastolic dysfunction progression in a predominately ethnic minority population and the associated risk factors.

DESIGN, SETTING, a nd PARTICIPANTS: A retrospective cohort study of an echocardiogram database and Electronic Health Record (EHR) for an academic medical center. Individuals with echocardiograms showing diastolic dysfunction during a 6-year study period (2006-2012) were selected.

MAIN OUTCOME MEASURES: Change in diastolic function grade as a function of time and the factors influencing this change.

RESULTS: During the 6-year retrospective cohort study period, there were 154 patients in the database with 2 or more echocardiograms demonstrating diastolic dysfunction; representing 496 echocardiograms. The mean time between echocardiograms was 2.6 years. The mean age was 64.6 (±10.1) with 81 % female and an average BMI 30.5(±7.4). Demographics were similar across all race/ethnicity groups with slightly younger age and higher percentage of obesity among ethnic minorities. The majority of subjects had Grade I diastolic dysfunction at the initial examination (N=135 (87.7%)). Approximately 27.9% (n=43) of the study cohort demonstrated overall worsening grade of diastolic dysfunction. Diastolic dysfunction grade was unchanged in 62% (n=96), improved in 9.7% (n=14), and worsened then improved in 0.7% (n=1).

CONCLUSIONS: Our study showed only a slightly higher rate of diastolic dysfunction progression in this predominately minority population than previously reported in the literature. Nonetheless, this confirms previous studies in nonminority population cohorts demonstrating the progressive nature of diastolic dysfunction over time. Understanding the role of superimposed risk factors for cardiovascular disease in accelerating progression rates from asymptomatic diastolic dysfunction to symptomatic stages in is paramount to optimize intervention strategies.

Factor Eight Inhibitor Bypassing Activity (FEIBA) for the Rapid Reversal of Life-Threatening Hemorrhage in Patients with Warfarin-Induced Coagulopathy - Proposal for an Observational Study

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Background: The historical mainstay for immediate reversal of warfarin-associated coagulopathy in patients with life-threatening hemorrhage is intravenous fresh frozen plasma (FFP) and intravenous (IV) vitamin K. FFP has several disadvantages including a large volume of infusion, prolonged reversal time, risk of disease transmission, transfusion-associated lung injury, and incomplete reversal of coagulopathy. In 2012, the American College of Chest Physicians recommended that four-factor prothrombin complex concentrate (PCCs) replace FFP for the rapid reversal of warfarin-associated coagulopathy associated with major bleeding. Factor Eight Inhibitor Bypassing Activity (FEIBA) is a four-factor prothrombin complex concentrate combining inactivated and activated factors. Our hospital developed standardized warfarin coagulopathy reversal guidelines in 2012, replacing FFP with FEIBA.

Objectives: Our hypothesis is that patients who receive FEIBA according to new hospital guidelines will have reduced time to INR reversal, without a significant increase in adverse events, compared to historical controls.

Methods: In this prospective observational study, we plan to enroll consecutive patients arriving to the Emergency Department (ED) with warfarin-associated coagulopathy (INR $\geq$ 1.5) and life threatening bleed as defined by the International Society on Thrombosis and Haemostasis, who receive FEIBA according to our hospital's new guidelines. Patients will be followed for the primary outcome of time to reversal of coagulopathy. INR on arrival will be compared to INR drawn 30 minutes, 4 hours, and 24 hours after FEIBA administration. All patients will also receive 10 mg IV vitamin K. Secondary outcomes include hospital and ICU length of stay mortality, thrombotic adverse events (stroke, myocardial infarction, deep vein thrombosis, pulmonary embolism or arterial thromboembolism) and allergic reaction. Cerebral Performance Category will be determined at time of hospital discharge and at 28-day follow-up. We plan to enroll approximately 60 patients, with the sample size determined for the primary outcome and based on existing published data comparing reversal times for four-factor PCCs and FFP.

Expectations: We anticipate that patients who receive FEIBA according to the new hospital guidelines will have reduced time to INR reversal, without a significant increase in adverse events, compared to historical controls.

A Novel Online Curriculum for Fourth-Year Medical Students

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Background: In our busy urban emergency department, there is limited faculty time to give monthly in-person traditional lectures to fourth-year medical students. Faculty generally focus on topics seen with high frequency, leaving other important subjects, though less common, not formally taught. Thus, a novel online curriculum was developed to not only target this potential gap in the fourth-year curriculum, but also to evaluate this method of learning.

Study Objectives: We sought to evaluate 2 main objectives: first, would fourth-year medical students be able to retain knowledge from a novel online curriculum; second, would students prefer this method of learning over traditional live in-person lectures.

Methods: We developed 5 online voiced-over Powerpoint presentations. On the first day of the rotation, we pretested them with questions derived from these lectures. We then provided access to this online curriculum which the students could review at their leisure. Toward the end of the 4 week rotation, we post-tested and surveyed the subjects.

Results: Data collection is in its early stages. Three months of data have been collected. Twenty-one subjects completed the pretest, post-test, and survey. Eleven subjects reported watching 3 or more lectures. This group improved an average of 6.1 points (24.4%) on the post-test (0 to 14 points). The other 10 subjects reported watching less than 3 lectures. On average, they improved 0.3 points (1.2%) on the post-test (-4 to 7 points). Furthermore, a majority of students indicated a preference for inclusion of online teaching. Fourteen of 21 preferred either online only or a mixture of live and recorded lectures.

Conclusions: Although still in its infancy, the results are promising. Understandably, students who viewed the online curriculum demonstrated more improvement on the post-test than their counterparts who did not view the online modules. This does, however, bolster the idea that as a learning tool, students can retain information, at least in the short term, from online recorded lectures. Additionally, students overall reported a preference for integration of an online curriculum. We will continue to gather data, but if this trend holds, we may consider adjusting our curriculum accordingly.

Use of the Delphi Method and Simulation to Pilot Differentiated Milestones for Cardiovascular Emergencies for Emergency Medicine Residents

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Background:

- Despite known limitations of hour-long lectures, this format remains the dominant educational modality used today for GME. In part, this is driven by the need to meet RRC requirements
- The ACGME has recently evolved from a competency-based curriculum to the achievement of milestones. While initial milestones have been established, significant gaps remain and milestones have not yet been established for EM residents regarding cardiovascular (CV) emergencies.
- The EM model of clinical practice provides guidelines, but not specific learning objectives, methods of teaching, or criteria for mastery of content. Furthermore, The Next Accreditation System (NAS) put forth by the ACGME calls for reform of the traditional process-based approach to medical education, wherein requirements were met simply by attending instructional sessions.
- Instead, innovative teaching methods and a focus on desired outcomes trump the age-old routine of passive learning by hour-long lectures. With this in mind, we aim to design a new curriculum as outlined below.

Objectives:

1) Develop draft milestones for EM residents regarding CV emergencies
2) Establish differentiated objectives for knowledge and skills between junior and senior residents
3) Incorporate innovative teaching methods using simulation

Methods:

- Using the Delphi method, we have established objective criteria for milestones in four areas of CV emergency management: atrial fibrillation, acute heart failure, AVNRT/AVRT and STEMI/NSTEMI.
- Expert EM faculty members were asked to edit iterative surveys containing objectives differentiated by PGY, distributed weekly for six weeks. Group consensus was obtained to achieve a list of comprehensive, differentiated objectives.
- Macro simulations were designed for each of the 4 CV encounters using the template of case, brief review followed by group review.
- These simulation sessions were used to assess criterion fulfillment of milestones and for both formative and summative evaluation.

Innovations in Medical Education

- Rather than the traditional lecture format, traditional conference time was used for simulation
- Junior and Senior residents were divided to allow for differentiated learning objectives
- Residents were then randomly paired for the simulation cases
- Residents would complete the case, receive a focused performance-based debriefing of the simulation, then all learners would gather to reflect and learn from shared experiences.
- Residents then progressed to the next case with a different faculty member

Conclusion: This pilot of a draft curricular framework may aid in milestone development for specific CV emergencies and lead to improved clinical performance by EM residents. If so, this framework may be used to remodel other units within our EM curriculum.

Development and Implementation of a Novel Resident-Resident Peer Evaluation Tool in an Emergency Medicine Residency

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Background: The ACGME and RRC for EM require 360-degree evaluations as a part of learner feedback. Our four-year EM program has resident-faculty and faculty-resident evaluations but lacks a resident-resident feedback system. We have a graduated responsibility model where senior residents supervise junior residents; therefore, we wanted our evaluation process to reflect these interactions.

Objective: To develop a resident-resident evaluation tool that complies with the ACGME 360-degree evaluation requirement

Methods: EM residents and faculty developed an evaluation tool to provide resident-resident feedback. Our instrument was based on data from literature review, focus groups and existing evaluations. We piloted our survey to junior residents to evaluate a sample of six senior residents from April-May 2012. The initial survey contained seven questions with a 5-point Likert scale. Use and feedback prompted subsequent revisions to create our final tool.

Results: All junior residents (n=24) received the pilot survey; 21 evaluations were submitted. Twelve residents completed at least one evaluation (response rate 50%). Each senior resident received at least two evaluations. Feedback from this survey and focus groups indicated the need for direct questions emphasizing comments. We condensed the survey to three questions with a 3-point Likert scale with prompts for comments to assess knowledge, patient care, and interpersonal skills.

Conclusion: We developed a novel resident-resident evaluation tool which provides our residents with peer feedback, a unique perspective from traditional evaluations. Our data suggest our tool is easy to use and interpret. The online format allows tracking of participation and feedback which is critical in documenting milestone achievements. We will compare resident-resident and faculty-resident evaluations to assess for validity. We believe this survey will be a valuable addition to other residencies as part of their 360-degree evaluations.

Defining the Normal Postictal Duration for a Simple Febrile Seizure

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Abstract

Objective: The postictal period associated with simple febrile seizures has been referred to as brief. The objective is to provide a numeric value to define the expected duration of the postictal period. The implications that the postictal duration has between workup and length of stay in the Emergency Department will also be explored.

Methods: A retrospective chart review was conducted for 306 children that were treated for seizures in an urban Chicago general Emergency Department. Of those patients, 150 were found to fit the AAP diagnosis criteria for a simple febrile seizure. The average postictal time was calculated for these 150 patients. In an effort to further explore the clinical factors that are correlated with various postictal durations, variables such as TMax, length of stay, and ambulance arrival vs. walk-in were also studied

Results: The postictal durations for febrile seizures ranged from zero to 33 minutes, with the average being 8.8 minutes. The mode for this data set was zero minutes. Using two standard deviations to eliminate outliers, the range was found to be zero to 27.6 minutes. The average length of stay in the Emergency Department was 99 minutes. Ambulance-arrival patients had an average postictal duration that was 3.1 minutes longer than the average for walk-in patients (Ambulance-9.5min., Walk-in-6.4min.). Patients with a Tmax greater than 103 degrees Fahrenheit had an average postictal duration that was 1.1 minutes less than patients with a Tmax less than 103 degrees (Tmax>103-8.3mins, Tmax<103-9.4mins).

Discussion: The purpose of the study was to determine the expected postictal period associated with a simple febrile seizure. It can be suggested that patients with a postictal duration outside the range determined in this study (zero to 27.6 minutes) that otherwise fulfill the diagnostic criteria for simple febrile seizures should be carefully evaluated for further ED workup or possible hospital admission.

EKG Patterns as Predictors of Pulmonary Embolism

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Background: Electronic medical records are a relatively new technology that allows emergency physicians to quickly review patient's previous medical records including previous EKGs. Multiple previous studies have looked at EKG patterns predictive of pulmonary embolism at time of pulmonary embolism diagnosis, though none have examined EKG changes in these patients when compared with their previous EKGs.

Study Objective: To identify the most common EKG changes in patients with known pulmonary embolism when their EKGs are compared with their previous.

Methods: Retrospective chart review from 2008-2012 of patients with known pulmonary embolism comparing their presenting EKGs with those obtained prior to the diagnosis of pulmonary embolism. Patients were deemed eligible for the study if the pulmonary embolism was diagnosed by either CT angiography or high probability ventilation-perfusion scan.

Results: 67 cases were reviewed. The mean age was 62 years with 69% being female. The average duration of time from previous EKG to EKG at presentation was 15 months (Range: 1day - 45months). The most common change noted was sinus tachycardia (48%), followed by T-wave inversion (30%), T-wave flattening (24%), and ST-depression (12%). T-wave changes and ST-depression, when present, were most common in the inferior and lateral leads. 22% of patients had no change in their EKG.

Conclusions: The most common EKG change when compared to previous in the setting of pulmonary embolism is sinus tachycardia, present in approximately half of cases. New T-wave changes and ST-depressions are present in a minority of these patients. Approximately one-quarter of patients with pulmonary embolism will have no change in their EKG.

When There's Nowhere to Go But Up: Vertical Expansion of the Emergency Department

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Background: Increasing patient volumes may require increased ED bed capacity. In the urban setting, typical horizontal space expansion may be unavailable; however, vertical expansion (a second floor) is a rarely utilized option.

Objectives: Describe the history, logistics, quality, safety, and operational metrics associated with a novel vertical expansion of an ED at an academic, urban, level 1 trauma center, with 85,000 visits/year. The purpose of this approach was to match increasing patient volume with bed capacity in a safe, timely, and equitable manner.

Methods: Initial use of the second floor observation unit as hybrid observation/ED space began in 2005 to expand capacity with the evaluation of a select group of ED patients. Initial patient encounters were limited to low complexity, moderate acuity patients typically in an ESI III category, which was felt to be a safe model of care.

As demand continued to increase, a new dedicated emergency care space was built in 2010 to replace the previously used hybrid unit. With the incorporation of a care space more conducive to higher acuity emergency care, the ED transitioned to a 24/7 two floor model of care that was less selective in acuity distribution.

Specific metrics/indicators were as follows: bed capacity, percent of patients seen on second floor, length of stay, left without being seen, door-to-doctor time, patient satisfaction, and adverse events related to the expansion.

Results: After expansion, the number of patients seen in the second floor space doubled (from 16.5% of total visits to 31.5%). Only one serious adverse event occurred (related to transport) in 85,857 patient encounters.

(table 1)

Conclusion: Vertical expansion of an ED into a two—story ED that operates 24 hours/day offers a unique, safe, and feasible option in the space limited setting of an urban ED.

Table 1. Operation metrics for a novel second floor emergency care space expansion.

	Before Expansion 6/1/09-5/30/10	**After Expansion** 6/1/10-5/30-11
Total # Ed/observation Beds	54 (with option for 16 extra hallway beds)	57 (with option for 20 extra hallway beds)
ED Volume	83,551	85,857
% ED patients evaluated on 2nd floor	13,786 (16.5)	27,058 (31.5%)
Avg. Total Length of Stay	5.01 hours (SD 62.9)	5.43 hours (SD 73.8)
LWBS	2,903 (3.47%)	3,218 (3.75%)
Avg Door-to-Doctor Time	1.16 hours (SD 52.9)	1.07 hours (SD 1.1)
Overall Patient Satisfaction	81.9%	82.5%

A Survey of Graduating Emergency Medicine Residents' Experience with Cricothyrotomy

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BACKGROUND: The Emergency Medicine Residency Review Committee stipulates that residents perform three cricothyrotomies in training but does not distinguish between those done on patients or via other training methods. OBJECTIVE: This study was designed to determine how many cricothyrotomies residents have performed on living patients, the breadth and prevalence of alternative methods of instruction, and residents' degree of comfort with performing the procedure unassisted. METHODS: EM residents nearing graduation were surveyed utilizing the web. Data regarding the number of cricothyrotomies done on living and recently deceased patients, animals, and models/simulators were gathered. Residents indicating experience with the procedure were asked additional questions as to the indication, supervision, and outcome of their most recent cricothyrotomy. Data were also collected regarding experience with rescue airway devices, observation of cricothyrotomy, and comfort ("0-10" scale with "10" representing complete confidence) regarding the procedure. RESULTS: Of 296 residents surveyed, 22.0% performed a cricothyrotomy on a living patient, and 51.6% had witnessed at least one performed. Those who completed a single cricothyrotomy reported a significantly greater level of confidence, 6.3 (95% CI 5.7-7.0), than those who did none, 4.4 (95% CI 4.1-4.7), $p<<0.001$. Most respondents, 68.1%, had utilized the recently deceased to practice the technique, and those who had done so more than once reported higher confidence, 5.5 (95% 5.1-5.9), than those who had never done so, 4.1 (95% CI 3.7-4.5), $p<<0.001$. Residents who practiced cricothyrotomy on both simulators and the recently deceased expressed more confidence, 5.4 (95% CI 5.0-5.8), than those who utilized only simulators, 4.0 (95% CI 3.6-4.5), $p<<0.001$. Neither utilization of models, simulators, or animals, nor observance of others' performance of the procedure independently affected reported confidence among residents.

CONCLUSIONS: While prevalence of cricothyrotomy and reported comfort with the procedure remain low, performing the procedure on living or deceased patients increased residents' confidence in undertaking an unassisted cricothyrotomy upon graduation in the population surveyed. There is evidence to show that multiple methods of instruction may yield the highest benefit, but further study is needed.

Implementation of a Triage Testing Protocol Reduces Left Without Being Seen Rates for Patients with Abdominal Pain

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Background: Overcrowded emergency departments across the United States have increased the times patient wait to receive medical evaluation. As a result, many patients leave prior to that evaluation. Studies have shown that patients who leave without being seen (LWBS) by a physician are often quite ill and have poor outcomes. Various methods have tried to reduce the LWBS rate, none of which has proven to combine reasonable cost with effectiveness. The Emergency Department (ED) at Advocate Christ Medical Center started a protocol in February of 2010 allowing blood tests to be ordered and collected for patients presenting with a chief complaint of abdominal pain while in the waiting room, before evaluation by a physician.

Objective: We plan to retrospectively examine the number of patients who presented to the ED with abdominal pain before and after the institution of this protocol, and to examine the effect on the LWBS rate.

Methods: Patients who presented to the ED between 2008 and 2012 with a chief complaint of abdominal pain were identified by searching our electronic medical record (EMR) with the keywords “abdominal pain”, “epigastric”, “abd”, “quadrant”, “rlq”, “llq”, and “suprapubic”; patients 18 years or younger were excluded. Identified patients were divided into before and after groups based on the institution of our triage lab protocol in February 2010. Disposition was abstracted from the EMR. We combined all disposition options where patients left before having contact with a physician as LWBS, and excluded patients who went immediately to labor and delivery; all other dispositions were included as having been seen by a physician. Basic demographic information was also collected. The data presented in this abstract are part of an ongoing study.

Results: During the study period prior to our triage lab testing protocol, 4472 people presented with abdominal pain, and 322 LWBS (7.2%); 68.8% were women, with a median age of 40 (IQR 29-56).During the study period after the protocol was introduced, 5522 people presented with abdominal pain, and 251 LWBS (4.5%); 69.5% were women, with a median age of 41 (IQR 28-57). Using chi square analysis, the difference between the LWBS rates (7.2% and 4.5%) was significant ($p<0.0001$), with an OR of 0.61 [95% CI of 0.51 to 0.73] for LWBS after introduction of our triage protocol.

Conclusion: The addition of testing protocols initiated at the time of triage decreased the LWBS rate of patients presenting to our ED with a complaint of abdominal pain.