ILLINOIS COLLEGE OF EMERGENCY PHYSICIANS

2011 ICEP Spring SYMPOSIUM

& ANNUAL BUSINESS MEETING





Research Abstracts

STATEWIDE RESEARCH SHOWCASE

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Resurrection Health Care

2011 ABSTRACTS
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Statewide Research Showcase

* Abstract was selected for presentation at the 2011 Spring Symposium

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2011 ICEP Spring SYMPOSIUM
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A Novel Army Training Program Improves National Guard Medics' Combat Trauma Readiness

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Background: Nearly 90% of U.S. combat deaths occur on the battlefield before the casualty ever reaches a treatment facility. It is imperative to develop a training program that renders army medics ready for the myriad of traumatic injuries.

Objectives: The objective was to measure the effectiveness of an intensive multi-modality five-day training program in improving the readiness of the military personnel in the setting of acute combat trauma injuries in pre-hospital setting.

Methods: The study took place at an urban tertiary care center from May 2007 to September 2010. The Advanced Trauma Training Program (ATTP) was developed by emergency physicians who are International Trauma Life Support (ITLS) instructors. The program consisted of: didactic ITLS material; special skills training stations; hands-on laboratory sessions; observational trauma experience; ambulance ride-alongs; Basic Disaster Life Support (BDLS) course; and a multiple casualty practicum.
94 military personnel completed pre and post-training tests, along with post-training course evaluations. Evaluations post-deployment to combat zones were also collected from 32 returning participants.

Results: The average pre-training test score of the 94 participants was 65.5%, that increased to 89.14% post-training scores were 89.14% ($p<0.001$; paired t-test). Of the 94 participants, 49 were deployed to combat zones, of whom 47 found the ATTP course important overall (96%). In addition, 28 out of the 32 participants returning from combat zones reported using the skills learned. The most useful skills were reported to be spine immobilization (24/32), wound care (19/32), bag-valve-mask use (14/32), and suturing (12/32).

Conclusions: Trauma training is an essential area of competence for the military personnel before deployment to conflict zones. Participation in an intensive advanced trauma training program demonstrated a significant increase in trauma readiness among course participants; in addition, course evaluations and self-assessments highlight the importance of such an intensive course for pre-deployment military training.

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Healthcare Worker Availability In A Mass Casualty Incident: Impact Of The 2009 H1 N1 Influenza Pandemic

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Background: Chemical, biological, radiological, nuclear and explosive (CBRNE) accidents or terrorist acts can cause mass casualty incidents (MCIs). Healthcare workers (HCWs) may be unwilling or unable to participate in CBRNE MCIs. In March 2003, emergency department (ED) HCWs were surveyed on willingness to work during MCIs. From spring 2009 to June 2010, HCWs experienced the H1N1 pandemic.

Objectives: Objectives were to determine current willingness of ED HCWs to participate in CBRNE MCIs and to compare 2010 results to 2003. Additional objectives were to assess the impact of the H1N1 pandemic on ED HCW willingness to participate in MCIs and attitude regarding pandemic management and vaccination.

Methods: In April 2010, a survey of ED HCWs was done at the same urban, tertiary care, Level 1 trauma center, teaching hospital previously surveyed in 2003. The survey tool about willingness to participate in MCIs was identical to the 2003 tool and was followed by H1N1 questions. HCWs were asked if the H1N1 experience influenced willingness to participate. The tool was distributed to all ED/trauma physicians, nurses, technicians, secretaries and security staff. Completion was voluntary and anonymous.

Results: Response rate was 78% (98 of 126).

Percent of HCWs Willing to Remain at Work in an MCI			
MCI	2010	2003	Difference
Chemical	79%	74%	+5
Biological	74%	70%	+4
Nuclear	72%	69%	+3
Trauma	94%	86%	+8

Differences in 2010 and 2003 HCW willingness to *remain at work* were statistically significant in each CBRNE MCI scenario (paired t-test, $p < 0.05$). If HCWs needed to *come in from home*, overall there was a further 6% decrease in willingness to participate in 2010 versus 13% in 2003. Following the H1N1 experience, 27% of HCWs felt more

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comfortable in a biological MCI, 11% less comfortable, 62% no effect. Fifty-nine percent felt ED patient and HCW needs were met most of the time during the H1N1 MCI. Regarding planning and provision of information for HCWs, 64% felt the hospital and 46% felt public health agencies performed adequately. Mandatory HCW vaccination was supported by 49%; H1N1 vaccine was received by 58%.

Conclusion: In 2010, an increase in HCW willingness to participate in each CBRNE MCI scenario was found. Most HCWs did not feel an effect from their H1N1 experience. The low mortality of 2009 H1N1 may have been a factor. Interval study site factors that may have been important were improved training and implementation of support policies (child, elder and pet care) addressing barriers identified in 2003. Further study of all HCWs' attitudes on CBRNE MCI is needed.

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Healthcare Workers and the Mandated H1N1 Vaccine: A Survey to Assess Employee Perception

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Introduction: Given the recent H1N1 Influenza pandemic of 2009, the discussion regarding mandatory hospital employee influenza vaccination has resurfaced. A community medical center in Chicago, Illinois instituted a mandatory employee influenza vaccination policy for the 2009-2010 influenza season. This survey study queried healthcare workers regarding their perceptions of the H1N1 influenza virus, the vaccine, and the mandated vaccination policy.

Method: Prospective voluntary 17 question paper-based survey of health-care workers in “high-risk” hospital departments. Outcome measures include vaccination rates, attitudes regarding vaccinations, and perceptions of the new mandatory policy.

Results: Of the 202 responses, 91.6% received mandated vaccinations; 54.6% before the mandate and 45.4% after the mandate. Among highlights of the study, 25.2% stated it was their duty to be vaccinated and 30.7% felt it would protect patients and prevent employee sick days. In opposition to the mandate, 31.7% responded that it was an infringement on their rights and 17.3% held the opinion that most staff would have taken the vaccine voluntarily, obviating the need for the mandate. The consequences of eventual termination for refusing the mandated vaccine generated a spectrum of attitudes; 20.3% of hospital employees deemed it as an appropriate penalty, 43.7% regarded it as an unfair punishment, 3.5% stated they would electively seek employment elsewhere, and 32.5% answered unsure.

Conclusion: This data sheds light on controversial ethical arguments regarding mandatory vaccination and identifies barriers and misconceptions held by healthcare workers. Although 30.7% felt that mandated vaccination would benefit patients, 31.7% felt an infringement on their rights.

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Antibiotics and Supratherapeutic INR in the Elderly

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Introduction: Warfarin is the most commonly used long-term anticoagulant in the United States and certain antibiotics have been observed to potentiate its effects.

Study Objectives: Review data concerning patients on chronic warfarin therapy with a supratherapeutic INR when seen in the Emergency Department (ED) and correlate INR findings with antibiotic use both in the ED and as outpatients.

Methods: Five year retrospective chart review from a community ED with 40,000 annual visits. Inclusion criteria included age ≥65, on warfarin, INR ≥ 4.0, and no trauma. Data included 4 weeks medications, laboratory values, chief complaint and disposition. Descriptive statistics were analyzed and group comparisons made with Chi-squared and Student t-tests.

Results: 169 patients (42.6% male) met inclusion/exclusion criteria and had mean age 0f 80.7 years (SD: 7.5; Range: 65-97). 42 (24.8%) were on both warfarin and ASA, 7 (4.1%) on both warfarin and clopidogrel and 5 (3.0%) on all three: warfarin, clopidogrel, and ASA. 34 (20.1%) patients had been on an antibiotic in the last 4 weeks and 68 (40.2%) were given antibiotics in the ED despite an elevated INR. The mean initial ED INR was 5.55 (SD: 1.45) with 75% between 4.0 and 6.3. Of the 68 patients given an antibiotic in the ED, regardless of prior antibiotic use, 15 (22.1%) had an increase of their INR within 24 hours following ED treatment, significantly higher than the 7.9% INR increases for those patient not receiving antibiotics in the ED (RR=2.76; 95%CI: 1.25, 6.21; P=.009). 22 (64.7%) of the outpatient antibiotics and 39 (57.4%) of the antibiotics given in the ED are known to react with warfarin including quinolones (35.3%) and macrolides (11.8%). However there was no significant difference found in the mean INR of patients depending on prior antibiotic usage or antibiotic type.

Conclusion: In this study, 20.1% of elderly patients on warfarin seen with supratherapeutic INR in the ED had been on antibiotics during the preceding four weeks. Patient with supratherapeutic INR given any antibiotic in the ED will be three time more likely to increase their INR value within 24 hours. Emergency physician should be very cautious prescribing antibiotics to patients in the ED with supratherapeutic INR.

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Deferred Emergency Department Care at a Community Hospital

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Introduction: Overcrowding is a major concern in emergency departments (ED) across the US. Overcrowding negatively affect ED experience by delaying medical care, decreasing patient satisfaction, and increasing staff frustration. Deferred care or diverting patients away from the ED has been proposed as a partial solution to easing overcrowding.

Objective: To evaluate the appropriateness and outcome of patients who were entered into a deferred cared program, the Health Access Program (HAP).

Methods: The HAP was active at an urban medical center from November 2007 to February 2009. Strict exclusion criteria were established. If no exclusion criteria were present, patients were referred by the triage nurse directly to the ED physician for a medical screening exam (MSE). If determined to be a safe candidate for HAP following MSE, patients were registered and directed to the Health Access Specialist (HAS), a social worker with specialized training in referral of patients to healthcare resources.

Results: During the study period, 153 patients were entered into HAP. Thirty-five were excluded because of inappropriate referral. Of 118 patients, 53 were male and 65 were female, mean age: 31.9 years. Thirty–six percent were self-pay and 64% had some form of third party payer. The average length of stay in the ED to completion of HAP referral was 111 minutes, at which time patients could opt to stay and be seen in the ED or go to the recommended referral site. After screening, those who elected to stay in the ED and be seen by the ED physician waited an average of 229 minutes; those who left to pursue care at the referral site waited an average of 63 minutes ($p<0.06$)

Conclusion: For deferred care programs to be useful in diverting patient flow from the ED, patients should not have to wait longer than 60 minutes for completion, screening and consultation.

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Fever and Bacteremia in the Critical Adult Sepsis Patient

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Introduction: Although clinical studies in children have shown that temperature elevation is an independent and significant predictor of bacteremia in children, the relationship in adults is largely unknown or equivocal.

Study Objectives: Review the incidence of positive blood cultures on critically ill adult septic patients presenting to an Emergency Department (ED) and determine the association of initial temperature with Bacteremia.

Methods: July 2008 to July 2010 retrospective chart review on all patients admitted from the ED to an urban community hospital with sepsis and subsequently expiring within 4 days of admission. Fever was defined as a temperature ≥38°C. SIRS criteria were defined as: 1) temperature ≥ 38°C or ≤ 36°C, 2) heart rate ≥ 90 beats/minute, 3) respiratory rate ≥ 20 or mechanical ventilation, 4) WBC ≥ 12,000/mm3 or < 4,000 or bands ≥ 10%. Data abstracted includes age, gender, chief complaint, admitting diagnosis, initial temperature, days to death, WBC, lactate, blood and urine culture results.

Results: 117 cases met inclusion/exclusion criteria. 99 (84.6%) had two or more SIRS criteria. Fever was present in 49 (41.9%) cases but 17 (14.5%) were hypothermic. There were 23 patients (19.7%) with positive blood cultures. Gram negative organisms grew in 16 (69.6%) patients, with Escherichia Coli and Streptococcus Pneumoniae being the most prevalent gram negative and gram positive bacteria. Patients with fever had 28.6% positive blood cultures versus 15.7% for euthermic patients and 5.9% for hypothermic patients. Only fever was found to be an independent predictor of a positive blood culture in this group of critical sepsis patients. The adjusted odd ratio was 2.86 (95% CI: 1.02, 8.04; P=.046).

Conclusion: In this study of critically ill adult septic patients, only fever was found to be a significant predictor for positive blood culture with an adjusted odd ratio of 2.86.

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Serum Lipase and Amylase in the Diagnosis of Acute Pancreatitis in Elderly Patients

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Introduction: The diagnosis of acute pancreatitis (AP) is challenging and increased morbidity and mortality have been seen with age and co-morbidities. Amylase and lipase levels three times normal are reported to have sensitivity and specificity of 100% and 95% in diagnosing acute AP. However, age-related structural and enzymatic changes are commonly seen with advanced age.

Study Objectives: This study investigates the sensitivity and specificity of serum amylase and lipase in the elderly population.

Methods: Twenty-two month retrospective chart review of patients 65 years and older with amylase and lipase drawn within 24 hours of Emergency Department (ED) visit and CT abdominal scans of the pancreas within 48 hours of visit. A patient was considered to have AP if the CT scan showed evidence of acute inflammation of the pancreas.

Results: There were 1266 patients 65 or older seen in the ED with serum lipase levels and CT abdominal scan. 47 patients (3.7%) had evidence of acute inflammation of the pancreas. Using a lipase value of three times normal, a sensitivity of 59.6% (95% CI: .455, .736) and specificity of 96.0% (95% CI: .949, .971) were calculated. Of note, 10/47 (21.3%) of the elderly patients with AP had normal lipase levels. Using an amylase value of three times normal, the sensitivity was 50.0% (95% CI: .337, .663) the specificity was 97.2% (95% CI: .962, .982).

Conclusion: The reported high sensitivity for lipase/amylase in diagnosis of acute pancreatitis does not hold true in patients 65 and older. Although the specificity remains high (96-97%), the sensitivity (50-60%) is so poor as to make the tests useless for ruling out the disease in the elderly.

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Disaster Preparedness: Does Having a Personal Family Plan For Hospital Employees Matter?

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Introduction: Hospitals are an integral part of disaster medicine and must be ready to handle large capacity surges on short notice. In the event of a disaster, hospital staffing plans ideally should address personal and family preparedness of responding personal.

Study Objectives: This study addresses the supposition that if employees do not have personal disaster plans in place, they will perceive greater challenges to report to work.

Methods: A retrospective analysis was performed on a pre-existing database containing the anonymous, voluntary survey responses of hospital personnel (N= 1302) at two urban Chicago hospitals. The survey asked a variety of questions concerning personal disaster preparedness.

Results: The results indicate that 26.5% of respondents have a personal disaster plan in place while 73.5% do not. Overall, employees without an emergency plan are significantly more challenged to report to work, based on transportation needs ($p<0.001$) with patient care technicians and support staff affected the most. Concerning the issue of dependent care (i.e. children, pets, and elders), having a family plan in place, regardless of job category, does not decrease the challenge both clinical and non-clinical staff would face in the event of a disaster ($p= 0.266$).

Conclusion: Encouraging hospital personnel to have a personal disaster plan in place may help ease the burdens that they would face in arriving and reporting to work in the event of an emergency. It would also allow hospital administrators to successfully plan for a disaster and maximize recruitment response.

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Clinical Characteristics of Pediatric Intussusception

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Objectives: Delay in the diagnosis and treatment of intussusception can be catastrophic. However, its clinical presentation can vary and it is often initially misdiagnosed as a less serious illness. Our goals were to identify the most common clinical characteristics of children ultimately diagnosed with intussusception and to identify what other diagnoses were considered during its evaluation.

Design: Charts of all patients less than eighteen years old with a discharge diagnosis of intussusception over a fifteen year period were reviewed. Analysis of the data provided information regarding the epidemiology, clinical characteristics, diagnostic and treatment modalities, as well as other admitting diagnoses of these patients.

Setting: An urban teaching hospital with approximately 50,000 visits annually.

Results: Forty-one cases were reviewed. The average age was 25 months with a male-to-female ratio of 1 to 1. The most common signs and symptoms were vomiting (85%), abdominal pain (68%), and bloody stool (54%). Less common findings included fever (39%), lethargy (36%), and decreased appetite (31%). Eleven patients (27%) presented with the classic triad of abdominal pain, vomiting, and bloody stool. Twenty-one patients (51%) had a plain abdominal radiograph with 76% of these read as abnormal. The most common abnormalities noted were dilated small bowel loops (48%), and small bowel obstruction (40%).

Conclusion: Most patients with intussusception presented with vomiting and approximately one-quarter presented with the classic triad of abdominal pain, vomiting, and bloody stool. Plain film abdominal x-rays were abnormal in the majority of cases.

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A Comparison of the Effects of Etomidate and Midazolam on the Duration of Pressor Use in Patients with Suspected Sepsis

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Study Objective: Etomidate is known to cause adrenal suppression after a single bolus dose, which has been suggested to cause increased vasopressor requirements. We analyzed an existing data set to determine if a single bolus dose of etomidate increased the duration of vasopressor requirements in patients with sepsis.

Methods: This was a secondary analysis of data obtained from patients enrolled in a double-blind, randomized study at our hospital. This study compared length of stay between patients with suspected sepsis who were intubated with either etomidate or midazolam in our emergency department over an 18-month period. For the current analysis, data on vasopressor duration were collected from medical records.

Results: A total of 122 patients were enrolled in the study; after randomization 59 received midazolam and 63 received etomidate. Of this 96 (80%) patients met sepsis criteria, and 59 (48%) patients required vasopressors. Patients receiving etomidate had a non-significant increase in likelihood of receiving pressors (OR 1.29, 95% CI 0.63 - 2.6). There was no statistically significant difference in mean hours on vasopressors for all patients 33.4 (95% CI 17 – 49) versus; 33.2 (95% CI 16 - 50 hours) or in the subset of patients with confirmed sepsis 39 (95% CI 19 - 58 hours) versus; 36 (95% CI 18- 55 hours) between patients who received etomidate and patients who received midazolam, respectively.

Conclusions: We found no significant difference in duration of vasopressor use between patients who were given etomidate and patients given midazolam in our study sample. These results do not support the contention that etomidate causes significant increases in vasopressor requirements.

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The 2009 Novel H1N1 Influenza Pandemic: Emergency Department Patient Knowledge and Behavior During a Recent Public Health Emergency

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Objectives: Dissemination of public health information is critical during public health events like the 2009 H1N1 pandemic. Many ED patients have no access to primary care and may have Limited English Proficiency (LEP). Our objectives were to assess ED patients for: access to information on H1N1, preferred method of information dissemination, current knowledge, and vaccination rates.

Methods: Two urban hospital EDs conducted surveys in 3 languages – English (ENG), Spanish (SPA), and Polish (POL). The survey was developed and piloted in December 2009; then, administered to consenting adult ED patients during a convenience sample of shifts between Feb-Sept 2010.

Results: Among 1129 participants, 681 (60.3%) spoke ENG, 413 (36.6%) SPA, and 35 (3.1%) POL. The major between-facility difference was in the proportion of patients with primary care; 84 (11%) at the public hospital and 137 (42%) at the private; $P < 0.001$. Nearly all 1086 (96.2%) had access to H1N1information. Patients had accessed a variety of sources: TV: 798 (70.7%); Medical Staff: 450 (39.9%); Internet: 370 (32.8%); and Work/Friends/School/Church: 723 (64.0%). There was no clear group preference for future information dissemination with Pamphlet, Broadcast Media and Medical Staff preferred by 39.7%, 38.7% and 37.9%, respectively. Current knowledge on H1N1 was good – 86.0% knew H1N1 symptoms; 81.8% when to seek care; 84.1% knew how to avoid contracting disease; and 86.2% knew how to avoid spreading disease. A total of 254 (22.5%) had received the H1N1 vaccine. This proportion was significantly higher for SPA speakers, 132 (32%); $P < 0.001$. Among the 757 with children, a total of 237 (31.3%) had their children vaccinated. SPA speakers had vaccinated their children significantly more frequently (94.1%), compared to ENG (48.7%) or POL (7.6%); $P < 0.001$. Among those who did not get vaccinated; 361(41.3%) felt they did not need it and 252 (28.8%) named side effects as the reason. An additional 472 (53.9%) did not know where to get vaccine or cited economic reasons.

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Conclusions: A majority of ED patients had accessed and retained accurate information on H1N1. However, vaccination rates were low and over half did not know where to get vaccine or thought they needed to pay, when local public health departments were delivering vaccine for free at multiple sites throughout the region. Our findings are limited by participation bias. We hope these data inform future public health campaigns.

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CT Abdomen/Pelvis Utilization (The CAT Study) — The Correlation with Number of Years in Practice as an Emergency Physician

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Introduction: Computed tomography (CT) has become one of the most important diagnostic modalities in the emergency department. There are many factors that influence the physician's decision to order a CT in the emergency room including: increasing availability, medicolegal concerns, improved diagnostic accuracy and patient request. This study evaluates whether there is a correlation between emergency physician years in practice and utilization of abdomen/pelvis (abd/pelvis) CT scans.

Study Objective: The objective of this study was to determine whether increased years of practice as an attending emergency physician decreases utilization of abdominal/pelvis computed tomography scans CT in the emergency department.

Methods: All abdomen/pelvis CT's ordered by attending emergency physicians in an urban academic hospital in Chicago from January 1, 2009-December 31, 2009 were tracked through the electronic medical record (Meditech). The physician's length of practice ranged from 0 - 34 years (n=14). Each physician was compared using number of years in practice versus number of abdominal CT's ordered.

Results: There is significant negative correlation between physician experience and rate of abd/pelvis CT request ($p=0.035$). The best linear fit to data indicates a downward trending slope of -0.089 (95% confidence interval [-0.17, -0.012]), representing the change in odds of ordering an abdomen/pelvis CT scan per extra year in practice as an attending emergency physician. The estimated magnitude of this effect is such that scans would be ordered in approximately 11.3% of cases by a novice attending physician, but only in 8.6% of cases by a physician with 30 years of experience.

Conclusion: There is an inverse relationship between number of years practiced as an EM physician and number of abd/pelvis CT scans ordered. However, the small sample size implies a relatively large uncertainty in the magnitude of the effect.

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Dollars and Sense in DKA

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Background: Diabetic ketoacidosis is a common complication in type 1 and 2 diabetics. Annually in the United States there are approximately 100,000 admissions at a cost of one billion dollars. Therapy is centered at treating DKA and identifying the etiology. A literature search resulted in accrediting 49% of DKA admissions in a primarily black urban hospital to non-compliance. We feel this grossly underestimates what the typical ER physician sees. We attempt to characterize the epidemiology of DKA in our community setting and postulate areas in the clinical setting to improve performance, save health care dollars, and improve patient outcomes.

Methods: A retrospective chart review study from January 2008 - June 2010 at St James Hospitals in Chicago Heights and Olympia Fields was completed. We included patients that were admitted with DKA as the primary diagnosis on admission. We excluded all patients with no prior history of diabetes, under age of 18, or were pregnant. Repeat admissions were not included. 200 patients met the above criteria.

Results: Overall median age was 44.8 years old, 43.5 in the noncompliant group, 38 in the improper insulin technique, and 54 in infection. Overall ratio was 53% female patients and 47% male patients, even distribution in the noncompliant group of 50% each, and 64% females in the improper insulin technique. Rate of noncompliance was 67%, insulin pump failure or improper utilization of insulin was 13%, infection was 14.5% and only 2.5% were related to ACS.

Conclusion: Non-compliance is an underestimated reason for the presentation of DKA in the ED; combined with improper technique and failure of mechanical insulin pump it accounts for 80%. Addressing noncompliance as the primary etiology would allow us to stream line the diagnosis of DKA and improve hospital performance, save health care dollars, and educate our patients improving their outcome.

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The Research College: Teaching Research Methods Through Experiential Team Learning

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Rationale: Education in research methodology, statistical analysis, and critical analysis of literature are specific requirements of the RRC. With the variability of residents' research backgrounds, interests, and motivations, universal achievement of these requirements is a challenge to programs. Many residents report feeling inadequately trained in research skills. We report the design and implementation of a unique, collaborative, experiential method to teaching research methods to residents.

Design: The Research College (RC) is one of 3 scholarly tracts of the Northwestern EM Residency, which meets monthly for 1h during conference time. We revised the RC syllabus for the 09/10 academic year to create an experiential curriculum in which all RC members participated in a group research project. We use David Kern's 6-step approach to development of medical curriculum to describe the design, with this abstract focusing on step 4: educational strategies. We identified core content and designed a linear curriculum of the clinical research process.

Methods: Kern's 4th step focuses on choice of curriculum content to achieve educational objectives. We divided the research process into distinct objectives, and covered one per monthly meeting (Table 1). We met in a classroom with group computers and STATA access to facilitate collaborative work. Between meetings, small groups had specific background, literature search, and writing assignments.

Results: At the conclusion of the year we had completed a year-long experiential curriculum, with IRB approval within 4 months of inception, abstract accepted for oral presentation at a national meeting within 8 months, and manuscript submission and acceptance within 12 months. 80% of RC members went on to conduct their own new research project, and 3 members now lead the RC using the developed process.

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Conclusion: A linear, experiential curriculum of the clinical research process with focus on collaborative learning is both a productive and sustainable means for teaching research methods to residents.

Table 1: Research Objectives
Developing the Research Question
Protocol Development
IRB Submission
Data Analysis, an Introduction to STATA
Abstract Writing
Endnote Tutorial
Scientific Writing: Drafting a Manuscript
Preparation for Presentation

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Ambulance Transports for Cardiac Complaints at the Chicago Marathon: Location of Calls and Comparison of Warm and Cold Years

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Background: Marathons put a great deal of strain on the human body, especially the cardiovascular system. Though uncommon, there is a very real risk of sudden cardiac death as seen in past marathons. With ever increasing participation by non-elite and potentially less than adequately trained athletes, being prepared for cardiac events is of great importance.

Objectives: To report the location of emergency medical system (EMS) calls for cardiac complaints, defined as chest pain (CP), syncope, and arrhythmia, along the course and to describe the rates of cardiac complaints in warm years (2008, 2010) compared to a cold year (2009).

Methods: Call center dispatch logs from the 2008-2010 Chicago Marathons were reviewed. Inclusion criteria were completed ambulance runs to either the main medical tent or a hospital with a documented problem in the EMS report of either CP, syncope, or a specific arrhythmia including bradycardia. Tachycardia not otherwise specified was not included.

Results: There were 33,033, 34,792, and 38,132 participants with average temperatures of 71, 37, and 71 °F in 2008, 2009, and 2010 respectively. EMS completed 511 runs, 40 of which met inclusion criteria: 13 CP, 24 syncope, and 3 arrhythmias [1 atrial fibrillation (AF), 1 supraventricular tachycardia (SVT), and 1 bradycardia]. Of the CP calls 12 came from the main medical tent and 1 from the finish area. Of the syncope calls 2 came between miles 9 and 11, 5 came between miles 16 and 20, 5 came between miles 23 and 26, 6 came from the finish area, 3 came from the main medical tent, and 3 had undocumented locations. Of the arrhythmia calls AF came from the 5^{th} mile, SVT came from in the 23^{rd} mile, and bradycardia came from the main medical tent. The warm years averaged 4 chest pain, 12 syncope, and 1.5 arrhythmia, whereas the cold year had 5 CP, and no syncope or arrhythmia (p=.0047 for syncope).

Conclusion: Over the studied years EMS calls for CP primarily occurred from the main medical tent. Syncope calls were most common after mile 16. There

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were more syncope calls and a trend towards more arrhythmia calls in warm weather as compared with cold. Cardiac equipment, such as cardiac monitors and automatic external defibrillators, is valuable throughout the race, though may be most utilized through the second half of the race as well as at the main medical tent and may be more widely used in warm weather.

2011 ICEP Spring SYMPOSIUM
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians

Can Nebulized Naloxone Be Used Safely and Effectively by Emergency Medical Services for Suspected Opiate Intoxication?

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Background: Emergency Medical Services (EMS) traditionally administer naloxone using a needle. Needle-less naloxone may be easier when IV access is difficult and may decrease occupational blood-borne exposure in this high-risk population. Recent studies have examined intranasal naloxone, but nebulized naloxone (NN) as an alternative needle-less route has not been examined in the pre-hospital setting.

Objective: We sought to determine if NN can be used safely and effectively by pre-hospital providers.

Methods: We performed a retrospective analysis of all consecutive cases administered NN between January 1 to June 30, 2010 by the Chicago Fire Department. All clinical data were prospectively entered in real time into a structured EMS database. Variables and outcomes were determined a priori and data abstraction was performed in a systematic manner. Included were cases of suspected opiate overdose, altered mental status, and respiratory depression; excluded were cases where NN was given for opiate-triggered asthma and cases with incomplete outcome data. The primary outcome was the response to NN. Secondary outcomes included need for rescue naloxone by any route or need for intubation. Kappa inter-rater reliability was calculated; study data were analyzed using descriptive statistics and Student T-test.

Results: Out of 128 cases, 105 met inclusion criteria. Of these, 23 (22%) had complete response, 62 (59%) had partial response, and 20 (19%) had no response. Only 10% needed rescue naloxone; no case needed intubation, no adverse events occurred. Response to NN was not associated with age, gender, time to patient, or initial GCS score. Response was associated with NN dose ($p=0.017$), time to treatment ($p=0.032$), and initial respiratory rate ($p=0.001$). Kappa score was (0.993).

Conclusion: Nebulized naloxone is a safe and effective needle-less alternative for pre-hospital treatment of suspected opiate intoxication, especially when given early, in a larger dose, and in patients with spontaneous respirations.

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Multi-Site Validation of An Ultrasound Image Rating Scale – A Pilot Study

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Background: Bedside ultrasound (BUS) is commonly performed to facilitate emergency department patient care, and is an integral component of the core curriculum for emergency medicine residency training. Currently, BUS competency is largely defined by number of exams completed. We hypothesize that quantifying BUS image quality is a better mechanism for quality assurance feedback and a more accurate indicator of trainee progress. To date there has been no widely accepted standard on measuring BUS image quality.

Objectives: To introduce and report preliminary testing of a 3-component, 8-point BUS rating scale (URS)

Methods: Gallbladder BUS was selected as the test case. Twenty deidentified BUS image sets (still images and clips) were forwarded electronically to 16 reviewers (13 attendings, 3 fellows) at 6 U.S. training sites, along with detailed instructions and examples for the URS. Each rated the BUS sets using the pilot URS. Training slides and sheets provided explanation, examples, and optimal anatomical landmarks for the URS. The URS rated "Landmarks (L)" from 1-5, "Image Quality (Q)" from 1-3, "Annotation (A)" from 1-2, for a "Total (T)" score range of 3-10. Raters also decided whether each BUS set would be "Clinically Useful" (yes or no) (U).

Results: Among 13 faculty raters, experience averaged 7.8 years and 60 images reviewed per week (range 2-15, 5-300). Among all 16 raters, the mean scores were 2.93 (L), 2.12 (Q), 1.62 (A), and 6.68 (T) respectively. Kendall's correlation coefficients were 0.55 (L), 0.57 (Q); 0.26 (A), 0.63 (T), and 0.45 (U). All URS elements correlated significantly with Clinical Usefulness ($P < 0.001$). The Spearman's correlation coefficients between the Clinical Usefulness and scoring elements were: 0.62 (L), 0.50 (Q), 0.40 (A), and 0.66 (T). The correlation coefficient between each reviewer and the entire group ranged from 0.31 to 0.69 and was higher with more years of experience.

Conclusion: These results suggest that development of a valid URS is feasible. The higher correlation for Landmarks and Total Scores may be an artifact of the wider scale

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ranges or the more explicit training for landmarks. Next steps: raising the scale ranges to remove difficulties with only 2-3 choices, expand URS training, and add organ systems. A future advance in URS development will be to use scans from individual BUS learners and correlate URS scores with a scan time series because learners should improve over time.

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In-Hospital Predictive Value of ED BNP Levels

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Objectives: Brain natriuretic peptide (BNP) has become a useful marker for the presence of congestive heart failure (CHF) in the ED. Previous studies have evaluated BNP as a marker of future myocardial dysfunction, mortality and readmission. Our goal was to determine the value of ED BNP levels in predicting in-hospital mortality, myocardial damage, and hospital length of stay (LOS).

Design: A retrospective chart review of all adult patients admitted through the ED over a 13 month period with a primary admitting diagnosis of CHF. Admission BNP levels, in-hospital mortality, myocardial damage (troponin elevation >0.1) and LOS were analyzed.

Setting: An urban teaching hospital with approximately 50,000 ED visits per year.

Results: The charts of 599 patients were reviewed. The in-hospital mortality of patients with BNP levels of <300 pg/ml, 300-900 pg/ml, and >900 pg/ml were 1.04%, 2.04%, and 3.3% respectively ($p < 0.14$). The percentage of patients sustaining myocardial damage in these three groups was 9.95%, 18.8%, and 42.4% respectively ($p < 0.001$). The average LOS of the patients in each group was 4.59, 5.56, and 5.41 days respectively. Further subanalysis of the data with regards to age and gender showed no differences in these groups.

Conclusions: The degree of BNP elevation in the ED was predictive of myocardial damage, but did not correlate with patients' LOS. While not statistically significant, patients with higher ED BNP values trended toward higher in-hospital mortality rates.

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The University of Chicago Teaching Resident Experience: A 360 Degree Evaluation from Faculty, Residents and Students

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Introduction: With rising patient volumes and wait times, it is important that an academic Emergency Departments formalizes the process by which high quality clinical education is ensured. Aside from clinical encounters and didactic sessions, complementary strategies such as simulation and mock oral boards have been developed that optimize learning. In 2006, the University of Chicago Emergency Medicine Residency defined a distinct resident role independent of primary clinical responsibilities dedicated to teaching. This role, titled the teaching resident (TR) has been fully integrated into the curriculum for the past three years and is well accepted by all stakeholders (faculty, residents and medical students) per anecdotal experience. Similar programs have been documented in literature, but with no mention of the educational value.[1] Literature demonstrates positive value in resident-as-teachers curriculum in medical education, but not specifically emergency medicine.[2, 3] Our goal was to measure the impact of the TR position upon the ED and the corresponding learning environment.

Methods: A survey instrument was constructed and distributed to all current faculty members, residents and medical students rotating through the emergency department. Respondents ranked their perception of patient flow, ease of procedures, and medical student learning with and without the presence of the TR on a Likert scale. Other metrics evaluated were continuity of care, quality of patient care, and overall learning with the addition of the TR. In addition, the value to the ED and overall satisfaction of the TR role were also ranked. Results were compiled and analyzed using Excel.

Results: The residents perceived that the TR had a statistically significant impact ($p<0.05$) in patient flow, procedure performance and medical student learning. Additionally, TR presence trended positively for perceived improvements in continuity in care, clinical care, value as an educational tool and overall satisfaction with the position (*Table 1 and 2*). These trends were demonstrated in the data provided by faculty and medical student surveys of the teaching resident position (*Table 5, 6*). The faculty perception mirrored the residents as there was a perceived statistically significant impact in patient flow, procedure performance and medical student learning (Table 3). Further, the medical students believed that learning and ease of procedures were improved ($p<0.05$) with the presence of the TR (Table 4). All other survey results are demonstrated in the following tables.

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Conclusion: The TR role provides an important adjunct learning tool for junior level residents and medical students. Survey data supports the anecdotal finding that the residency and learners values the TR presence. Various stakeholders' perceptions of patient flow, procedure performance, and medical student teaching were all improved with the presence of the TR. In addition, the other variables studies were perceived positively. Ours lends supporting evidence to existing literature that residents-as-teachers programs demonstrate positive impact. Further work will need to be done to formalize a strict resident-as-teachers curriculum as suggested by SAEM Undergraduate Education Committee.[4]

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Table 1 - Resident Perception of Parameters With and Without the Teaching Resident

	TR Present	TR Absent	P-Value
Patient Flow	3	2.27	<0.001
Procedure Performance	4.3	2.78	<0.001
Medical Student Learning	4.25	2.88	<0.001

Table 2 - Resident Perception of Teaching Resident Impact

	Mean	Standard Deviations
Continuity of Care	3.77	0.42
Clinical Care	4.08	0.37
Resident Learning	4.29	0.33
Value as Educational Tool	4	0.38
Overall Satisfaction	4.13	0.34

Table 3 - Faculty Perception of Parameters With and Without the Teaching Resident

	TR Present	TR Absent	P-Value
Patient Flow	3.125	2.5	<0.01
Resident Learning	4.375	3.375	<0.001
Medical Student Learning	4.25	2.88	<0.0001

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Table 4 - Faculty Perception of Teaching Resident Impact

	Mean	Standard Deviations
Continuity of Care	3.375	0.42
Patient Care	4.125	0.6
Ease of Procedures	5	0
Value as an Educational Tool	4.125	0.38

Table 5 - Medical Student Perception of Parameters With and Without the Teaching Resident

	TR Present	TR Absent	P-Value
Learning	3.93	3.35	<0.05
Procedure Ease	4.33	2.23	<0.05
Amount of Procedures	2.76	3.02	0.22

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Table 6 - Medical Student Perception of Teaching Resident Impact

	Mean	Standard Deviations
Overall Experience	4.05	1.06
Value as an Educational Tool	4.26	0.99
Meeting Needs of Future Specialty	3.37	1.19