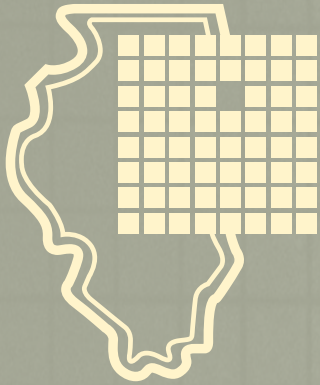


ILLINOIS COLLEGE OF EMERGENCY PHYSICIANS



2010 ICEP

Spring SYMPOSIUM & ANNUAL BUSINESS MEETING



Research Abstracts



STATEWIDE RESEARCH SHOWCASE

Thursday, April 29, 2010

Northwestern Memorial Hospital ■ Chicago, Illinois

PRESENTED BY ILLINOIS COLLEGE OF EMERGENCY PHYSICIANS



2010 ABSTRACTS TABLE OF CONTENTS

Statewide Research Showcase

Relationships Between Symptomatic Dyspnea and Renal Function in Patients with Acute Heart Failure Syndromes: Results from URGENT (Ularitide Global Evaluation in Acute Decompensated Health Failure)

Angioedema Resulting from ACE Inhibitors in an Urban Community Hospital

Effect Assessment of a Dietary Supplement for Male Enhancement on Electrocardiographic Parameters

Psychiatric Transfers from the ED: Factors Associated with Length of Stay

Etomidate for Procedural Sedation: A Retrospective Comparison Between Age Groups

Rashes in the Emergency Department: Descriptive Abilities of Emergency Physicians

Pediatric Trauma Transfers from a Community Emergency Department

Does A Comprehensive Disaster Preparedness Training Course Improve Emergency Physicians Preparedness for All-Hazard Events? A One Year Analysis

Survey of Antibiotic Prescription Filling Time After ED Discharge

Implementation of a Knowledge Translation Shift for Senior Emergency Medicine Residents

Senior Teaching Resident Impact on Emergency Medicine

An Analysis of Staffing Inefficiencies and the Effects on ED Patient Flow and Waiting Room Volume

Crowding Does Not Adversely Affect Time to Antibiotics in Septic Patients Treated with EGDT

A Longitudinal Analysis of Racial Bias Trends During Emergency Medicine Residency Training

Management of Pediatric Skin Abscesses in Springfield, Illinois: A Retrospective Study

Clinical Indicators of Meningitis in a Cohort of Patients with High Clinical Suspicion: A Retrospective Study

Tracking EKGs from the Emergency Department to the Floors

Patient Satisfaction in Emergency Department Patients with Abdominal Pain – The Effect of Routine Bedside Ultrasound on Patient Satisfaction in the ED

Palliative Care Symptom Assessment in the Emergency Department: Validation of the Screening for Palliative Care Needs in the ED (SPEED) Instrument

Barriers to Obtaining a Point-of-Care Glucose in Emergency Department Triage

Needs Analysis of Emergency Medicine Residents in Informed Consent Utilizing a Hybrid Simulation and Written Exam

Pregnancy and Maternal Trauma: Predictors of High Risk Behaviors and Assault

Increase in Non-Contrast Computerized Tomography Scans of the Head Following Popular Media Stories About Head Injuries

Educational Value of Helicopter Emergency Medical Services (HEMS) in EM Residency Training

The Effect of a Regional STEMI Transfer Protocol on Improving the Time to Primary Percutaneous Angioplasty



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STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Relationship Between Symptomatic Dyspnea and Renal Function in Patients with Acute Heart Failure Syndromes: Results From URGENT

(Ularitide Global Evaluation in Acute Decompensated Heart Failure)

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Background: Dyspnea is the most common complaint in ED patients with acute heart failure syndromes (AHFS). AHFS patients with baseline renal impairment may be more difficult to treat and have worse outcomes. The association between renal function and dyspnea improvement has not been well characterized. We hypothesized that ED patients with AHFS and baseline renal dysfunction would have more refractory dyspnea after standard ED therapy.

Methods: Sub-analysis of the URGENT Dyspnea study; this international, multi-center prospective cohort study quantified dyspnea with an 11-point VAS at time 0 & 6h later. Glomerular filtration rate (GFR) estimated using Modification of Diet in Renal Disease equation; patients categorized as normal (GFR>60) and impaired function (GFR<60). Main outcome VAS change ≥ 3 defined clinically significant reduction in dyspnea. Differences in proportions were analyzed using 95% CIs. Difference between mean GFR among those with/without significant dyspnea reduction was analyzed with Student's t-test.

Results: 524 patients had AHFS; 21 excluded for absence of creatinine. Mean age was 67.8 years and 56.7% were male. Mean GFR was 58.0 mL/min (range 3.7 to 188.6). Mean change in dyspnea score was improvement by 2.3 points (range 10 to -4). When comparing the proportion with dyspnea improvement in the normal GFR group (37.8%) with the reduced GFR group (41%) there was no significant difference (95% CI for difference -11.8 to 5.3%). There was no significant difference in mean GFR when comparing patients with dyspnea improvement vs. no significant improvement, (56.8 vs. 58.7; 95% CI for difference -2.9 to 6.5).

Conclusion: In this sample of ED patients with AHFS and objective measurement of dyspnea, there was no significant difference in dyspnea improvement between patients with reduced vs. normal baseline renal function. Approximately 40% of patients regardless of renal function reported quantifiably significant reduction in dyspnea.



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STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Angioedema Resulting from ACE Inhibitors in an Urban Community Hospital

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Introduction: Swelling of the lips, tongue, and pharynx, also known as angioedema, can make airway management a nightmare for emergency physicians. Angioedema is a known adverse event of taking ACE-I's (angiotension converting enzyme inhibitors) Most commonly, this swelling is seen with the tongue, lips, face, and throat and so ACE-I induced angioedema is a potentially life threatening complication.

Study Objectives: The purpose of this study is to comment on the management and complications of ACE induced angioedema in the community setting.

Methods: Five year retrospective chart reviews of all cases of angioedema associated with ACE inhibitor use presenting to an urban ED. Data abstracted includes prior history, symptom onset, ED treatments, responses, complications, hospitalizations and length-of-stay (LOS).

Results: There were 24 cases, 66.7% male, mean age of 66.0 (SD:12.7). Median time of symptom onset was 2.5 hours (range: 1 to 92) and 87.5% were admitted to the hospital with an average LOS of 2.6 days (range 1 to 7). All patients received steroids in the ED while 9/24 (37.5%) received epinephrine in the ED without noticeable improvement. One patient required emergent intubation in the OR. There were no mortalities.

Conclusion: In this small retrospective study, the majority of patients were hospitalized but only one required any additional emergent intervention.



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STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Effect Assessment of a Dietary Supplement for Male Enhancement on Electrocardiographic Parameters

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Context: Enzyte is a multicomponent dietary supplement marketed to consumers for male enhancement. Male enhancement is a euphemism for erectile dysfunction. Given the lack of safety data with this preparation, additional data is desperately needed.

Objective: To determine the effect of Enzyte, a multicomponent dietary supplement marketed for sexual dysfunction, on electrocardiographic parameters.

Methods: The study was a randomized, double blind, double-dummy, placebo controlled, dose-ranging cross over trial design approved by the Institutional Review Board at Midwestern University.

Main Outcome Measures: The primary endpoints of this study were the effect of Enzyte on the mean maximal heart rate corrected QT interval following ingestion. The QT interval was corrected for heart rate using the Bazett Correction Formula and the Framingham Linear Corrected Correction Formula.

Results: Fifty male subjects were considered for study enrollment, with nine subjects (2 Asian, 7 Caucasian; mean age of 28.7 ± 11.3 years mean body mass index of 26.8 ± 4.4) entering the trial. The mean QTc (Bazett) at baseline was 392 ± 31 msec. Following ingestion of the manufacturer recommended dose, the QTc (Bazett) was prolonged by 34, 32, and 37 milliseconds compared to placebo at one, three, and five hours post-dosing, respectively ($p < 0.001$). Data were similar when the Framingham Linear Correction Formula was applied. Four (44.4%) of subjects developed niacin-induced cutaneous flushing. No other adverse effects were reported.

Conclusions: Enzyte, a multicomponent dietary supplement marketed for erectile dysfunction, increases the QT/QTc interval and suggests an increased risk of drug induced pro-arrhythmia. The product should not be used by patients until more information is available.



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STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Psychiatric Transfers from the ED: Factors Associated with Length of Stay

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Center Emergency Medicine Residency Program, Chicago**

Introduction: Psychiatric complaints remain a common Emergency Department (ED) problem. Transfer of these patients from ED's without inpatient psychiatric capability continues to occupy significant resources. In this study, we sought to investigate factors associated with ED length of stay (LOS) of psychiatric transfers.

Materials/Methods: We performed a retrospective review of all psychiatric transfers from two urban academic ED's over a four month period. Such data as age, gender, insurance type, lab studies, vital signs, and prior medical history was examined. A univariate and multivariate analysis of mean LOS concerning these factors was performed. Statistical significance was set at 0.05.

Results: Ninety-two patients were reviewed. The mean LOS for all patients was 562 minutes. The mean number of labs performed was 5.0, with only 1.1 being abnormal. 37% had an ancillary study (EKG/CT/x-ray) performed. Only two ancillary studies had abnormalities, and neither was clinically relevant. The performance of any ancillary study added an additional 63 minutes to LOS. 43% were provided an ED medication for their condition. On univariate and multivariate analysis, such factors as insurance status ($p < .001$), day of the week ($p = .012$), abnormal lab values ($p = .044$), and ancillary studies performed (.043), all affected LOS.

Conclusion: Numerous factors appear to affect ED LOS for psychiatric transfers. In particular, insurance status, the day of the week, abnormal lab data, and ancillary studies performed, all affected mean LOS. This study demonstrated that for each ancillary test performed an additional 63 minutes was added to the LOS.



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STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Etomidate for Procedural Sedation in the Elderly: A Retrospective Comparison Between Age Groups

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Background: Etomidate for procedural sedation has become a common drug among emergency physicians because of its relatively safe side effect profile. It has been used in all age groups with success. Although used in the elderly, there has been little study of its effects on this particular age population.

Objective: To compare the complication rate and length of stay (LOS) between the elderly (ages 65 and older) and the adult (ages 18-64) populations when etomidate is used for procedural sedation. Specifically, to determine if using etomidate in the elderly population leads to more side effects and a longer length of stay.

Methods: A retrospective analysis was performed over a four-year period in an urban setting teaching hospital with approximately 55,000 ED visits annually. Electronic medical records selected all patients who received etomidate in the emergency department from June 2004 to June 2008. Patients younger than age 18 and those who were intubated were excluded. To account for correlated errors, only first time visits to the emergency department were used. The chi-square and analysis of variance tests were used for statistical analysis. IRB approval was obtained from both Swedish Covenant Hospital and Northwestern University.

Results: There were 45 elderly and 149 adult patients for a total of 194. Overall, there were 31 (16%) patients who experienced a complication: nine (20%) elderly patients compared to 22 (14.8%) adult patients. Despite the increased complication rate, no significant difference existed between the age groups and side effects. The elderly mean LOS was 225 minutes compared to the adult mean LOS of 205 minutes, with an overall LOS of 210 minutes. There was no overall significant difference between age groups and side effects when compared to LOS. Among patients who experienced a complication, mean LOS was 267 minutes: 252 minutes in the elderly age group and 273 minutes in the adult. Among patients who did not experience a complication, the mean LOS in the elderly and adult age groups were 219 minutes and 193 minutes, respectively, with an overall LOS of 199 minutes. There was shown to be a statistical significance ($p \leq .05$) between side effect and LOS. On average, patients who experienced a complication remained in the ED for 68 more minutes.



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STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Conclusion: Etomidate remains as safe and effective an alternative for procedural sedation in the elderly as it is in the general aged population. If a complication does occur, it is most likely to be transient and resolve in a short time period. It does, however, increase the length of stay for the patient in the emergency department.



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Rashes in the Emergency Department: Descriptive Abilities of Emergency Physicians

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Center, Emergency Medicine Residency Program, Chicago**

Introduction: Dermatological complaints comprise between 4 to 12% of Emergency Department visits each year. Although rare, a few conditions can be potentially life threatening and associated with a high morbidity and mortality. Emergency Medicine (EM) physicians have limited training in identification and description of various dermatological conditions.

Study Objectives: This research study is designed to assess the ability of Emergency Medicine resident and attending physicians to describe various rashes and compare with descriptions provided by practicing Dermatology physicians.

Methods: A selection of 15 photos of rashes was sent to 3 practicing Dermatologists. 10 photos were described by the three Dermatologists with unanimous key words and selected to use on EM physicians. These 10 photos were distributed to EM residents and attending from three Emergency Medicine Residency programs and descriptions recorded for each photo. The total number of key words matching the dermatologists' unanimous list of key word was scored and comparison between training level and mean scores performed using descriptive statistics.

Results: 74 EM physicians (63 residents and 11 attending) volunteered for the study. The three Dermatologists unanimously described 21 key words for the ten rashes selected for the study. The median number of key words identified by EM physician concordant with Dermatologists was only 5.0 and no EM physician scored more than 10 concordant key words. Box plot analysis of mean scores did not show any difference between year of EM training, amount of dermatology training or comfort level in describing rashes.

Conclusion: There is poor concordance between rash description provided by EM physicians and practicing Dermatologists. Efforts should be made to educate EM physicians on the terms and descriptions Dermatologists actually use in their practice to improve communication between the specialists.



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Illinois College of Emergency Physicians ■

Pediatric Trauma Transfers from a Community Emergency Department

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Center Emergency Medicine Residency Program, Chicago**

Introduction: Many pediatric trauma cases are best treated at a designated trauma or burn center. When these cases present to a community Emergency Department (ED), these patients are evaluated, stabilized, and transported to the closest trauma/burn facility.

Study Objectives: The objective of the study is to verify our hypothesis that pediatric transfers from a community ED are mostly for trauma and involve only certain subspecialties.

Methods: Retrospective chart review of all pediatric patients seen in the ED from January, 2006 to August, 2009 and subsequently transferred from the ED to a higher level facility. Data abstracted included age, gender, arrival type, chief complaint, ED diagnosis, length of stay (LOS), and disposition. Descriptive statistics were calculated and analyzed.

Results: There were 32 patients reviewed with median age of 4.5 years (SD: 5.2) and 50% male. All of the transfer cases were trauma with 44% head trauma, 25% extremity trauma, and 22% burns. 34.4% (11/32) arrived by EMS while 65.6% (21/32) were walk-in triage. There were 14 CT head scans, one brain MRI, four CT cervical spine scans, two spinal MRI, and one CT abdominal scan performed in the ED. Two burn patients required intubation prior to transport. The mean LOS in the ED was 233 minutes (SD: 120) while the mean wait time for EMS to arrive in the ED for transfer was 93 minutes (SD: 46).

Conclusion: In this small study, patients transferred required evaluation and stabilization but 40% of their ED length of stay was spent waiting for transport to a trauma or burn center.



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Illinois College of Emergency Physicians ■

Does a Comprehensive Disaster Preparedness Training Course Improve Emergency Physicians Preparedness for All-Hazard Events? A One-Year Analysis

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Background: Disaster preparedness has become an essential area of clinical competence for emergency medicine physicians, especially with increased awareness of the sequelae of natural disasters and the emergence of biologic, chemical, and nuclear threats. Recognition of a situation with the potential to meet disaster criterion, organization to mitigate consequences, management of a disaster, and treatment of disaster associated injuries are part of an overall body of knowledge required of emergency physicians. There are currently no studies evaluating long-term educational intervention effectiveness for disaster preparedness among emergency physicians or any other specialty.

Objective: The main objective of this study was to measure the impact of a comprehensive training course on the level of disaster preparedness for mass casualty events among attending emergency physicians in an urban tertiary care center.

Methods: The study took place at an urban tertiary care facility from July 2007 until June 2008. Fourteen attending emergency physicians participated in a multi-modality curriculum training covering core disaster preparedness and management. The teaching modalities included didactic lectures, merit-badge courses, hands-on training, and a hospital wide disaster drill. A self-evaluation questionnaire and a written test were administered to the participants before and after the training. Statistical analysis was then performed using non-parametric analysis.

Results: Statistically significant improvement in self-reported preparedness in all the areas of training was noted. Out of 5 maximum possible points, the mean score for self-reported overall personal preparedness post-training was significantly higher than pre-training (3.9 ± 0.56 vs. 2.7 ± 0.82 , $p=0.01$). In addition, there was a statistically significant overall improvement in the post-test vs. pre-test scores for the group (44.4 vs. 29.8, $p<0.005$). Specifically, improvement was most noted in the following categories of training: general disaster concepts (12.7 vs. 8.2, $p=0.008$), blast (7.6 vs. 4.6, $p=0.006$), radiological (shouldn't this be nuclear instead of radiological? (6.4 vs. 2.4, $p=0.005$) and chemical injuries (7.7 vs. 6.0, $p=0.02$).

Conclusion: A comprehensive year long multi-modality training program improves the long-term disaster preparedness among emergency physicians.



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Illinois College of Emergency Physicians ■

Survey of Antibiotic Prescription Filling Time after ED Discharge

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in Chicago; Mercy Hospital and Medical Center, Chicago**

Objectives: With over 10 million antibiotics prescribed from the ED annually in the United States, it would be helpful for ED physicians to know how quickly their patients are able to get such time sensitive medications. Our goal was to determine both the rate of antibiotic prescription filling and the time it took to do so in patients discharged from the ED. We also attempted to determine reasons for any delay in filling the prescriptions.

Design: A convenience sample of adult and pediatric patients discharged with antibiotic prescriptions from the ED were contacted by telephone on the third day after discharge. Patients were questioned about their ability to fill the prescription, as well as the time it took after ED discharge to obtain the antibiotic and any causes for delay in this process.

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

Results: Seventy-seven patients were contacted, of which 28[36.4%] were children. Fifty-five [71.4%] were African American. UTI [20.8%], pharyngitis [10.4%], and otitis media [10.4%] were the top three discharge diagnoses. Macrolides [28.6%], penicillins [27.3%], and flouroquinolones [14.3%] were the main antibiotics prescribed. Thirteen of the 77 patients [16.9%] received a dose of an antibiotic in the ED prior to discharge. Seventy-one patients [92.2%] filled their prescription with an average filling time of 6.96 hours. Over half of the patients filled the prescription within 2 hours of being discharged. Five of the six who did not fill their prescription cited monetary reasons. Twenty-eight [39.4%] of the 71 patients who filled their prescription took greater than 6 hours to do so, with most citing a lack of a sense of urgency or pharmacy related delays as the main cause. Those patients given a dose prior to discharge took on average 9.62 hours to fill their prescription compared to 6.36 hours in those patients not given a dose in the ED [p=0.17]. Children had their prescriptions filled significantly faster than adults [4.70 hours vs. 8.34 hours, p=0.05].

Conclusions: A significant majority of patients discharged from our ED filled their antibiotic prescriptions, most within 6 hours of discharge. Pharmacy issues and lack of a sense of urgency were the main causes of delay. Those not filling their antibiotics cited monetary issues as the main deterrent. Physicians should address the ability to make it to a pharmacy, the need for the antibiotic, and money concerns when discharging patients with antibiotics from the ED. In addition, children had their prescriptions filled significantly quicker than adults.



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Illinois College of Emergency Physicians ■

Implementation of a Knowledge Translation Shift for Emergency Medicine Senior Residents (EMRs)

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Background: Principles of evidence-based medicine (EBM) are inconsistently translated to clinical practice due to lack of experience, training, and time.

Objective: Implement a novel experiential learning innovation for senior EMRs to translate EBM into clinical practice and teach EBM to colleagues in real-time clinical care.

Methods: *Study design:* Prospective observational cohort study. *Setting:* PGY1-4 EM residency at an urban academic center. *Inclusion criteria:* Consenting PGY3-4 EMRs. *Study protocol:* A pre-test online survey queried all senior EMRs prior to their first knowledge translation (KT) shift to assess baseline EBM knowledge. Each month, 1 KT shift was scheduled per EMR during peak hours. The first shift started with a 1-hr resident review of 2 online EBM tutorials from available websites. Each subsequent shift, the KT EMR followed ED patients, generated clinical questions, performed systematic literature reviews, presented real-time results to the primary team, and documented findings in the medical record. Clinical scenarios and search findings were archived in an anonymous database. At the end of each shift, EMRs completed an evaluation, documented any changes in patients' disposition or diagnostic tests, and rated how the KT shift changed their EBM skills on a 5-point Likert scale (1-greatly impeded, 2-somewhat impeded, 3-no change, 4-somewhat improved, 5-greatly improved). Proportions and 95% CIs are reported.

Results: 48/50 residents (96%) consented to participate. 80 total patient encounters were studied. KT EMRs did an average of 2.2 cases/3 hr shift, citing 3 articles/shift. Literature reviews took an average of 37 min. EMRs felt the shift somewhat improved their skills for practicing EBM (3.68/5). 21/80 patients (26.2%) had a change in care due to involvement of the KT EMR.

Conclusions: A KT shift for senior EMRs may improve skills for practicing EBM. EMRs can review several cases per shift, periodically resulting in real-time changes in medical decision-making.



Senior Teaching Resident Impact on the Emergency Medicine Resident Learning

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David S. Howes, MD, FACEP; **University of Chicago**

Study Objective: In a busy academic Emergency Departments it is important to formalize 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. However, less evidence is available describing strategies that improve the effectiveness of residents as teachers. 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 both faculty and residents per anecdotal experience. Our goal was to measure the impact of the TR position upon the ED and resident learning.

Methods: A survey instrument was constructed and distributed to all 48 current residents. Residents 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. Residents also evaluated continuity of care, quality of patient care, and overall resident 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 Stata v.10.

Results: 77.1% (37/48) of individuals completed the survey. A statistically significant difference ($p < 0.001$) favoring the presence of the TR was observed for patient flow, ease of procedures, and medical student learning. The results of the other resident perceptions are summarized in the table below.

	Mean	95 % Confidence Interval	
Continuity of Care	3.77	3.356642	4.198914
Clinical Care	4.08	3.718245	4.448421
Resident Learning	4.29	3.974565	4.62003
Value to the ED	4	3.618208	4.381792
Overall Satisfaction	4.13	3.803911	4.473867

	TR Present	TR Absent	p
Patient Flow	3	2.27	<0.001
Procedure Performance	4.3	2.78	<0.001
Medical Student Teaching	4.25	2.88	<0.001



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Illinois College of Emergency Physicians ■

Conclusion: The TR role provides an important educational tool for both the teaching resident and the emergency medicine team as a whole. Survey data supports the anecdotal finding that the residency values the TR presence. Resident perception 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. Further work will be needed to determine how best to deploy residents as teachers.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

An Analysis of Staffing Inefficiencies and the Effects on ED Patient Flow and Waiting Room Volume

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Objectives: Suboptimal emergency department (ED) efficiency may affect patient wait times, throughput, and length-of-stay (LOS) with adverse impacts on patient care outcomes and left without being seen (LWOBS) rates. We sought to identify opportunities to improve ED efficiency through improved staffing, and subsequently measure the effect of an implemented staffing change.

Methods: We performed a before-and-after analysis using data from existing staffing schedules over January to June of 2009. To identify deviations from optimal staffing levels, we calculated hourly resource allocation by staff (attending, RN, technician) and compared this to arrivals and LWOBS rates. We then analyzed these variables after the implementation of an additional attending shift placed at the theoretical optimal time (11am) by comparing (i) throughput parameters before-and-after implementation, and (ii) the cost of implementation with the financial impact of our LWOBS rate.

Results: Average daily arrivals varied by day of the week (average 255; range 246 to 280). Average hourly arrivals ranged from 2.2 to 14.4, with distinct trends by patient type (EMS, adult walk-in, trauma, or pediatric). Average hourly arrival rate per MD was 2.45 with significant variation, but fairly consistent daily trend, ranging from 1.23 to 3.71. There was a similar magnitude of variation among ratios for nurses (0.54; 0.25-0.73) and technicians (1.47; 0.77-2.08). The LWOBS hourly rate was 6.3% (0.7% - 12.6%) with a pattern reflecting both arrivals and staffing ratios. After the staffing change, a 9% reduction in waiting-room backup and 5% reduction in LOS was seen despite an 8% increased monthly volume, with effects extending into the early morning hours, but the LWOBS rate persisted. The opportunity cost of LWOBS patients in our ED was estimated at \$1.3 million annually, suggesting incentive for additional changes.

Conclusions: Our analysis suggests significant inefficiencies exist, with multiple areas for patient flow improvement. Implementation of an additional shift placed at the theoretical optimal time to address inefficiencies resulted in slightly improved waiting room volume and patient LOS without affecting the LWOBS rate. Cost analysis suggests opportunity for additional modifications.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Crowding Does Not Adversely Affect Time to Antibiotics in Septic Patients Treated with EGDT

**Abigail Balger, MD; Kathleen Rzechula, RN; Christine Kulstad, MD, FACEP;
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Objectives: Multiple studies have determined that emergency department (ED) crowding is associated with adverse effects on patient care. In the most severely ill patients, however, crowding may have less of an effect as increased resources are mobilized for that patient. We sought to determine whether crowding, measured by ED occupancy rate on arrival, would correlate positively with increasing time to administration of antibiotics in septic patients treated with early goal directed therapy (EGDT).

Methods: We performed a prospective observational study in our large community hospital ED from May 2007 to November 2007. Patients were included if they met the criteria for severe sepsis or septic shock. The ED occupancy rate on arrival (number of patients in the ED divided by the number of licensed beds [50]) and the time of antibiotic administration (as recorded in the electronic medical record) were recorded. We then used Spearman's correlation to determine the degree of correlation between these variables.

Results: A total of 215 patients were treated with EGDT during our study period. The mean occupancy rate at arrival was 106% (range: 26% to 196%) with the mean time to administration of antibiotics of 193 minutes (range: 2 to 1376 minutes). No significant correlation between occupancy rate and time to administration of antibiotics was evident (Spearman's ρ : .12, $p=.07$).

Conclusion: The time to administration of antibiotics in septic patients treated with EGDT was not significantly correlated with ED crowding, as measured by occupancy rate. Established protocols for the treatment of these critically ill patients may buffer some of the negative effects of crowding, while perhaps shifting resources away from the less severely ill.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

A Longitudinal Analysis of Racial Bias Trends During Emergency Medicine Residency Training

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Objectives: Evidence continues to accumulate demonstrating that physician racial bias impacts patient care. Validated instruments exist to measure implicit/unconscious racial bias (Race Implicit Association Test, Race IAT) and explicit/conscious racial bias (Modern Racism Scale, MRS). We sought to extend a prior analysis of temporal trends in racial bias during emergency medicine (EM) residency training, hypothesizing that bias increases over time.

Methods: We prospectively surveyed current residents and the most recent graduating class of our EM program (suburban level I trauma center) in the fall of 2007, 2008, and 2009 using the Race IAT and MRS. Participants anonymously recorded results for the Race IAT (divided into 7 categories ranging from a “strong preference for blacks” to a “strong preference for whites”) and the MRS scores (which range from -14, a low level of bias against blacks, to +14, a high level of bias). Using paired samples t-testing, we measured participants’ changes in response over the three-year period. We also determined if any correlation existed between implicit and explicit bias.

Results: 71 of 132 surveys (54%) were completed. Of the 66 potential subjects, 2 were underrepresented minority physicians. Overall, explicit bias scores for first time responders were low (mean -7.6, SD 2.94), but implicit bias results revealed that 22 of 35 first time responders (63%) displayed a moderate or strong preference for whites. Nineteen candidates completed the surveys at least twice; mean explicit bias scores increased by 0.89 units (a 3.2% increase, $P=0.017$). Mean implicit bias scores increased by 0.63 units (a 9% increase, $P=0.83$). Nine candidates completed the surveys three times; mean explicit bias scores increased by 0.78 units (a 2.8% increase, $P=0.36$), while mean implicit scores increased by 0.11 units (a 1.6% increase, $P=0.84$). Implicit and explicit bias scores did not correlate ($r = -0.017$, $P=0.89$).

Conclusions: 63% of residents and recent graduates from our EM program may exhibit at least a moderate degree of implicit racial bias in favor of whites over blacks, exceeding the rate (54%) in general respondents to the Race IAT. Explicit bias appears to worsen during residency training in our study sample. There is also a trend towards increasing implicit bias over time. There was no significant correlation between subjects’ explicit and implicit racial bias scores.



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STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Management of Pediatric Skin Abscesses in Springfield, Illinois

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Background: There has been a significant increase in skin abscesses seen in the emergency department (ED) across the nation. The increase has been attributed to community acquired methicillin resistant *Staphylococcus aureus* (CA-MRSA). Incision and drainage (I&D) is required in the management of these skin abscesses. The recommendations for antibiotics vary and are dependent on the pathogen's antibiotic sensitivity, which has geographical variation. Determining the pathogen for skin abscesses and the antibiotic sensitivity pattern in our region may help guide more appropriate antibiotic usage.

Hypothesis: Skin abscesses in the pediatric population are a common occurrence in Springfield Illinois. The primary pathogen for skin abscesses in this region is CA-MRSA with high sensitivity to trimethoprim-sulfamethoxazole (TS) and clindamycin.

Methods: This is a retrospective study. Using ICD-9 code for cellulitis and abscesses, 807 charts of pediatric patients (< 19 years of age) from St John's Hospital, Springfield Illinois, in 2007 and 2008 were identified and reviewed. Excluded were patients with chronic illnesses, frequent hospitalizations, or on immunosuppressive agents. Information collected included age, gender, race, past or family history of skin abscesses, management of the skin abscesses, including antibiotic used, culture results and antibiotic sensitivity. The location of the patients' initial healthcare encounter for this condition was also noted.

Results: 807 patients were identified with skin and soft tissue infections in 2007 (n=376) and 2008 (n=431). The patients presenting with skin abscesses were Caucasian (58%) females (54%) with a mean age of 6 years. Only 38% of the patients with skin abscesses in our community were African American. 19% of the patients had a history of skin abscesses and only 5% had a family history of skin abscesses. These lesions tended to occur in the buttock region (29%) followed by the lower leg (10%), thighs (9%) and abdomen (9%).

The primary pathogen for the skin abscesses seen in the ED, was CA-MRSA (64% in 2007 and 61% in 2008) with 96% and 98% clindamycin sensitivity in 2007 and 2008, respectively. There was 100% sensitivity for TS and vancomycin. Other pathogens included MSSA (26%), Group A Streptococcus (3%) and *Proteus mirabilis* (0.6%). Although 56% of patients with skin abscesses were managed in the ED, 38% were initially seen by their primary care physician and subsequently hospitalized for



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
 Illinois College of Emergency Physicians ■

intravenous (IV) antibiotic and/or I&D of the abscess in the operating room (OR) or in the pediatric intensive care unit (PICU). Some of these procedures were performed by the pediatric surgeons.

Management of skin abscesses varied greatly at our institution, especially in terms of antibiotic usage.

No treatment or documentation	Warm compresses only	Oral abx only	IV abx only	Admit and I&D in OR	Admit and I&D in PICU	I&D in ED and discharged	I&D in ED and admitted for IV abx	Needle aspiration in ED and discharged
34	4	181	52	110	23	93	7	7

No documentation	70
Augmentin	20
Keflex	28
Clindamycin	81
TMP-SMX	178
Vancomycin	11
Vancomycin + cefotaxime/rocephin	6
Vancomycin + rifampin	58
Vancomycin + clindamycin	30
Doxycycline + rifampin	5
Amoxicillin	5
Unasyn	5
Ciprofloxacin	2
Azithromycin	2
Cefotaxime	1



Nafcillin	1
Clindamycin + cefotaxime/rocephin	4
Clindamycin + unasyn	2
Clindamycin + rifampin	1
Unasyn + cefotaxime	1

Discussions and Conclusion: Primary management of skin abscesses is surgical I&D. With the concern of CA-MRSA complications, there are recommendations for antibiotics such as clindamycin or TS, depending on one's regional antibiotic sensitivity pattern. The most commonly used oral antibiotic in our study was TS but Clindamycin may be a better choice since, unlike TS, it will cover Group A strep, and a high percentage of the CA-MRSA are sensitive to it .

A large proportion of the pediatric patients in our community with skin abscesses are being hospitalized for iv antibiotics and/or I&D in the OR or PICU. This is a costly practice. Primary care physicians may not be aware that I&D can be performed under procedural sedation in the ED.

A recent randomized controlled trial of pediatric CA-MRSA skin abscesses demonstrated similar rates of resolution between the placebo and antibiotic group following I&D. Routine hospitalization for iv antibiotics in the management of uncomplicated skin abscesses is not necessary, but if needed, the antibiotic of choice should be iv clindamycin in our community. Currently the most common iv antibiotic used is vancomycin (alone or in combination with rifampin or clindamycin). Vancomycin should be reserved for the critically ill patients or in refractory skin abscess cases since there are reports of increasing vancomycin resistance by *Staphylococcus aureus*.

Limitations: This is a retrospective study from one of 2 major hospitals in our area.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Clinical Indicators of Meningitis in a Cohort of Patients with High Clinical Suspicion: A Retrospective Study

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Objectives: Delay in diagnosing and treating bacterial meningitis can be catastrophic. However, the clinical presentation of meningitis can be varied and easily mimicked by other conditions. Our goal was to determine if, in those patients identified by Emergency Physicians as being high probability for meningitis, there were any clinical indicators that were more prevalent in patients with meningitis as opposed to those without.

Design: All Emergency Department (ED) patients evaluated for meningitis over a 2 year period were entered into the study. A retrospective chart review then looked at several clinical parameters including: temperature, heart rate, blood pressure, altered mental status, focal neurologic deficit, duration of symptoms, nausea, psychiatric symptoms, photophobia, neck pain, rash, prior antibiotic use, as well as final diagnosis. The data was analyzed for any difference between those patients ultimately diagnosed with meningitis and those who were not.

Results: Seventy-nine ED patients were identified as possibly having meningitis. Fourteen patients (17.7%) were ultimately diagnosed with meningitis, with 4 (5.1%) of these being bacterial meningitis and 10 (12.7%) being viral. Diagnoses in those patients found not to have meningitis were: "headache" (21/79, 26.5%), "sinusitis" (11/79, 13.9%), "viral illness: (8/79, 10.1%), and "fever" (4/79, 5.1%). Of the parameters that were evaluated, patients with any form of meningitis had significantly higher systolic blood pressures (mean=139.1 versus 123.3, $p=0.023$), diastolic blood pressures (mean=81.5 versus 75.4, $p=0.095$) and reported rates of nausea ($p=0.022$). The patients with bacterial meningitis had, on average, higher systolic pressures than those with viral meningitis; however, the significance is difficult to determine due to small sample size.

Conclusions: In ED patients evaluated for possible meningitis, those ultimately diagnosed with meningitis, viral or bacterial, had higher systolic and diastolic blood pressures and were more likely to complain of nausea. These findings may prove to be another tool in the assessment of patients with possible meningitis. Further study is needed to determine the usefulness of this predictor in differentiating bacterial from viral meningitis.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Tracking EKGs from the Emergency Department to the Floors

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Background: Our hospital uses an electronic medical record (EMR) and is considered “paperless.” Electrocardiograms (EKGs), however, are still printed on paper. Since our system is paperless, these paper EKGs were often misplaced and unavailable for future review. There is a system in place to upload electronic versions of the EKGs into the EMR. By protocol, this should be done every four hours. This was not being enforced and led to a lag of up to 48 hours before EKGs became electronically available. This would frequently complicate the inpatient care of patients or necessitate repeating EKGs needlessly.

Introduction: It is important for patient care and safety to facilitate the passage of information from one service to another when patient care is transferred. Monitoring serial EKGs is one very important way of establishing and tracking patient care and outcomes. If EKGs are not in a common system used by all staff their useful information cannot be accessed, used or impact pt care. A problem was identified with EKG tracking in the Emergency Department (ED) and a solution for their tracking was put in motion.

Study Objectives: This was a quality assurance project. The objective was to obtain a 100% compliance rate in uploading EKGs into the EMR.

Methods: Protocol already in place was to be enforced. Sign-in sheets were made and affixed to each EKG machine in the ED, and staff responsible for uploads signed when the machine was uploaded. This task had tiers of responsibility, and check and balances were established. This task became part of both the emergency medical technician’s (EMT) and charge nurse’s daily duty log. The charge nurse became the ultimate responsible party.

Results:

Week 1 - Talked to Charge nurses and EMTs – 87% compliance. The data was reviewed and staff who were not in compliance were identified and remediated.
Week 2 - Staff identified and remediated - 97.6% compliance
Week 3 – Continued reminders posted on white board and charge nurse computer – 100% compliance (make this section into short sentences. Example. In the first week of this new enforcement tool implementation, compliance was 87%. Non-compliant staff members were identified and re-educated. In week two, there was 97.6% compliance...)



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Conclusion: There has been a marked improvement in the electronic accessibility of EKGs performed in the ED. Many of our inpatient-service colleagues have noticed the change and expressed their gratitude for improving EKG uploading into the EMR, removing a frustration in providing appropriate care.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Patient Satisfaction in Emergency Department Patients with Abdominal Pain – The Effect of Routine Bedside Ultrasound on Patient Satisfaction in the ED

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Introduction: Patient satisfaction is both an *indicator* of quality of care, and a *component* of quality care. It is clear that patients quite actively evaluate what is happening to them during the experience of care. Ultrasound (US) has long been recognized as a powerful tool for use in the diagnosis and evaluation of many clinical entities. Most Emergency Departments now utilizing emergency screening ultrasounds report faster turn around times and more expedient diagnosis of potential life-threatening emergencies. Abdominal pain is a common complaint in the Emergency Department and an important one to determine benign versus life threatening etiologies. Often times patients need to be discharge following this complaint without a clear cause identified for their pain.

Study Objectives: We attempted to identify whether the use of screening bedside ultrasounds impacts patient satisfaction with the emergency department care in those patients presenting with abdominal pain.

Methods: *Inclusion criteria:* Patients over the age of 18 who present with a chief complaint of abdominal pain, back pain, or leg pain. *Exclusion criteria:* Medically unstable patients, patients unable to provide consent, patients under the age of 18, and prisoners.

Subjects were randomized to receive a bedside ultrasound in addition to their emergency department evaluation or standard emergency care. The ultrasound was performed at no-cost to the patient. At the completion of the subject's emergency department visit, the subject was asked to complete a brief patient satisfaction survey. The patient satisfaction survey is a previously validated survey from the Bureau of Primary Health Care.

Planned enrollment: 100 subjects, 50 subjects who received ultrasound and 50 who did not.

Results: As of the time of abstract submission less than the desired number of subjects had been enrolled and the sample size is 16. 14 received bedside ultrasounds



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

and 2 did not. Of those who received bedside ultrasounds, 11/14 or 78.6% rated their satisfaction on all 8 data points of good or very good.

Conclusion: This is a small sample size and a comparison is hard to make with these numbers. More subjects need to be enrolled and more variables need to be taken into consideration before an appropriate conclusion can be drawn from the data set.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Palliative Care Symptom Assessment in the Emergency Department: Validation of the Screening for Palliative Care Needs in the Emergency Department (SPEED) Instrument

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Background: Cancer patients who present to the emergency department (ED) often have palliative care needs that are underappreciated by ED staff. Symptom assessment tools are commonly used to quantify palliative needs in oncology and palliative medicine (PM) clinics; however, none have been adapted for use in the ED setting.

Objective: We sought to develop and validate a novel PM needs assessment tool for cancer patients in the ED.

Methods: An expert panel trained in PM and Emergency Medicine developed 13 screening questions, collectively referred to as the *Screening for Palliative Care Needs in the Emergency Department (SPEED)*, based on the five symptom domains of PM – physical, spiritual, social, psychological, and therapeutic. A database of 86 validated symptom assessment tools from PM literature, totaling 3011 questions, were then reviewed to identify screening questions similar to the 13 items of SPEED. One hundred seven related questions from the database were reviewed and adapted for standardization to a uniform 10-point Likert scale, and these items were randomly ordered to create a single survey of items, including the 13 SPEED questions. The 120-item survey was administered to any cancer patients visiting the ED of a large urban academic ED during daytime over a 10-week period. Data were analyzed to determine the degree of correlation between SPEED items and related items from the battery.

Results: A total of 53 subjects were enrolled, and 49 (92%) completed the survey in its entirety. 53% of subjects were male, age range was 24-88 years, and the most common cancer diagnoses were breast, colon, and lung. Cronbach's coefficient alpha for survey scales ranged from 0.716 to 0.991, suggesting correlation between SPEED and related assessment tools previously validated in other settings.

Conclusion: The SPEED symptom assessment tool is a valid instrument to screen for palliative care needs of cancer patients presenting to the ED.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
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Barriers to Obtaining a Point-of-Care Glucose in Emergency Department Triage

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Introduction: This study was performed to assess the barriers to obtaining a point-of-care (POC) glucose on diabetic patients that present to triage in the Emergency Department (ED). It was felt among ED care providers that a low percentage of diabetics had this important test performed during the triage process. There is no literature to support how often such a test actually gets performed or to address the nursing attitudes as to why the test is not performed during triage.

Methods: This was a prospective study where a research assistant surveyed the nurses in real time to assess why a POC glucose was not obtained on a diabetic patient during ED triage. The researcher reviewed the electronic medical record of all patients being triaged to see if they had a history of diabetes. If a diabetic patient did not have a POC glucose recorded while in triage, the researcher immediately handed that nurse a survey asking why the test was not performed. The survey included the following reasons: there is no glucometer in triage, it takes too much time to perform the test, the patient does not need the test, and a blank area for the nurse to place a different reason.

Results: During our three-week study period, 169 diabetic patients presented to ED triage. Of those, 60 (36%) patients had a POC glucose performed. The patients that had their glucose checked in triage had a mean glucose of 173mg/dL with a range of 46-495 mg/dL. The most common nursing reason for not checking a POC glucose was that the nurse did not feel it was necessary for the patient's care. This occurred in 62 (57%) patients. Of those patients 24 (39%) were determined to be ill enough to require hospital admission. For 45 (41%) patients it was felt that a room was available and the patients could have their glucose checked once in an ED bed. The time from door to physician in this group of patients was still 50 minutes. There were 22 (13%) patients during the study period that never had a glucose checked by either a POC or on a metabolic panel while in the ED.

Conclusions: Although the triage nurse often felt justified in not checking a POC glucose, the data reveals that a majority of diabetic patients would benefit from having their glucose checked while in triage. Further nursing education needs to be performed at this time to help increase the amount of diabetic patients that have their glucose assessed upon arrival to the ED.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Needs Analysis of Emergency Medicine Residents in Informed Consent Utilizing a Hybrid Simulation and Written Exam

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Methods: This study of Emergency Medicine (EM) residents measured knowledge, and assessed confidence and skill for performing informed consent (IC). A written exam tested knowledge, visual analog scales (VAS) quantified confidence and a hybrid simulation assessed performance. The simulation required consent of a patient surrogate, portrayed by a standardized patient actor (SP). SPs and residents scored the consent discussions by checklist.

Results: 38/45 (84%) of residents completed the exam and VAS. 100mm VAS demonstrated mean confidence scores of 81mm for procedure indications, 69mm for alternatives and 74mm for risks. Mean exam score was 55% (Standard Deviation SD 9.5), with no statistical difference between classes. For questions assessing knowledge of indications, alternatives and risks, residents correctly answered 77%, 64% and 36% respectively. Residents scored below one SD of the mean on 7/20 questions (35%). 6 of these questions addressed risks. 34/45 (76%) of residents completed the simulation. For SP scoring, 79% (SD 20) of checklist items were completed, with only statistical difference between the PGY1 and PGY4 classes ($p=0.03$). Resident self-scoring was similar to SP scoring. For 4/16 (25%) checklist items residents scored below one SD of the mean. These items assessed ability to provide alternatives.

Conclusions: All classes demonstrated similar performance and knowledge of IC. Simulation data indicate that residents discuss risks, but the written exam identifies a deficiency of knowledge about risks. Simulation data reveal a performance gap for discussing alternatives.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Pregnancy and Maternal Trauma: Predictors of High Risk Behaviors and Assault

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Introduction: Trauma during pregnancy is the leading cause of non-obstetric maternal mortality in the US. Alcohol and drug use are known risk factors for traumatic injury. Pregnant women are at increased risk for assault.

Objective: To determine predictors for both high-risk behaviors and assault in order to inform injury prevention efforts among pregnant women.

Methods: Retrospective cohort study was performed, analyzing the Illinois Department of Public Health Trauma Registry, which consists of all trauma cases statewide. All women aged 15-50 for the years 1999-2003 were identified and those more than 24 weeks pregnant were compared to a nonpregnant cohort. Demographic data were collected and multivariate regression analysis was performed.

Results: Of the 26,806 women reviewed, 2.4% (n=636) were pregnant. Pregnant women were significantly less likely than nonpregnant women to use alcohol (13.7% vs 42.0%, $p<0.001$) or drugs (9.7% vs 17.3%, $p<0.001$). In both pregnant and nonpregnant women, drug use was more likely to occur in those who used alcohol (OR 9.1, $p<0.001$ for pregnant women, OR 1.46, $P<0.001$ for nonpregnant women). Alcohol use was more likely to occur in those who use drugs (OR 8.7, $p<0.001$ for pregnant women, OR 1.46, $P<0.001$ for nonpregnant women). Among pregnant women, those who used alcohol were more likely to be uninsured (OR 3.1, $p=0.022$).

Assault was reported in 8.8% (n=56) of pregnant women. There was a trend towards significance for pregnant women who used alcohol (OR 3.1, $p=0.083$) or were uninsured (OR 2.9, $p=0.096$).

Conclusions: While pregnant trauma patients are less likely to engage in high risk behaviors, those who do engage in high risk behaviors are more likely than non pregnant women to engage in multiple high risk behaviors and be assaulted. These women who most need medical care are also more likely to be uninsured and hence left out of the medical system. These findings have important implications for social services and health care utilization.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

Increase in Non-Contrast Computerized Tomography Scans of the Head Following Popular Media Stories About Head Injury

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Background: On March 18, 2009 Natasha Richardson died after a head injury. It is possible that the rate of patients presenting with mild head injury and receiving CT scans may have been influenced by the Richardson event.

Hypothesis: There was a statistically significant increase in the rate of census adjusted head CTs performed for mild trauma after 3-16-2009 compared to prior to this date.

Methods: We included all with a non-contrast head CT performed from the ED between March 1, 2009 and April 15, 2009 for minor trauma. The primary outcome was the census adjusted rate of head CTs per time (# of head CTs/census). We compared the census adjusted rate for the 2 weeks prior to 2 weeks after the accident. To document media dissemination we searched Lexis-Nexis for news stories mentioning "Richardson."

Results: In the 2 weeks prior to 3/16/09 the census adjusted rate was 0.81% (95%CI 0.54 – 1.16) and there were no stories. The first media reports appeared on 3-16-09 (n=19) and quickly doubled (n=40, n=43) over the subsequent 2 days. The rate of CTs nearly doubled during the 2 weeks post accident 1.46% (1.10-1.91%). This absolute increase in rate percentage was statistically significant. (0.65%; 0.17 to 1.14%).

Conclusions: The percentage of all ED patients seen with mild trauma tested with head CT almost doubled when comparing the pre-Richardson accident vs post time periods. There was an increase in media reports of the accident that occurred rapidly after the event and peaked on day 3.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
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Educational Value of Helicopter Emergency Medical Services (HEMS) in EM Residency Training

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Introduction: The effective utilization of air-medical transport for critically ill or injured patient transport is an important skill for emergency physicians. The role of helicopter emergency medical services (HEMS) in the education of emergency medicine (EM) resident physicians is currently not well defined. The study explores the characteristics of EM resident physician HEMS training.

Methods: An anonymous survey of chief resident physicians in all 2008 U.S. Accreditation Committee for Graduate Medical Education (ACGME) approved EM residency training programs was conducted using an electronic mail-linked survey. Multiple choice, Likert scale (1 no value, 9 exceptional value) and short answer responses were utilized. Queries encompassed program demographics, aeromedical orientation and curriculum, safety education, and the value of the HEMS experience during residency training.

Results: Sixty-six chief residents responded from 135 EM residency programs in 23 states (49% response rate). Of those programs, 7.7% offered no HEMS training opportunity, 15.4% had a mandatory HEMS curriculum (mandatory), 73.8% had an optional or elective rotation (optional) and 3.1% offered moonlighting opportunities only (moonlight). Few programs had flight shift hours built into the EM schedule (27.9%), most flight shifts lasted 8-12 hours (73.9%) and most residents had <25 total flights during training (85.2%). Few programs utilized a formal aeromedical curriculum (36.2%), but most required a safety orientation (72.9%). Mandatory residents felt adequately trained to fly (90%) as compared to optional (46.5%) and moonlighting residents (50.0%) and reported a higher value to the program (6.67 vs. 4.41 vs. 5.0).

Conclusions: HEMS training in EM residency programs varies widely, with most programs offering an optional or elective rotation without a formal curriculum. EM residents who participated in mandatory HEMS training perceived a higher value to the training than other resident physicians.



2010 ICEP Spring Symposium & Annual Business Meeting
STATEWIDE RESEARCH SHOWCASE
Illinois College of Emergency Physicians ■

The Effect of a Regional STEMI Transfer Protocol on Improving the Time to Primary Percutaneous Angioplasty

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Introduction: Improved outcomes for ST-segment elevated myocardial infarction (STEMI) patients occur with regional referral hospital transfer to hospitals with primary percutaneous angioplasty (PCI) capability. However extended distance transfers often have a prolonged time to PCI. We describe a regional STEMI transfer program designed to minimize transfer time to a PCI center.

Methods: An observation cohort pre-post trial was conducted of all regional STEMI patients transferred from West-Central Illinois regional hospitals to an academic tertiary referral center. The Heart 777 Regional Protocol utilized a dedicated transfer telephone number that notified the interventional cardiologist, activated the cardiac catheterization laboratory and autolaunched the receiving hospital-based helicopter prior to case discussion. Thrombolytics were withheld unless significant transfer delays were present (i.e. weather). ED logs, helicopter transfer records, cardiac catheterization records and hospital medical records were abstracted for the intervention period (10/2007-9/2008) and a historical control period (10/2006-9/2007).

Results: Thirty-eight pre-intervention patients and 41 post-intervention patients were studied from 11 referring institutions (mean distance 46.2 miles). The intervention compared to the pre-intervention group had a decreased helicopter dispatch time (3.4 vs. 10.7 minutes (min); $p < 0.001$), decreased ground time (13.5 vs. 32.2 min; $p < 0.013$), and decreased facility to facility transfer time (93.61 vs. 129.74 min; $p = 0.006$). In the intervention group door to balloon times were significantly reduced (130.9 vs. 180.1 min; $p < 0.001$) and the proportion of patients with door to balloon times < 120 minutes was higher (41.7% vs. 0%; $p < 0.001$).

Conclusions: Regional STEMI transfer times to primary PCI hospitals and door to balloon times were reduced using the interventional protocol. Further protocol improvements may increase the proportion of PCI patients with total times < 120 minutes.