2012 ICEP

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STATEWIDE RESEARCH SHOWCASE

RESEARCH ABSTRACTS

Thursday, April 26, 2012

Advocate Christ Medical Center ■ Oak Lawn, Illinois

PRESENTED BY ILLINOIS COLLEGE OF EMERGENCY PHYSICIANS IN CONJUNCTION WITH **RESURRECTION MEDICAL CENTER** Resurrection Health Care

Statewide Research Showcase

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* Abstract was selected for presentation at the 2012 Spring Symposium

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Syncope in Pulmonary Embolism: Are These Patients Different?

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Introduction: Syncope is an uncommon presentation of pulmonary embolism (PE). The mechanism by which this occurs is unknown but has traditionally been attributed to hemodynamic collapse, although never thoroughly studied. Whether syncope is associated with a massive or sub-massive PE (more centrally located) and thus requiring more urgent intervention and care (e.g. administration of thrombolytic, intensive care admission) versus a smaller, more peripherally located PE and thus more hemodynamically stable patients remains largely unknown.

Study Objectives: This study will review Emergency Department (ED) cases of documented PE and compare the characteristics of those presenting with and without syncope.

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

Results: There were 674 PE reviewed over five years. 126 were excluded (73 not diagnosed by CT scans and 53 missing medical records), giving a sample size of 548.

The mean age was 68.9 years (SD:16.0) with 41.6% males. 10.0% (55/548) presented to the ED with a chief complaint of syncope. The syncope group had more non-specific ST-T wave changes (56.4% versus 36.9%; P=0.005), more sinus tachycardia (40.0% versus 24.9%; P=0.016), and more S1Q3T3 abnormality (20.0% versus 8.1%; P=0.004). The syncope group also had more saddle emboli (14.5% versus 3.9%; P=0.003). 316 patients had echocardiography and the syncope group had more right ventricular hypertrophy (37.8% versus 12.9%; P<0.001).

Conclusion: Patients diagnosed with pulmonary embolism who presented to the emergency department with syncope as their presenting complaint were more likely to have a large main-stem pulmonary artery or saddle embolism, have more right ventricular hypertrophy on echocardiogram, and more non-specific ST-T wave changes on ECG.

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Approaches to Patient Follow-Up Requirement in Emergency Medicine Residencies

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Background: Patient outcome follow-up (POFU) is an RRC-required element of emergency medicine (EM) training. POFU can also be used to assess the ACGME Core Competency of Practice-Based Learning. The exact form or frequency of POFU assessment among various EM residencies, however, is not currently known.

Objectives: We aimed to survey EM residencies across the country to determine how they fulfill the POFU requirement and whether certain program structure variables were associated with different POFU systems. We hypothesized that implementation of POFU systems among EM residencies would be highly variable.

Methods: In this IRB-approved study, all program directors of ACGME allopathic EM residencies were invited to complete a 10-question survey on their current approaches to POFU. Respondents were asked to describe their current POFU system's characteristics and rate its ease of use, effectiveness, and efficiency. Data were collected using SurveyMonkey™ reported using descriptive statistics.

Results: Of 158 residencies surveyed, 81 (51%) submitted complete data. Over three-fourths (76.1%) of EM residencies require monthly completion of POFUs. The mean total POFUs required per year was 78 (95% CI 58-98), with a median of 64 and a range of 2-400. Almost 2/3 (63%) of residencies use an electronic POFU system. Most (84%) 4-year EM residencies use an electronic POFU system, compared with half (54%) of 3-year residencies (difference 30%, 95% CI 5.1%-47.2%). Seven commercially available electronic programs are used by 71% of the residencies, while 29% use a customized product. Most respondents (88%) rated their POFU system as easy to use, but less than half (49%) felt it was an effective learning tool or an efficient one (45%). One-third (34%) would use a different POFU system if available, and almost half (44%) would be interested in using a multi-residency POFU system.

Conclusions: EM residency programs use many strategies to fulfill the RRC requirement for POFU. The number of required POFUs and the method of documentation vary considerably. About two-thirds of respondents use an electronic POFU system. Less than half feel that POFU logs are an effective or efficient learning tool.

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An Experimental Comparison of Endotracheal Intubation During Ongoing CPR With Manual Compression versus Automated Compression

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Background: The ACLS recommendations for CPR are that chest compressions should be uninterrupted to help maintain perfusion pressures. Every time CPR stops the perfusion pressure drops and it takes time to get back up to a clinically helpful level. One common reason CPR is stopped in the ED or in the prehospital setting is to place a definitive airway through tracheal intubation. Intubation during ongoing compressions is difficult due to the randomness of tracheal motion secondary to the chest compressions.

Objectives: We seek to examine whether intubation during CPR can be done as efficiently as intubation without ongoing CPR. The hypothesis is that the predictable movement of an automated chest compression device will make intubation easier than the random movement from manual CPR.

Methods: The project was an experimental controlled trial and took place in the emergency department at a tertiary referral center in Peoria Illinois. Emergency medicine residents, attendings, paramedics and other ACLS trained staff were eligible for participation. In randomized order, each participant attempted intubation on a mannequin with no CPR ongoing, during CPR with a human compressor, and during CPR with an automatic chest compression device (Physio Control Lucas 2). Participants could use whichever style laryngoscope they felt most comfortable with and they were timed during the three attempts. Success was determined after each attempt.

Results: There were 43 participants in the trial. The success rate in the control group and the automated CPR group were both 88% (38/43) and the success rate in the manual CPR group was 74% (32/43). The difference in success rates were not statistically significant (p=0.99 and p=0.83). The mean time for intubation with manual CPR and no CPR were not statistically different (17.1 sec, 18.1 sec; p=0.606). The automated CPR group had the fastest average time (13.6 sec; p=0.019).

Conclusion: The success rate of tracheal intubation with ongoing chest compression was the same as the success rate of intubation without CPR. Although intubation with automatic chest compression was faster than during other scenarios, all methods were close to the 10 second timeframe recommended by ACLS. Based on these findings, it may not always be necessary to hold CPR to place a definitive airway, however, further studies will be needed.

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Laceration Repair Using Rapid Absorbing Suture in the Emergency Department Improves Resource Utilization: Saving Time and Money

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Background: A 2012 survey by the CDC revealed that 1 in 5 American families were having significant difficulty paying their medical bills. Additionally, hospitals nationwide constantly work to contain costs, prevent unnecessary treatments, and optimize billing. In the 2011 Medicare Report to Congress, it was reported that 64% of hospitals are losing money caring for Medicare patients. Improved utilization management is required if hospitals are to continue providing the current standard of care.

Study Objectives: With the assumption that the vast majority of lacerations are repaired with non-absorbable sutures, the goal of this study was to demonstrate improved patient and health care resource utilization through the use of absorbable sutures instead of non-absorbables for lacerations closed in the emergency department.

Methods: A Medline review of the literature was performed analyzing data that demonstrate the functional and cosmetic results following emergency department repair using rapid absorbable sutures compared to other methods. Additionally, our single, urban, academic institution was used as a representative to determine the cost of materials used for various types of skin repair. A basic comparative cost analysis was performed. Also, we researched the universal Medicare billing procedures for suture removal cost to patients.

Results: Multiple studies have proven the safety and effectiveness of absorbable plain gut sutures compared to non-absorbable sutures. Specifically, two prospective cohort studies used blinded, plastic surgeons to compare the cosmetic results of emergency department wound repairs using a validated score. The results showed that there was no significant difference in the cosmetic outcomes or complication rates.

Comparative analysis showed that using a single absorbable plain gut suture and laceration repair kit at our institution costs $8.25 in materials. The same repair with a single nylon suture, followed by removal in the patient's primary care physician's office using a standard kit, costs $27.79. Neither of these sums accounted for additional materials costs (betadine, gauze, etc.), professional time, and costs to the patient for missed work.

Medicare CPT 99211 is used to charge for suture removal by primary physicians with a $21.04 reimbursement. If sutures are removed at the same facility where placed, Medicare cannot be billed for additional costs incurred.

In our institution, there are approximately 2,200 lacerations repaired per year. We estimate that eliminating routine followup visits with primary care physicians would save Medicare $43,000 annually at our hospital alone. If this were to be extrapolated out for the estimated 11 million lacerations repaired annually in the United States, this method could save Medicare upwards of $215,000,000 per year.

Conclusion: The routine use of absorbable gut sutures for laceration repair leads to a greater cost savings overall by eliminating the mandatory follow up visits which require materials and professional time, but do not generate significant revenue. The potential cost savings to Medicare would be great, and this data acts as a proxy for insurance companies and self-payers alike. Patients benefit by having fewer missed work and school days, less billing by primary physicians, and the elimination of psychologically traumatic suture removal for pediatric patients and parents.

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Ultrasensitive Cardiac Troponin Assay as a Predictor of Need for Coronary Intervention After Diagnostic Angiography

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Background: New ultrasensitive troponin assays have been shown to identify a patient with an acute MI earlier than standard cardiac troponin assays, but the resulting need for coronary intervention is uncertain.

Objectives: We sought to determine whether an ultrasensitive cardiac troponin assay predicted the need for coronary intervention in patients who had undergone diagnostic angiography, hypothesizing an increased likelihood of intervention in patients with positive assays.

Methods: We analyzed data from a prospective, commercially-sponsored assay study of moderate-risk patients presenting to the ED with chest pain, angina or suspected ischemic symptoms in which a minimum of two troponin measurements using an ultrasensitive assay were planned. Patients were followed until discharge from the hospital, with intervention defined as either percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG).

Results: A total of 242 patients were enrolled over a 12-month period. Of these, 32 had a positive first assay (>0.05 µg/L), while another 4 had a positive second assay; 24 of these patients received diagnostic angiography and 16 required intervention. In contrast, 27 of 206 patients without positive assays received diagnostic angiography, with 15 requiring intervention, suggesting only a non-significant increase in the likelihood of interventional requirements based on troponin result (OR 1.86, 95% CI 0.6 to 6.8).

Conclusions: Positive ultrasensitive troponin assays did not significantly increase the likelihood of coronary intervention after the performance of diagnostic angiography in this population of patients.

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Antimicrobial Resistance Patterns in Urine Cultures Sent from the Emergency Department

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Introduction/Study Objectives: Antimicrobial resistance is an international problem that affects all emergency departments. Our goal was to examine all urinary pathogens and their subsequent resistance patterns from urine cultures collected in the Emergency Department (ED).

Methods: This study was performed at an urban/suburban community-teaching hospital with an annual ED volume of 40,000 ED visits. Using electronic laboratory and billings records, all cases of positive urine cultures received from the ED in 2009 were reviewed and data abstracted including type of bacteria, antibiotic resistance, and study patient healthcare exposure (HCX). HCX was defined as no prior hospitalization within the previous six months, hospitalization within the previous three months, hospitalization within the previous six months, nursing home/extended care facility resident (NH), and presence of an indwelling urinary catheter (UC). A study investigator abstracted all data with a second investigator re-abstracting a random 5% for Kappa statistics between 0.697 and 1.00. Group comparisons were made using Pearson Chi-square or Fisher test as appropriate and confirmed with simple logistic regression. Significance was set at 0.05.

Results: 1935 positive urine cultures were obtained from the ED in 2009. Seventy-nine cultures were excluded as contaminants and one culture was excluded due to missing data, leaving a total sample size of 1855. 52.4% (972/1855) of our study patients had no HCX within the previous six months, 27.9% (517/1855) were NH residents, 19.7% (366/1855) had HCX within the previous six months, and 15.6% (279/1855) had HCX within the previous three months. 28.4% (527/1855) were from patients that had a UC. Pathogens obtained from culture results included: Escherichia coli (56.9%), Klebsiella (10.4%), Enterococcus (10.1%), Proteus (8.9%), Pseudomonas (4.4%), Staphococcus aureus (2.5%), Citrobacter (2.3%), and Enterobacter (1.9%). These eight pathogens accounted for 97.5% of all positive cultures. The antibiotic resistance pattern for Escherichia coli was significantly affected more by HCX (P-values 0.001 to 0.008) than UC (P-values 0.033 to 0.554). Proteus resistance patterns were similar to Escherichia coli but Klebsiella was the opposite, being more affected by UC than HCX.

Both vancomycin-resistant Enterococcus and Methicillin-resistant Staphococcus were significantly associated with HCX and not UC.

Conclusion: Our study results maintain that E. coli is the most common pathogen seen in all of our collected urine cultures sent from the ED regardless of healthcare exposure. It further suggests that antimicrobial resistance is adversely affected by patient healthcare exposure and presence of an indwelling urine catheter.

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Resident Performed Abdominal Ultrasounds in the ED: Correlation with Radiologists

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Introduction/Study Objectives: Patients with acute abdominal pain presenting to the Emergency Department (ED) comprise approximately 4-5% of annual visits and the possible etiologies are numerous. ED ultrasonography is an established practice and required by ABEM to be a part of residency training. The use of ultrasound in the ED is frequently followed by formal radiological studies. The purpose of the study is to examine: 1) the correlation of emergency department abdominal ultrasounds (AUS) and the formal radiological study in adult patients who present with acute abdominal pain, 2) the ability of trained Emergency Medicine (EM) residents to accurately perform and interpret AUS as compared to trained attending emergency physicians (EP).

Methods: Retrospective study at an urban/suburban ED with an EM Residency and Ultrasound Fellowship. Clinical ultrasounds performed in the ED (by a resident, attending or both) are recorded, confirmed with a formal Radiology study, and reviewed by the ultrasound faculty. Two investigators extracted data from the ultrasound log and Radiology electronic records. A third investigator independently reviewed all cases which correlated negatively with the radiological report. Descriptive statistics were calculated and differences between resident only scans and attending physician scans tested using Pearson Chi-square. Pre-hoc calculations found a sample size of 308 giving 80% power to find at least 10% differences between groups.

Results: 387 patients were reviewed, 31 cases excluded for missing data, giving n=356. 458 scans were performed including 217 (47.4%) gallbladder, 164 (35.8%) renal, 64 (14.0%) aorta, and 13 (2.8%) FAST scans. 74.4% of the cases had a confirmatory CT scan while the remaining 25.6% had a confirmatory US scan by Radiology. 66.3% (236/356) of the cases were performed by both a resident and attending, 28.7% (102/356) were performed by residents alone, while only 5.1% (18/356) were performed by attending alone. Overall, the correlation with the radiologist's findings was 91.5% (419/458). By modalities the correlation was: gallbladder, 93.5%, renal, 86.0%, aorta, 96.9%, and FAST, 100%. When stratified by operators, resident only scans were no different than resident plus attending or attending alone scans in all four modalities (P-value = .994, .283, .698, NA). EP missed 6 (2.8%) gallstones and misidentified 23 (14.0%) cases of hydronephrosis (16 false positive, 7 false negative). EP correctly identified all 16 abdominal aortic aneurysms confirmed by Radiology.

Conclusion: In this study, the overall correlation between emergency physician bedside abdominal ultrasounds and Radiology confirmatory findings was 91.5%. This study suggests that trained EM residents can perform abdominal ultrasound scans alone with the same results as when attending physicians are involved. The lowest correlation with Radiology involved the misidentification of hydronephrosis.

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ED Gallbladder Ultrasounds: Correlation with Pathology

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Study Objective: Our goal was to perform a retrospective analysis of all emergency bedside gallbladder ultrasounds (EBU) performed by appropriately trained emergency physicians (EP) over a 30-month period. Study patients who had identified pathologic gallbladder findings on EBU and radiology performed gallbladder ultrasounds, subsequently underwent cholecystectomy. The surgical pathologic findings were compared with EBU findings.

Methods: We conducted a retrospective study of EBU performed by appropriately trained EP on patients with suspected cholecystitis from April 2008 to December 2009. All EBU were performed and recorded by physicians meeting the minimum requirements recommended by ACEP (25 gallbladder scans). Findings recorded included sonographic Murphy's sign, gallstones, sludge, gallbladder distention, anterior wall thickness, and presence of pericholecystic fluid. Recorded results were extracted from the electronic EBU records, reviewed by the Emergency Medicine Ultrasound Director, and compared to the official radiology and surgical pathology reports.

Results: 202 cases of suspected cholecystitis were reviewed with 22 cases being excluded for missing radiologic and/or pathologic reports (n = 180). 169/180 (93.9%) had an official radiology department ultrasound (US) or computed topography of the abdomen and pelvis performed. There was agreement in 164/169 (97.0%) cases between radiology and EP performed gallbladder ultrasounds. Of the 180 included cases, 100 had surgical pathology reports including 31% diagnosed with acute cholecystitis, 61% diagnosed with chronic cholecystitis, and 90% diagnosed with cholelithiasis. Overall, EBU diagnosed 95.6% of all gallstones found on pathology. The findings of sonographic Murphy's sign (P=.374), gallstones (P=.221), sludge (P=.262), and presence of pericholecystic fluid (P=1.00) were no different between acute and chronic cholecystitis. There were more anterior wall thickening found in acute cholecystitis (44.1% versus 14.8%; RR: 2.34, 95% CI: 1.42, 3.83; P=.002)

Conclusion: Our study results confirm prior studies indicating that EP are able to diagnose gallbladder abnormalities with similar accuracy as radiology department performed ultrasonography. EP are also able to diagnoses the vast majority of gallstones found on pathology. The bedside ultrasound findings used in this study do not easily allow the clinician to differentiate between acute and chronic cholecystitis.

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Stick and Tell: A Survey of Emergency Medicine Residents and Needlestick Exposures

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Introduction: An estimated 400,000 to 800,000 needlestick injuries annually in the US involves healthcare workers. Although percutaneous injury (PCI) are a common occurrence in the Emergency Department (ED), there is a large discrepancy between the number of actual events and the events reported to employee health. Despite the potentially serious consequences of PCI, practitioners often downplay the occurrence and do not report exposures.

Study Objectives: This study was conducted in order to investigate needlestick incidence and the resident's attitude associated with reporting injuries. It was also designed to investigate negative connotations associated with PCI.

Methods: Using an internet based platform, a voluntary anonymous survey was distributed amongst all current allopathic EM residents in the state of Illinois during January to February of 2011. Each resident was sent a maximum of three requests for survey responses. Statistical comparisons between groups used Student-t, Chi-squared, or Fisher test with significance at 0.05

Results: 304 surveys were distributed, 5 were incomplete and 208 were returned for a response rate of 68.4%. Overall, 55.3% of respondents had at least one PCI with a mean of 1.73 sticks per resident. Of those who had a needlestick, 36.5% of respondents did not report it. Significantly more residents who failed to report perceived possible risk to be low (90.2% versus 40.3%; P<.001). Fear of negative repercussions (P=0.350) and lack of comfort with a procedure (P=1.00) did not influence residents' decisions to report their PCI. Only 5.8% of respondents felt that it is more unacceptable for a physician to get a needlestick compared to a nurse or EMT and only 5.4% of residents think needlestick injuries affect attendings' confidence in their abilities to perform procedures. Only 16.9% of residents would judge their peers procedurally less competent if they had one or more needlesticks but 24.3% would be embarrassed if fellow residents knew they had a PCI.

Conclusion: Over half of all ED residents report at least one PCI during their training; however, over a third of these residents do not report the PCI. The primary reason that residents who failed to report was a self-perceived risk to be low. Fear of negative repercussions and lack of comfort with a procedure do not seem to influence report of PCI.

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An Experimental Comparison of Endotracheal Intubation Using a Blind Supraglottic Airway Device During Ongoing CPR With Manual Compression versus Automated Compression

Bob Cambridge, DO, MPH; Amy Chelin, MD; Austin Lamb, MD;
University of Illinois College of Medicine at Peoria

Background: There are a variety of devices on the market, designed to quickly provide an airway during resuscitation efforts. A new device, the Supraglottic Airway Laryngopharyngeal Tube (SALT, Life-Assist) is designed for blind tracheal placement of an airway. Use of the device in previous studies has been in static models.

Objectives: We seek to examine whether use of the SALT device can provide reliable tracheal intubation during ongoing CPR. The dynamic model tested the device with human powered CPR (manual) and with an automated chest compression device (Physio Control Lucas 2). The hypothesis is that the predictable movement of an automated chest compression device will make tracheal intubation easier than the random movement from manual CPR.

Methods: The project was an experimental controlled trial and took place in the emergency department at a tertiary referral center in Peoria Illinois. This project was an expansion arm of a similarly structured study. Emergency medicine residents, attendings, paramedics and other ACLS trained staff were eligible for participation. In randomized order, each participant attempted intubation on a mannequin using the SALT device with no CPR ongoing, during CPR with a manual compression, and during CPR with an automatic chest compression. Participants were timed in their attempt and success was determined after each attempt.

Results: There were 43 participants in the trial. The success rate in the control group and the automated CPR group were both 86% (37/43) and the success rate in the manual CPR group was 79% (34/43). The difference in success rates were not statistically significant ($p=0.99$ and $p=0.41$). The mean time for intubation with manual CPR and no CPR were not statistically different (9.042 sec, 8.770 sec; $p=0.738$). The automated CPR group had the fastest average time but the difference was not significant (8.051 sec; $p=0.144$).

Conclusion: Using the SALT device, the success rate of tracheal intubation with ongoing chest compression was similar to the success rate of intubation without CPR. The SALT device did not guarantee a secure airway every time in a dynamic scenario and it had the drawback of not providing direct visualization during placement. The SALT device is a helpful adjunct but should not replace a direct visualization method for a first line intubation attempt in the ED.

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Child Passenger Restraint Misuse in Rural vs. Urban Children: A Multisite Case-Control Study

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Background: Motor vehicle crashes (MVC) are the leading cause of childhood fatality, making child passenger safety restraint (CPS) usage a public health priority. While MVCs in rural environments are associated with increased injuries and fatalities, no literature currently separates and focuses CPS misuse by geographic location.

Objectives: We hypothesize that proper CPS usage will be lower in a rural population as compared to a similar matched urban population.

Methods: A multisite (Alabama, Arkansas, Illinois), observational, case-control study was performed using rural (economically and population controlled) CPS unscheduled check data collected during the Strike Out Child Passenger Injury Trial and unscheduled urban CPS check data matched by age, site and year. All CPS checks were performed using nationally certified CPS technicians who utilized the best practice standards of the American Academy of Pediatrics and collected subject demographics, misuse patterns and interventions using identical definitions. Misuse patterns were defined using National Highway Traffic Safety Administration (NHTSA) standardized criteria and examined by state, location, age and type. Pearson-chi square and fisher's test were conducted using SAS 9.2. The two-tailed p values were calculated and p 0.05 was considered for statistical significance.

Results: Four-hundred eighty-four CPS checks (242 rural and 242 urban) involving 603 total children (<1 years 46 (8%), 1-3 years 215 (36%), 4-8 years 321 (53%), ≥9 years 21 (3%)) from three states (AL 43 (7%), AR 442 (73%), IL 118 (20%)) were examined; of which, 86% had at least one documented CPS misuse (arrived unrestrained 6%, improper direction 6%, harness incorrect 66%, LATCH incorrect 52%, airbag location 11%, seatbelt loose 49%, incorrect tether 63%). CPS misuse did not vary by age category (p=0.31) but did by state (p=0.001). Rural CPS

misuse was more common than urban CPS misuse (91.5% vs. 81.2%; p =0.0002, OR=2.5, 95% CI=1.5-4.1).

Conclusion: In this multisite study, rural location was associated with higher CPS misuse. CPS education and resources that target rural populations specifically appear to be justified.

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The Effectiveness of a Nurse Telephone Triage Protocol for Emergency Department Disposition During the H1N1 Epidemic Of 2009

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Background: The H1N1 influenza epidemic impacted already overcrowded ED resources and highlighted the need for effective patient triage during widespread contagious outbreaks. Adequate public triage is necessary to avoid dangerous ED overcrowding while identifying patients needing advanced medical care. Nurse assisted public telephone triage represents a simple but possibly effective tool that can screen large numbers of patients with influenza-like illness.

Objectives: This study evaluates the effectiveness of a nurse telephone triage protocol during the H1N1 epidemic of 2009.

Methods: A retrospective observational cohort trial was conducted of all patients contacting a hospital-based nurse telephone triage service during the 2009 H1N1 epidemic (peak community health department prevalence 9/28/09 - 11/9/09). Patients were screened using an adapted CDC criteria protocol for influenza-like illness and further assessed for illness severity and complicating medical conditions; triage logs were recorded in an associated hospital EMR (Epic 2010, Epic Systems Inc.). Triage calls utilizing the protocol, as well as any associated outpatient or ED visits over the next 24 hours were queried. Patient demographics, interventions and disposition were abstracted. Ten nurse triage dispositions were grouped into 4 categories (homecare, physician notification, outpatient physician visit and ED visit). Group differences were analyzed using Chi-square.

Results: Three-hundred fifty triage calls (287 pediatric, mean age 7.8 years; 63 adult, mean age 41.3 years) were documented. Overall, 254 (72.6%) patients followed the recommend disposition. Patients triaged to outpatient physician visits had higher compliance than those triaged to the ED (85.9% vs. 53.3% $p<0.01$).Twenty-seven patients (18.5%) were evaluated in the ED and 20/27 (74.1%) were diagnosed with influenza-related illness; no ED visits required hospital admission. The telephone triage protocol was highly specific (0.95, 95% CI 0.94-0.97) but poorly sensitive (0.26, 95% CI 0.13-0.42) for predicting ultimate patient disposition.

Conclusion: In our population, during the 2009 H1N1 influenza epidemic, a nurse telephone triage was effective in delineating ultimate patient disposition. Nurse telephone triage may be one means to adequately distribute medical resources during epidemics.

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Incidence of Serial Increase in Ultrasensitive Cardiac Troponin Concentrations in ED Patients with Suspected Ischemia

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Background: Serial testing using new ultrasensitive assays of cardiac troponin has been widely adopted by hospitals, but with uncertain benefit.

Objectives: We measured the incidence of serial troponin increase (second troponin assay positive when first was negative) in moderate risk patients presenting with chest pain, angina, or suspected ishcemic symptoms, hypothesizing a low incidence of occurrence.

Methods: Data from a prospective, commercially-sponsored trial of an ultrasensitive troponin assay were analyzed. Patients presenting to a single community ED were eligible for this study if serial troponin assays were ordered as part of a chest pain workup plan.

Results: A total of 242 patients were enrolled in 12 months. Out of these, only 4 patients (1.6%, 95% CI 0.6% to 4.1%) developed a positive assay (>0.05 µg/L) after an initial negative assay, while a total of 32 (13%, 95% CI 9.5% to 18%) had initial positive assays. Of these 4 patients, only 2 received diagnostic angiography, with only 1 requiring coronary intervention.

Conclusions: Less than 2% of patients being evaluated for chest pain with serial ultrasensitive troponin assays in this sample developed a positive assay after an initial negative assay.

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Association Between Gender and In-hospital Mortality in Emergency Department Patients With Suspected Sepsis

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Background: The impact of gender on outcomes in patients with sepsis is controversial and inconsistent between animal and human studies.

Objectives: We sought to determine if gender was an independent predictor of in-hospital mortality in ED patients with suspected sepsis. We hypothesized that female gender would confer survival benefit.

Methods: We analyzed data from a single center double-blind randomized controlled trial evaluating the effects of etomidate versus midazolam for intubation on outcomes in ED patients with suspected sepsis. Critically ill patients who were suspected of having sepsis were randomized to receive either etomidate or midazolam before intubation. We performed this secondary analysis to determine the effects of gender on in-hospital mortality while controlling for severity of illness as measured by the Simplified Acute Physiology Score II (SAPS II).

Results: A total of 122 patients were enrolled, of which 2 were lost to follow up. Of the 120 patients, 68 (57%) were male and the overall in-hospital mortality was 47/120 (39%). The mortality in males was 25/68 (37%) and in females was 22/52 (42%). When controlling for severity of illness as measured by the SAPS II score, male gender had a slight but non-statistically significant increase in mortality (OR 1.13, 95% CI 0.53 to 2.4).

Conclusion: In this patient population, gender was not associated with in-hospital mortality differences in patients with suspected sepsis.

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

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Introduction/Objectives: The diagnosis of acute pancreatitis (AP) in the Emergency Department (ED) is challenging and increased morbidity and mortality have been seen with age and co-morbidities. Amylase and lipase levels three times normal has been established to have sensitivity and specificity of 100% and 95% when diagnosing AP. However, age-related structural and enzymatic changes are commonly seen with advanced age. 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 from a single community teaching hospital ED. Patients had amylase and lipase drawn within 24 hours of ED visit and CT abdominal scans of the pancreas within 48 hours of visit. Data collected included demographics, amylase and lipase levels, CT abdominal scan results, and final discharge diagnosis. Data collection was performed by all investigators. All abnormal CT reports were reviewed by all investigators and a patient was considered to have AP if the CT scan showed evidence of acute inflammation of the pancreas. Sensitivity and specificity were calculated with 95% confidence intervals.

Results: There were 1266 patients 65 years or older seen in the ED with serum amylase/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 previously 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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Asthma Inhaler Education in Emergency Medicine Residency

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Introduction: As the prevalence of asthma continues to increase across the US, so does the number of related Emergency Department (ED) visits. An integral part of asthma management is patient education. Emergency Medicine residents require knowledge of current treatment modalities, primarily asthma inhalers, to help aid in the acute care setting and avert further preventable visits to the ED.

Study Objectives: This study tested Emergency Medicine (EM) residents' understanding of asthma inhaler use and application, and determined if a single teaching session can lead to improvement.

Methods: Following IRB approval, EM residents from a three year program based at three urban community teaching hospitals with over 2500 acute asthma visits per year were asked to voluntarily enroll in this study. They were given a questionnaire with six questions regarding the pharmacology, physiology, and use of MDI inhalers. There was also one question about the practical application of MDI. This question required the resident to correctly identify the correct nine step sequence for application. An educational intervention, consisting of a single didactic session was given and following one month, participants repeated the same questionnaire. Pre and post comparisons were made using Student t-test or Fisher exact test as appropriate. Significance was set at 0.05.

Results: 27 residents completed the quiz prior to education and 29 residents one month after. There was an equal distribution of residents at all levels. Of the 27 residents taking the pre-test, 48.1% (13/27) have never had any formal instruction in the use of MDI. One month following an education intervention, the post-test show significant improvement in both knowledge and practical application of MDI. Knowledge on average increased from 38.3% to 66.7% ($P<0.001$) while practical application improved from 49.8% to 76.2% ($p<0.001$). A perfect application score increased from 7.4% of the residents to 41.4% of the residents ($P=0.003$).

Conclusion: In this small study, 48.1% of EM residents have never had formal education or instruction in the use of MDI inhalers. This was reflected in low scores on both knowledge and applications questions. However one month following a single didactic session, both knowledge and application scores were significantly increased.

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Pediatric Trauma Transfers from a Community Emergency Department

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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 review pediatric transfers from a community ED for trauma.

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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Subdural Hematoma: Alcohol Levels and Time to Diagnosis

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Introduction: Subdural hematoma (SDH) is frequently associated with intoxicated Emergency Department (ED) patients and it is known that intoxicated patients are at higher risk. However, it is not known if the degree of intoxication has any clinical impact on the expeditious diagnosis of subdural hematoma in the ED. This study reviews SDH presenting to the ED and compare time to CT head scan and acute alcohol intoxication.

Methods: This is a retrospective chart review of all SDH presenting to the Emergency Department (ED) at two community hospitals over a three year period. The main outcome of interest is the time from initial presentation in the ED to time of diagnostic CT head scan. Data collection included demographics, chief complaint, initial presentation of intoxication (or not), alcohol level, drug screens, and disposition. A second investigator re-abstracted 15% of the data with Kappa statistics between .859 and 1.00. Alcohol intoxication was defined as a level ≥ 80mg%. Group comparisons are made using one way ANOVA or Fisher exact test with alpha set at 0.05.

Results: 135 SDH patients were reviewed with 51.1 % male and mean age of 73.5 years (SD: 17.4). 13.3% (18/135) had alcohol intoxication with mean level of 274mg% (range: 117-474). 76.3% (103/135) of the cases presented with a history of trauma, followed by headaches at 8.1% and syncope at 5.2%. There were similar numbers of intoxicated (72.2 %) and non-intoxicated patients (76.9%) presenting with a history of trauma. Mean time to CT head scan was 1.90 hours for 13 intoxicated trauma cases versus 1.29 hours for 90 non-intoxicated trauma (P=.031). For the 32 non-trauma cases, mean CT time was .80 hours for the intoxicated patient versus 1.29 hours for non-intoxicated (P=.031). Of intoxicated trauma cases, 23.1% (3/13) had CT times > 3hours versus 3.3% (3/90) of the non-intoxicated trauma cases (P=.026)

Conclusion: In this community based study, 76.3% of subdural hematomas presented with a history of trauma. Those trauma patients also intoxicated with alcohol had increased time to CT head scans. Emergency physicians should be aware that alcohol intoxication may delay the expeditious diagnosis of traumatic subdural hematoma in the Emergency Department.

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Emergency Medicine Resident Physician Attitudes about the Introduction of a Scribe Program at an Academic EM Training Site

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Background: ED scribes have become an effective means to assist emergency physicians (EPs) with clinical documentation and improve physician productivity. Scribes have been most often utilized in busy community EDs and their utility and functional integration into an academic medical center with resident physicians is unknown.

Objectives: To evaluate resident perceptions of attending physician teaching and interaction after introduction of scribes at an EM residency training program, measured through an online survey. Residents in this study were not working with the scribes directly, but were interacting indirectly through attending physician use of scribes during ED shifts.

Methods: An online ten question survey was administered to 31 residents of a Midwest academic emergency medicine residency program (PGY1-PGY3 program, 12 annual residents), 8 months after the introduction of scribes into the ED. Scribes were introduced as EMR documentation support (Epic 2010, Epic Systems Inc.) for attending EPs while evaluating primary patients and supervising resident physicians. Questions investigated EM resident demographics and perceptions of scribes (attending physician interaction and teaching, impact on resident learning, willingness to use scribes in the future), using Likert scale responses (1 minimal, 9 maximum) and a graduated percentage scale used to quantify relative values, where applicable. Data was analyzed using Kruskal-Wallis and Mann-Whitney U tests.

Results: Twenty-one of 31 EM residents (68%) completed the survey (81% male; 33% PGY1, 29% PGY2, 38% PGY3). Four residents had prior experience with scribes. Scribes were felt to have no impact on attending EPs direct resident interaction time (mean score 4.5, SD 1.2), time spent bedside teaching (4.8, SD 0.9), or quality of teaching (4.9, SD 0.8), as well as no impact on residents' overall learning process (4.6, SD 1.1). However, residents felt positive about utilizing scribes at their future occupation site

(6.0, SD 2.7). No response differences were noted for prior experience, training level or gender.

Conclusion: When scribes are introduced at an EM residency training site, residents of all training levels perceive it as a neutral interaction, when measured in terms of perceived time with attending EPs and quality of the teaching when scribes are present.