2010 *Western Journal of Emergency Medicine* Residency Abstract Competition

Thank you to all who submitted abstracts to the first annual "Resident Original Research Competition." We received submissions from 18 programs; all excellent examples of scholarly work done by the next generation of emergency medicine leaders. All authors are invited to submit a full manuscript for peer-review. *WestJEM* will publish the best of these papers.

The winner for 2010 – 2011 is an abstract submitted by Nicholas Caputo MD at Lincoln Medical and Mental Health Center entitled "Violent and Fatal Youth Trauma: Is There a Missed Opportunity?" With his co-investigators, Dr. Caputo documents the poor outcomes seen in patients caught up in the cycle of violence that many of our patients experience. Their research strengthens the argument that early intervention in this population has tremendous potential.

1. Violent and Fatal Youth Trauma: Is there a missed opportunity?

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Objective: Accidents and assaults (homicides) are the leading causes of death among the youth of the United States. They account for 53.3% of deaths among children aged 1-19 years old. Youth violence is a significantly growing public health problem. Risk factors offered for the incidence of violent traumatic death include socioeconomic status, race, and place of residence (rural vs. urban). With five-year mortality rates for recidivism reach as high as 20%, it is important to determine whether victims with a history of violent trauma are at increased risk of fatal outcome. We hypothesize that victims of violent trauma who have one prior visit of violent trauma will have an increased odd of fatal outcome.

Methods: A retrospective chart review was conducted for patients presenting with penetrating trauma to the emergency department (ED) from January 1, 1999, to December 31, 2009. Any patient between the ages of 15 to 25 years old, who presented to the ED for any penetrating trauma were included. Patients with prior presentations for penetrating trauma were compared to those patients who were first time presenters to determine the odds ratio (OR), with statistical significance set at the $p<0.05$ level.

Results: Overall 15,395 patients were treated for traumatic presentations. Of these, 1044 patients met the inclusion criteria. Demographically, 79.4% were Hispanic, 19.4% were African-America and 0.96% was Caucasian. The average age was 21-years-old, and 98% of the population was male. One hundred and forty-seven (14%) had prior presentations, and 897 (86%) did not. Forty of the 147 patients (27%) with prior presentations had a fatal outcome compared to 29 patients of the 868 (3%), odds ratio 11.2 (95% CI 6.6-18.8, Pearson Chi Square $p<0.001$). A five-year mortality rate for those patients with fatal outcomes was calculated to be 16.5%.

Conclusion: Those who had prior ED visits for penetrating trauma were at greater risk of fatal outcomes compared to those with no prior visits. Therefore, trauma related ED visits might offer an opportunity for education and intervention. This may help to prevent future fatalities.

2. Vaginal Injuries After Consensual Versus Nonconsensual Sexual Intercourse In a Community-Based Population

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Objectives: The spectrum of vaginal injuries from coitus can range from minor superficial trauma to life-threatening laceration or perforation. There is limited data involving the evaluation of patients with nonobstetric vaginal lacerations—almost all previous reports are case studies. The goal of this study was to describe the predisposing factors, injury patterns and treatment in women presenting with vaginal laceration due to consensual versus nonconsensual sexual intercourse.

Methods: Retrospective analysis of adult females with vaginal lacerations due to sexual intercourse in a cohort of patients who presented to the emergency departments at three urban United States academic medical centers, two rural community hospitals, as well as a sexual assault clinic. Over a four-year study period, all patients were examined by board-certified emergency physicians or forensic nurses, trained to perform medicolegal examinations using colposcopy with nuclear staining and digital photography. Demographics, assault characteristics and injury patterns were recorded using a standardized classification system. The main outcome variable was the frequency of severe vaginal lacerations (those requiring repair) in women presenting for treatment following consensual (CSI) versus nonconsensual sexual intercourse (NCSI).

Results: Four hundred twenty-seven cases met the inclusion criteria of the study; 65 (15%) reported CSI and 369 (85%) reported NCSI. Both groups were comparable in terms of age, ethnicity, time to physical examination, alcohol/drug use, marital status and prior sexual intercourse experience. NCSI subjects had a greater number of mean vaginal lacerations (1.7 vs. 1.1, $p<0.001$), smaller injuries (1.1cm vs. 4.1cm, $p<0.001$) which were generally located on the posterior vaginal wall (83% vs. 69%, $p=0.01$). NCSI vaginal lacerations were all superficial and did not require sutures. In contrast, 39% of CSI subjects (25/65) had lacerations sutured in the ED; three patients presented with hemorrhagic shock and required operative repair. Predisposing factors for vaginal lacerations were documented in 78% of CSI patients.

Conclusion: In this community-based population, severe vaginal lacerations were documented in women following consensual intercourse. A number of predisposing and etiologic factors may account for such injuries. Vaginal lacerations following sexual assault were more common but superficial in nature.

3. Does Chest CT Detect Clinically Significant Injuries Missed on Chest X-rays in Blunt Trauma Patients?

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Background: Although computed tomography (CT) has been shown to detect more injuries than plain radiography in blunt trauma patients, it is unclear whether these injuries truly change patient management.

Objectives: We sought to determine whether findings seen on chest CT [but not on chest radiograph (CXR)] result in significant changes in management.

Methods: The study was approved by human subjects committee. At an urban Level I trauma center, blunt trauma victims over 14-years-old who received emergency department chest imaging as part of their evaluation were enrolled. Significant intrathoracic injury (SITI) was defined as any of the following injuries on official radiology reports: pneumothorax, hemothorax, mediastinal hematoma, pneumomediastinum, sternal fracture, aortic injury, ruptured diaphragm, two or more rib fractures or pulmonary contusion. An expert panel, consisting of two emergency medicine attending physicians and an attending trauma surgeon, determined a priori the interventions that constituted significant change in patient management.

Results: Of the 1712 subjects were enrolled, 1435 (83.8%) patients had a CXR alone and 277 (16.2%) had CXR and CT. 10% (172) of all subjects were determined to have SITI: 20.9% on CXR alone, 28.5% on CT alone and 49.4% on both CXR and CT. In 17.7% of cases in which chest CT was performed, SITI was detected that was not seen on CXR: 28 multiple rib fractures, 16 pulmonary contusions, nine pneumothoraces, eight sternal fractures and one hemothorax. Four of these resulted in changes management: Two patients had chest tube placements and two patients were provided incentive spirometers for multiple rib fractures. Overall, chest CT led to a change in patient management in 1.4% (95% CI) of cases in which it was performed.

Conclusion: Although chest CT frequently detects injuries missed on CXR in blunt trauma patients, it rarely changes patient management.

HONORABLE MENTION FOR 2010-2011

Diagnostic Accuracy of Venous Blood Gas Electrolytes for the Diagnosis of Diabetic Ketoacidosis in the Emergency Department

Marc Probst, Michael Menchine, MD, MPH, Chad Agy C, Dianne Bach, Sanjay Arora, MD

University of Southern California, Los Angeles, CA

Predictors for Asthma Revisits in a Pediatric Emergency Department

William A. Stone Jr, MD, Muhammed Waseem, MD, Mark Leber, MD

Lincoln Medical and Mental Health Center, Bronx, NY

Motor Vehicle Collision in Relation to the Proximity of Electronic Billboard in a Large Urban Setting

Sam Cooper, MD, Craig L. Anderson, MPH, PhD, Camille Ferrer, Stacy Hata, Shahram Lotfipour MD, MPH, Bharath Chakravarthy, MD, MPH

University of California Irvine Medical Center, Orange, CA

The Effect of a Computerized Patient Care Report System on Physical Exam Documentation by a Collegiate BLS EMS Organization

Robert J. Katzer, MD, Samuel Adelman EMT, David J. Barton EMT, Sophie Clark EMT, Elizabeth L. Seaman EMT, Korin B. Hudson, MD, NREMT-P

Georgetown University/Washington Hospital Center

Correlating IVC Measurements with Intravascular Changes at Three Measurement Sites

Daniel Haase, MD, Shannon Gust, MD, Teresa Wu, MD, Kai-Ning Kohr, BS, MPH, David Drachman, PhD

Maricopa Medical Center, Phoenix, AZ

Do Emergency Physicians Order More Abdominal CT Scans when a Pediatric Surgery Service Is not Available?

Viraj S. Lakdawala, MD, Muhammed Waseem, MD

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