concentrations occur following an ACL injury that seems confined to the injured joint and is associated with cartilage damage. Improving the lubricating capacity of SF may provide chondroprotection of injured joints.

352 Prospective Validation of the Surgical Trauma Alert Classification (STAC) Scoring System in Predicting Major Trauma Resuscitation

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The American College of Surgeons (ACS) mandates immediate surgical presence in Code I and II traumas. Overuse of trauma surgeons in response to nonoperative trauma stresses on-call hospital resources. The current ACS criteria identifying Code I and II traumas is consensus (not evidence) based. STAC is a previously described, retrospectively developed trauma scoring system (Ann Emg Med, Sept 2005) assigning a predetermined numerical value to each element in ACS trauma criteria that may accurately predict the need for major resuscitation.
Objectives: To prospectively compare STAC and ACS prediction for major resuscitation.
Methods: A prospective observational ongoing study with 65 consecutive ACS Code I and II traumas at an Urban teaching trauma center (85,000/yr). On arrival, a STAC score was assigned given ACS activation criteria. Primary endpoints were defined as major resuscitation (MajorResus = OR in first 6 hrs, ICU disposition, or death in ED); and no need for major resuscitation (NoResus = no OR with disposition to the floor, observation or home from the ED).
Results: Of the 65 ACS Code I and II traumas (40% penetrating/60% blunt), only 34% (22/65) met criteria for MajorResus (12 OR in 6 hrs, 8 ICU, and 2 died in ED). STAC score identified 95% (21/22) MajorResus patients (1 pediatric pt with post-traumatic seizure observed overnight in the ICU, was not identified by STAC), with a 96% Sensitivity, 81% specificity, 97% NPV and 72% PPV ($p < .0005$). The ACS Code 1 criteria identified 45% (10/22) MajorResus traumas (Sensitivity 71%, Specificity 77%, NPV 91% and PPV 46%) ($p < .003$). In addition, the STAC score accurately predicted 84% (36/43) of the NoResus patients activated by ACS criteria.
Conclusions: STAC more accurately predicted high-risk traumas needing MajorResus and identified low risk NoResus traumas compared to the current ACS Code I and II criteria. The STAC scoring system may be a more appropriate methodology in predicting need for major resuscitation in trauma patients.

353 Incidence of Nephropathy after Intravenous Contrast in ED Trauma Patients

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Objectives: IV radiocontrast agents may cause nephrotoxicity, and risk is increased in patients with advanced age, pre-existing renal disease, CHF, diabetes, or hypertension. Trauma patients, who typically receive IV contrast even when these factors are potentially present, may thus be at increased risk for contrast-induced nephropathy (CIN). We sought to determine the incidence of CIN in ED trauma patients who received IV contrast.
Methods: This was a retrospective study of 1000 consecutive ED trauma patients treated at a Level-1 Trauma Center from Jan to Sept 2003. We included all patients who had an ED CT scan with IV contrast, creatinine (Cr) level within 1 hr of contrast, and a second blood draw at least 12 hr after contrast. 378/1000 met these criteria. CIN was defined as a 25% increase from baseline Cr or an absolute increase of 0.5 mg/dL.
Results: 18 of 378 (5%) patients developed CIN. Mean hospital length of stay was 11.4 d for those with CIN, vs. 7.9 d for non-CIN patients. Incidence of CIN was significantly increased with age > 40 (OR 9.7), baseline renal insufficiency (OR 14.2), or history of CHF (OR 9.1), diabetes (OR 3.8), or hypertension (OR 3.8). No CIN patient had hypotension in the ED. All CIN patients had at least one of the predefined risk factors. Ten of the 18 (56%) returned to their baseline Cr in the hospital. Using a less conservative definition of CIN (Cr rise of 50% or 0.5 mg/dL), only 12 patients (3%) developed CIN. No patients had initiation of dialysis, and there were no deaths attributable to CIN.
Conclusions: In this selected group of ED trauma patients who received IV contrast, we confirmed a modest increase in the risk of CIN with advanced age, pre-existing renal disease, CHF, diabetes, or hypertension. Trauma patients without a history of these risk factors may not require further screening before receiving IV contrast.

354 Repeated Thoracic Discharges from a Stun Device

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Background: Stun guns or Electromuscular Incapacitation Devices (EIDs) generate between 25,000 and 250,000 volts and can be discharged continuously for as long as 5-10 minutes. In the US, over 200,000 individuals have been exposed to discharges from the most common type of EID used. EIDs are being used increasingly despite a lack of objective laboratory data describing the physiological effects and safety of these devices. An increasing amount of morbidity, and even death, is associated with EID use. We hypothesized that exposure to thoracic EID discharges in a model animal system would induce clinically significant acidosis and cardiac arrhythmia.
Methods: Ten Yucatan mini-pigs, 6 experimentals and 4 sham controls, were anesthetized with ketamine, xylazine, and glycopyrollate. Experimentals were exposed to two 40 sec discharges from an EID device (MK63, Aegis Indus.) over the left thorax. EKGs, troponin I, blood

gases, and lactate levels were obtained pre-exposure, at 5, 15, 30, 60 min, 24, 48 and 72 hrs post-discharge.
Results: No acute or delayed cardiac arrhythmias were seen. Heart rate was not affected significantly ($p > 0.05$). A subclinical increase in troponin I was seen at 24 hrs post-discharge (0.040 ± 0.030 ng/ml, mean $\pm$ SEM, $p > 0.05$). Central venous blood pH (7.432 ± 0.014) and pCO2 (36.1 ± 0.9 mmHg) were not changed significantly ($p > 0.05$) during the 60 min post-discharge period. A moderate, significant increase in lactate occurred in the 5 min post-discharge group (4.9 ± 0.3 mmol/L, $p = 0.0179$). All blood chemistry and vital signs were normal at 24, 48, and 72 hrs post-discharge.
Conclusions: Although significant changes in some parameters were seen, these changes were small and of little clinical significance. Lengthy EID exposures did not cause extreme acidosis or cardiac arrhythmias. These findings may differ from those seen with other EID devices due to the unique MK63 waveform characteristics or to specific characteristics of the model systems.

355 Does Tourniquet Time Affect Venous Lactate?

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Introduction: Lactate is used to diagnose early or occult tissue injury in emergency department patients. Elevated lactate levels prompt further diagnostics and interventions. Many physicians believe that venous lactate can be falsely elevated if a tourniquet has been applied for a protracted length of time; for that reason some advocate routine arterial sampling. However, the effect of tourniquet time on venous lactate has not been studied.
Objectives: To test if prolonged tourniquet time would elevate venous lactate levels in healthy subjects.
Methods: Design: in an IRB-approved experiment, an automated tourniquet was inflated to 60 mmHg on each subject's arm. To simulate normal and extreme conditions, samples were drawn at one minute and ten minutes after inflation. The subjects consisted of thirteen healthy adults; the average age was 32 years old, 53% were male, 69% White. Exclusion criteria included age under 18, heart/lung disease, history of deep venous thrombosis, vascular disease, dialysis dependency, known clotting disorder, recent injury or strenuous activity (in previous 12 hours), and drug use in the past week.
Results: The average venous lactate level after one minute of tourniquet time was 1.76 mmol/L (normal range 0.8-2.2 mmol/L). After ten minutes the average was 1.90 mmol/L. There was no statistically significant change in the lactate level. Four subjects had elevated lactate levels after one minute (average 2.98 mmol/L).
Conclusions: In healthy adults, protracted tourniquet time did not elevate venous lactate. Clinicians should not assume elevated lactate is the result of tourniquet time. Four subjects were found to have elevation after only one minute of tourniquet use. This may represent a subset of patients who rapidly produce lactic acid, with no underlying tissue injury. Further research is needed to explore that possibility, and delineate what, if any, difference arterial versus venous lactate could have in reducing falsely elevated results.

356 A Simple Scoring System Derived from FAST Findings and Vital Signs Predicts the Need for Urgent Laparotomy in Patients with Blunt Abdominal Trauma

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Objectives: The FAST exam is routinely used to identify intraperitoneal free fluid in victims of blunt trauma. For patients with positive FAST exams, the decision to forego further imaging and proceed directly to laparotomy is highly physician dependent. We set out to derive a simple scoring system utilizing both ultrasound findings and immediately available physiologic data that would predict which patients require a laparotomy.
Methods: We performed a prospective observational study on victims of blunt trauma who presented to our level one trauma center. A previously published ultrasound scoring scale of 0-8 was utilized to score FAST exams. 20 variables including pre-hospital and ED vital signs and lab values were collected. Records were reviewed by a trauma surgeon to determine which subjects required an urgent laparotomy. Logistic regression analysis was used to determine which combination of variables had the strongest correlation with the need for laparotomy. A simple scoring scale was derived to predict the need for laparotomy.
Results: 1,384 patients were enrolled of whom 40 required urgent laparotomy. Combining ultrasound score, ED pulse, and ED blood pressure in a three variable model produced an AUC of 0.852. A scoring system was derived with a minimum score of 0 and a maximum of 6. Patients with a score of >3 had an odds ratio of 35.1 (95% CI = 17.6 to 70.3) for requiring laparotomy. Applying this scoring system to our database resulted in a specificity of 0.969.

Variable	Score
Ultrasound Score	
0	0
1	2
>1	3
Pulse	
<120	0
≥120	2
BP	
<90	1
≥90	0

Conclusions: While the FAST exam easily identifies free intraperitoneal fluid in blunt trauma patients, it often fails to convince our surgical colleagues to take patients directly to the operating room. Our simple scoring system provides a tool that combines FAST findings with