Corporation, San Antonio, TX, USA) was placed in the proximal humerus and two sets of IO blood samples were obtained; one following 2ml of marrow/blood waste, and one following 6ml of waste. All three samples sets were sent to a reference laboratory for chemistry profile and complete blood count (CBC) analysis. Means for each value for the three blood draws (designated IV, IO-1, and IO-2) were calculated and compared with the intravascular (IV) blood serving as a control for the IO draws.

Results: For IO-1, mean red blood cells (RBC), hemoglobin (Hgb), hematocrit, glucose, blood urea nitrogen (BUN), sodium, chloride, total protein and albumin levels were within 5% of mean values from IV blood. For IO-2, mean Hgb, glucose, BUN, sodium, chloride, total protein and albumin levels were within 5% of mean values from IV blood. For both IO samples, most other values were within 10% of IV blood.

Conclusion: In the first study of its kind in 15 years, we have found that the intraosseous space is a reliable source for blood used for laboratory analysis commonly performed in emergency medicine, including CBC and chemistry profile. Results may be moderately reliable for carbon dioxide, but unreliable for WBC counts that appear to be elevated and platelets counts that appear lower.

## 194 The Use of a Subcutaneous Insulin Aspart Protocol for the Treatment of Hyperglycemia in the Emergency Department: A Randomized Clinical Trial

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Study Objective: Emergency physicians have a unique and challenging interaction with patients who have diabetes. Such patients commonly present with significant hyperglycemia. Patients presenting with a specific diabetes-associated illness routinely have the complaint directly addressed and treated. However, when patients present with a non-diabetic chief complaint, there are no established protocols for how best to address the common issue of hyperglycemia. We prospectively evaluated a SQ insulin protocol for use in the emergency department (ED) in patients with known Type 2 diabetes mellitus (DM) and hyperglycemia.

Methods: Patients with Type 2 diabetes had a point-of-care blood glucose (BG) measured soon after ED presentation; those with BG >200mg/dL were randomized to an intervention group (INT) vs. usual care (UC). All INT subjects (n=66) received subcutaneous insulin aspart (0.05 U/kg for BG 200–299mg/dL, 0.1 U/kg for BG 300–399mg/dL, 0.15 U/kg for BG ≥ 400mg/dL) every 2 hours until BG <200 mg/dL. Insulin aspart was chosen for this protocol because its onset of action is 30 minutes and it can be redosed every 2 hours, thus making it easy for implementation in a busy ED. Emergency physicians treated UC subjects (n=72) at their discretion, and 49% did not receive insulin. Subsequent blood glucose was measured every 2 hours in the ED until discharge home or hospital admission.

Results: Mean initial ED BG for all subjects enrolled in the study was 299 ±78 mg/dL. At ED discharge either to home or the hospital, the mean BG decreased by 76 ±67 mg/dL with INT, and by 82 ±77 mg/dL with UC (ns). 47 UC subjects were admitted to the hospital, and 43% of those had received SQ insulin aspart in the ED, while 40% of INT subjects were admitted. When the first BG after admission to the hospital was assessed, however, the mean decreases from the first ED BG were greater: UC subjects who received insulin decreased 131 ±104 mg/dL, while UC subjects who did not receive insulin only decreased 33 ±67 mg/dL (p= 0.04). INT subjects decreased 104 ±80 mg/dL. Only 1 subject had a BG reading less than 100 mg/dL (76 mg/dL). Mean ED length of stay was similar, INT 5.4 ±1.8 hours, UC 4.8 ±1.8 hours (ns).

Conclusion: A weight-based protocol for dosing SQ insulin aspart every 2 hours in the ED for the treatment of hyperglycemia in patients with Type 2 diabetes was safe and effective. This protocol was easy for physicians to determine insulin dosing and nursing to administer without significantly increasing ED length of stay. The insulin treatment of ED patients with hyperglycemia achieves rapid and significant lowering of BG. A higher unit per kg insulin dosing algorithm can achieve greater decreases in BG; however, our previous pilot study found an excess of hypoglycemia. Thus these doses seem optimal. Further study is required to delineate possible benefits to patients who are subsequently admitted to the hospital.

## 195 Refusals of Medical Aid in the Out-of-Hospital Setting

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Study Objective: Our research examined the characteristics of both patients and EMTs who are involved in the Refusal of Medical Aid (RMAs.) As well, we studied the timing of RMAs both by shift and within an individual shift.

Methods: The study was carried out using data from the New York Hospital Queens (NYHQ) ambulance service, which is a large urban ambulance service providing 9-1-1 basic life support and advanced life support care. This was a retrospective chart review of all patient charts in which the patient RMA'd for the time period 8/1/05 through 7/31/06, a one-year period. These patients were then compared to a control set of patients that was created by reviewing every chart in a 24-hour period for ten randomly selected days within the same one-year period. The data was obtained from the patient care reports that are scanned by NYHQ EMTs into HealthEMS database. Data analysis was performed using SAS 9.1 for Windows. For continuous variables, the Student's t test was used to test for differences between the control and research groups. For categorical variables, the Chi-Square test was used and the Fisher's Exact test was used if cell counts were less than 5.

Results: The RMA data set had a total of 238 patients, 58% female and 42% male, with a mean age of 56. The control data set had a total of 303 patients, 53% female and 47% male, with a mean age of 53. There was no difference in the sex distribution between the RMA and control groups ($P <= 0.2965$.) There was also no difference in average age of the RMA and control patients on the day and evening shifts ($P = 0.1764$ & $0.0711$). However, on the night shift the patients in the RMA group were significantly younger - mean age of 47 in the research group versus 55 in the control group ($P = 0.0160$).

The EMS team consists of two EMTs. The presence of a male on the team increased the likelihood of an RMA. The EMT teams in the RMA set were 0.42% female/female, 7.1% male/female, and 92.4% male/male. The EMT teams in the control set were 4.6% female/female, 34.7% male/female, and 60.7% male/male. The higher percentage of male EMTs in the RMA set achieved statistical significance ($P < 0.0001$). The sex of the EMT team versus the sex of the patient had no effect on increasing RMAs ($P = 0.9936$).

The patient's chief complaint was significantly different in the RMA versus control groups. The RMA group had more neurological, psychiatric, and social chief complaints. ($P < 0.0001$) This difference holds true for both day and evening shifts ($P = 0.0003$, $0.0001$); however, on night shifts there is no significant difference in chief complaints ($P = 0.0812$).

In the RMA group, the shifts were 35.7% day, 41.6% evening, and 22.7% night. In the control group, the shifts were 51% day, 30% evening, and 18.5% night. RMAs were more common on the evening and night shifts ($P = 0.0011$).

The calls were also broken down as to whether occurring in the first two hours of the shift, the middle four, or the last two hours. There was no difference in the frequency of RMAs based on the timing within the shift. ($P = 0.5488$).

Conclusions: The call most likely to generate an RMA contains the following set of characteristics: a younger patient with a chief complaint falling out of the usual medical categories like trauma or cardiac, two male EMTs on the team, and an evening or night shift. The commonly held perception that RMAs are more common at the end of a shift (to avoid working late) was proven to be untrue.

## 196 Intubation Success Rates in Helicopter Emergency Medical Services: A Prospective Multicenter Analysis

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Study Objectives: The Critical Care Transport Collaborative Outcome Research Effort (CCT-CORE) Airway Study is a multicenter analysis of air medical programs' performance on airway management variables defined by the National Association of Emergency Medical Services Physicians (NAEMSP). This study examines the success rate of endotracheal intubation (ETI) in air transport programs across a variety of settings. It also examines whether there are lower success rates for air medical crews attempting ETI in patients in whom ETI by non-air medical providers has already failed.

Methods: This was a prospective consecutive-case series of patients undergoing air medical transport in whom advanced airway management was attempted. There were 11 participating sites, and all crews had access to RSI drugs. Eligible subjects included all patients in whom air transport crews attempted advanced airway management. Prospectively defined data points were collected and entered into a secure Web-based data entry system. The primary analysis for this report was descriptive, focusing on ETI success rates (reported with exact binomial 95%