Table 1: Preliminary quality measurement framework for acute psychiatric care*

	Structural Measures	Process Measures	Outcome Measures
Evaluation & Risk Stratification	Presence of a triage protocol for patients with behavioral health chief complaints Presence of a protocol for assessing suicidality in patients Presence of a protocol for screening for lethal means for patients who screen positive for suicidality Access to behavioral health specialist for initial evaluation	Door to diagnostic evaluation by primary ED clinician (physician or licensed advanced practice provider) Family involvement (social support identified/contacted) Admission screening for violence risk, substance use, and intimate partner violence Documentation of current medications at assessment (excluded if patient cannot provide history) Screening for Pregnancy Variability in diagnostic evaluation (laboratory orders)	Variation in involuntary holds or number of involuntary holds
Acute Stabilization	Presence of a protocol for acute agitation management Presence of a designated behavioral health treatment space in the ED or affiliated with the ED Presence of ED staff training modules for de-escalation of acute agitation	Hours of physical restraint use Proportion of behavioral health patients physically restrained Proportion of patients requiring chemical sedation (oral, IM, and IV) Proportion of sedating medication given intramuscularly Initiation of new treatment (scheduled psychiatric medications) during ED stay Continuation of outpatient psychiatric medications during ED stay Timeliness of medication administered	Patient injury during restraint Incidence of workplace violence with injury related to care of behavioral health patients Unexpected escalation requiring chemical sedation or physical restraint after the first hour of ED stay Change in patient reported outcomes Reduction in agitation, risk adjusted
Disposition & Care Transition	Presence of a prearranged transfer protocol for acute behavioral emergencies Presence of formal relationship with inpatient psychiatric units	Median Time from ED Arrival to ED Departure for Discharged ED psychiatric patients Median admit decision time to ED departure time for admitted psychiatric patients (disease specific) Referrals for substance abuse treatment for dually diagnosed patients	Unscheduled return visits (admitted vs. not admitted) Follow-up after emergency department visit for psychiatric illness (disease specific) Community dispositions, risk adjusted (disease specific) Patient who returns to the ED after disposition to inpatient psychiatric unit Number of suicide related deaths within 30 days of discharge Risk adjusted admission rate to inpatient psychiatric units
Boarding & Observation	Presence of a psychiatric observation unit	Hours in the hallway for evaluation and treatment Hours of constant observer Treatment for substance use disorder provided	Proportion of patients whose final disposition was changed from the time of initial disposition (from the start of boarding process)

*This preliminary quality measurement framework will be finalized by the time of ACEP 2020 presentation
ED: Emergency Department; IM: Intramuscular; IV: Intravenous

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112 Evaluation of MicroMend Wound Closure Device in Repairing Skin Lacerations

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Study Objective: Sutures, staples, tissue adhesives, and bandages are used for simple laceration closure, but they have limitations. Sutures and staples are painful and require clinic visits to remove. Tissue adhesives and bandages can cause inflammation and carry a risk of wound dehiscence. Therefore, there is an unmet need for better skin closure products. microMend® is a novel wound closure device that consists of microstaple arrays attached to an adhesive backing that is the size of a butterfly closure. This study aims to evaluate the feasibility of simple laceration closure using microMend in the emergency department (ED).

Method: This was an open label, single-arm study conducted at two EDs within a large urban academic medical center. Eligible participants were ≥18 years old. After informed consent, one device was applied for every 1-1.5 cm of wound length. Closure was performed by physicians and advanced practice providers. Device removal occurred on Days 5-7 for facial lacerations and Days 7-10 for other locations. A provider satisfaction survey was performed after device application at baseline ED visit. Follow-up assessments, participant satisfaction surveys and photographs of the wound were performed at Days 0, 10, 30 and 90. Photographs were rated by two independent plastic surgeons using a 100-mm visual analog scale (VAS) (0 = worst possible scar, 100 = best possible scar) and a wound evaluation scale (WES) assessing 6 clinical variables (the maximum score is 6). Descriptive statistics are reported.

Results: Thirty-one patients were enrolled in the study: 48% were female, the median age was 42 (IQR 30.5-58), and the median BMI was 27 (IQR 22-29.4); 68% non-Hispanic white, 19% Hispanic white, 10% non-Hispanic African American, 3% other. The median wound length was 2 cm (IQR 1.6-2.5). Ninety percent of the wounds were closed with 1 or 2 devices. The median pain score with application of the devices was 1 (IQR 0 - 10) on a 0-100 mm VAS. Mean time for device application was 89 ± 82 seconds. Local anesthesia was used in 29% of participants (usually for placement of deep sutures) and 97% of providers rated the ease of device application as good or excellent. In addition, 30 of 31 patients (97%) rated the overall device assessment as good or excellent on the Day 10 and Day 30 follow-ups, and 100% of patients rated the overall device assessment as good or excellent on the Day 90 follow-up. Two independent plastic surgeons evaluated wound appearance. At Day 90, the mean VAS and WES scores were 83 ± 15 mm and 5 ± 1, respectively. The agreement between plastic surgeons for these measurements was 82%; 61% of participants had an average WES of 5 or more. Deeper wounds tended to have lower scores. There were no serious adverse events.

Conclusions: Overall, microMend is an acceptable alternative for skin closure in the ED. Nearly all participants and providers rated high levels of satisfaction during application and removal. A majority of participants also had satisfactory cosmetic results at Day 90. Advantages of microMend include ease of use, short application time, low patient-reported pain upon application, and potentially decreased need for local anesthesia. Variability in cosmesis may be dependent on patient, wound, and provider factors. Future studies could evaluate the ability for patients to remove the device at home. Randomized controlled trials are needed to compare microMend to other wound closure methods.

113 Bier Block versus Sedation: A Comparison of Patient Characteristics and Emergency Department Metrics in Pediatric Forearm Reduction

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Study Objectives: Among children presenting to the pediatric emergency department with a forearm fracture requiring closed reduction, the primary objective was to compare the characteristics of children selected for Bier block versus procedural sedation. The secondary objective was to compare procedure-related outcomes for Bier block versus procedural sedation.

Methods: Children ages 4-16 years old, who presented to a single tertiary-care pediatric emergency department (PED) from 01/2013 to 06/2019 with a forearm fracture requiring reduction were eligible for inclusion in this retrospective cohort study if they underwent Bier block or procedural sedation. Patients with open fractures were excluded. Characteristics of interest included population variables, injury types, and visit-timing factors. Procedure-related outcomes included length of stay, pain scores during and after the procedure, procedure success rates, hospitalization rates and unplanned return visits.

Results: 260 children were eligible for inclusion, of whom 177 (68%) underwent Bier Block and 83 (32%) underwent procedural sedation. Children selected for Bier block were more likely to be older (mean 9.5 +/- 3.1 vs. 8.0 +/- 3.4 years, $p<0.001$), male (128/177[72%] versus 48/83[58%], $p=0.020$), have fractures involving the radius only (39/177 [22%] versus 8/83[9.6%], $p=0.048$) and arrive during the weekend (65/177[37%] versus 20/83 [24%], $p=0.043$) compared with children receiving procedural sedation. However, no characteristics were shown to be predictive of procedure selection based upon a binary regression model (Hosmer-Lemeshow goodness of fit $X^2=5.069$ and $p=0.750$, Nagelkerke $R^2 = 0.359$). In addition, no differences were identified in procedure selection based on based on race, mechanism of injury, pre-procedure pain scores, presence of underlying medical conditions, hour of arrival, comorbid injuries, or fracture morphology. PED length of stay (220.7 +/- 98.0 vs. 304.0 +/- 134.3 min) and time from procedure to disposition (60.8 +/- 31.9 vs. 91.6 +/- 88.4) were shorter for children who underwent Bier block. Pain scores, reduction success rate, hospitalization rate, and unplanned return visits were similar in both groups.

Conclusion: There were differences in the characteristics of children selected for Bier block versus procedural sedation for forearm fracture reduction, but these differences were not predictive of procedure selection. Length of stay was shorter for patients who underwent Bier block, but other procedure-related outcomes were similar.

114 Effect of Clinical Decision Support on Head Computed Tomography for Children With Minor Head Trauma

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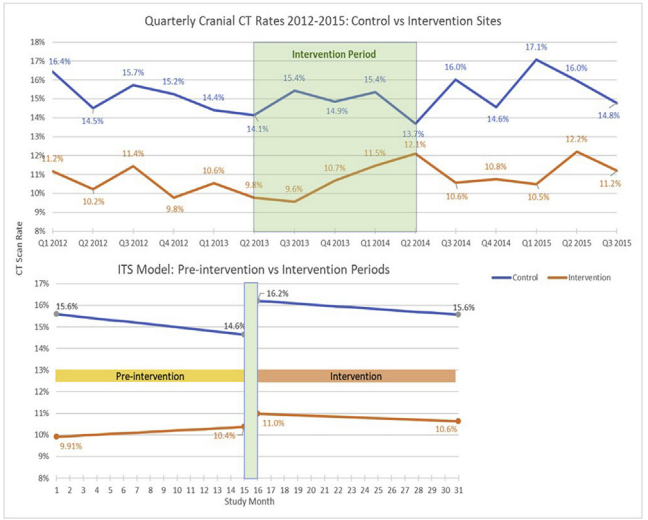
Study Objective: Incorporation of an emergency department (ED) clinical decision support system (CDSS) into the electronic health record for the evaluation of children with blunt head trauma has been shown to safely reduce cranial computed tomography (CT) use in a mixed academic/community ED setting. However, early analyses did not evaluate the broader impact of the CDSS intervention within a large integrated health care system. We aimed to compare changes in ED CT rates and length of stay (LOS)

before, during and after the CDSS implementation among children with minor head trauma across one large system with low baseline CT rates. We compared EDs with and without access to a CDSS tool that incorporated the Pediatric Emergency Care Applied Research Network (PECARN) minor blunt head trauma prediction rules.

Methods: We included children < 18 years old presenting to 21 community EDs between 2012-2015 with minor blunt head trauma, defined by a previously validated matrix of ED chief complaints and diagnoses. Seven EDs participated in a non-randomized CDSS intervention trial between 4/2013 and 7/2014 in which enrolling providers received computerized decision support for children with minor blunt head trauma (Glasgow Coma Scale scores of 14-15). This included patient-level risk estimates of clinically important traumatic brain injury (TBI) defined by the PECARN study. Fourteen EDs did not receive the intervention and served as a comparison group. To assess CDSS sustainability and diffusion, we examined CT rates and ED LOS across CDSS and control sites over 3 time periods: pre-intervention (12 months), intervention (15 months) and post-intervention (15 months) using interrupted time series (ITS) analyses. We excluded those with GCS scores < 14, a TBI diagnosis in the last year and a CT within 24 hours prior to the ED visit.

Results: There were 50,195 eligible patient ED encounters. The CT rates were as follows: pre-intervention: CDSS EDs 10.7% (95% CI: 10.0-11.3) vs. control 15.5% (95% CI: 14.8-16.2); intervention: CDSS EDs 10.7% (95% CI: 9.9-11.6) vs. control 14.7% (95% CI: 14.1-15.3); post-intervention: CDSS EDs 11.0% (95% CI: 10.5-11.6) vs. control 15.7% (95% CI: 14.9-16.5). The CDSS EDs started with and maintained a significantly lower CT rate compared to control EDs across study time periods. There was significant variation across EDs: CT rates ranged from 7.6-14.1% at CDSS sites and 7.8-21.3% at control sites. In ITS models, we found no significant difference in CT rate changes between the pre-intervention vs. intervention and intervention vs. post-intervention periods. We did not find clinically meaningful changes in ED LOS over the study period.

Conclusion: CT rates for children with minor blunt head trauma were stable in this community ED health system from 2012-2015. Unexpected baseline practice pattern differences at control versus CDSS facilities confounded our CT comparison and suggest that the CDSS sites may have already been close to a safe CT "floor" rate prior to CDSS implementation.



115 A Retrospective Review of the Clinical Significance of Knee Effusions on X-ray Imaging and the Relation to Occult Tibial Plateau Fractures

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Study Objectives: Tibial plateau fractures can be difficult to visualize on x-rays and in the absence of routine use of advanced imaging modalities such as CT or MRI, they can be missed. Diagnosing this fracture early is critical and the delay in treatment can result in the tibia remaining in a subluxed position. This can lead to abnormal loading on the joint, resulting in early degeneration, deformity, and limitation of knee movements. The primary objective of this study was to determine if there is a correlation between effusions viewed on initial knee x-ray and occult tibial plateau fractures. Secondary objectives evaluated for associations between fractures and patient demographics, mechanism of injury, co-morbidities, and surgery rates.

Methods: This was a retrospective chart review conducted at a tertiary academic hospital with 64,000 annual ED visits and a second satellite facility with nearly 30,000 ED visits. ICD10 coding were used to extract all patients from the electronic medical record from 9/1/2012 to 6/30/2019, with the diagnosis of tibial plateau fracture. The medical records were individually reviewed for the presence of tibial plateau fractures and the imaging obtained. Specifically, the presence or absence of knee effusions on x-rays, in which the fracture was not initially seen, but subsequently confirmed on CT or MRI. Additional recorded information included patient demographics, trauma activations, surgery rates, fall from a height, and co-morbidities. Descriptive statistics were used to summarize demographic and clinical characteristics of the patients. Fisher's exact test was used to look at the association between diagnosis of fracture from plain x-ray and detection of effusion on x-ray. Additional analysis was done to look at the association of patient demographics with need for surgery. Results were reported as odds ratios and 95% CIs. Analyses were done using SAS, Version 9.4. $P<0.05$ was considered statistically significant.

Results: 321 tibial plateau fracture identified per x-ray, CT, or MRI. 50% were female and the mean age was 53 years old. There were 84 occult fractures, which by definition, did not reveal fracture on x-ray but ultimately confirmed on CT or MRI. There was a statistically significant association between the presence of an effusion and non-occult tibial plateau fracture (OR: 2.93, 95% CI: 1.20, 7.19; $p=0.019$). Statistically significant predictors of undergoing surgical repair included male sex (OR: 2.91, 95% CI:1.70, 5.01; $p=0.0001$), fall from a height (OR: 3.66, 95% CI:2.14, 6.26; $p<0.0001$), and fracture visualized on the initial x-ray (OR: 10.66, 95% CI:5.17, 21.98; $p<0.0001$)

Conclusion: The presence of an effusion on initial x-ray is more predictive of a non-occult tibial plateau fracture versus an occult one. Individuals of male sex, suffered injury due to fall from a height, or the fracture was visualized on the initial x-ray, were more likely to undergo surgical repair for their tibial plateau fracture.

116 Associations of Emergency Department Sedation and Analgesia and Hospital Outcomes in Mechanically Ventilated Patients

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Study Objectives: Sedation and analgesia are vital components of care provided to patients in the emergency department (ED) and intensive care unit (ICU) settings; they are largely necessary for alleviating pain, reducing agitation, and aiding patient synchrony with the ventilator. However, several prior studies have begun to shed light on the deleterious consequences of deep analgosedation, which take effect starting in the immediate post-intubation period in the ED, and carry over into the ICU. Yet, the most recent literature has been conflicting with regard to the impact of sedation on mortality.

Study Objectives: Thus, the authors of this study sought to further investigate the relationship between depth of sedation and mortality, immediately following ED intubation and within 24 hours of ICU admission.

Methods: The study was a retrospective cohort study of patients 18 years or older presenting to the Brigham and Women's Hospital (BWH) emergency department requiring mechanical ventilation from January 1, 2016 to December 31, 2017. Data were obtained from the National Emergency Airway Registry (NEAR), a multi-center observational intubation registry for patients presenting during this timeframe. Patients who were intubated at a referring hospital, died in the ED, or required chronic mechanical ventilation prior to presentation were excluded from the study. We conducted additional chart review and analysis to supplement the NEAR data. Patients were classified as receiving deep sedation or light sedation based upon the Richmond