

Table 2. Emergency Milestone Sub-competencies Most Difficult to Assess Using Traditional Non-Simulation Methods

Rank	MOST DIFFICULT to assess using traditional NON-simulation	Percentage
1	Quality Improvement (SBP2)	71.88%
2	Physician Role in Health Care Systems (SBP4)	62.50%
3	System Navigation for Patient-Centered Care (SBP3)	50.00%
4	Reflective Practice and Commitment to Personal Growth (PLBI2)	46.88%
5	Patient Safety (SBP1)	43.75%

Abbreviations: PBLI, practice-based learning and improvement; SBP, system-based practice.

16 (P82) Predictors of Prolonged Hospital Length of Stay After Traumatic Brain Injury

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Poster Presenter: Shameeke Taylor, MD, MPH, MS

Objectives: The aim of this study was to identify factors associated with prolonged hospital length of stay (PLOS) following traumatic brain injury (TBI).

Background: For TBI survivors, recovery can be a long and arduous process with a significant number of days spent in the inpatient and rehabilitation settings.¹⁻⁶ Hospital length of stay (HLOS) after TBI is a crucial metric of injury severity, resource utilization and treatment-related costs.⁷⁻⁸ Risk factors for PLOS after TBI require further characterization as there is a dearth of literature on this important topic.⁵⁻⁶ Identification of the risk factors associated with PLOS in TBI patients may help health systems develop standards of care and facilitate early mobilization of resources, promote timely discharge and reduce healthcare costs.

Methods: De-identified patient data for individuals with diagnosed TBI who were evaluated by the trauma surgery service at a single US Level 2 academic trauma and tertiary referral center between January 2017–August 2022 were extracted from the hospital’s prospectively collected trauma registry. PLOS was defined as the 95th percentile of the in-hospital length of stay of the entire patient cohort. Patients with PLOS were compared with those without PLOS (normal HLOS). Clinical/injury factors, insurance status, and discharge disposition were analyzed. In addition, a logistic regression model was developed that examined PLOS (outcome variable) using intensive care unit (ICU) stay, Glasgow Coma Scale (GCS) score on hospital arrival, Injury Severity Score (ISS), hospital discharge disposition, use of a ventilator, in-hospital cardiac arrest, alcohol withdrawal, and unplanned intubation as predictor variables. Statistical analysis included descriptive statistics, chi square test, Wilcoxon rank-sum test and multivariate logistic regression modeling (OR; 95% CI).

Results: The threshold for PLOS was >24 days. In the cohort of 1343 patients, 77 had PLOS. PLOS was significantly associated with male gender (80% vs 64%; $P < .003$), longer mean ICU stays (16.4 vs 1.5 days; $P < .001$) higher mean ISS (18.6 vs 13.8; $P < .001$), lower mean GCS score (11.3 vs 13.7; $P < .001$) and greater mean complication burden (0.7 vs 0.1; $P < .001$). PLOS patients were more likely to have moderate/severe TBI (44% vs 14%; $P < .001$), were more likely to die in hospital (19% vs 7%; $P < .001$), be discharged to a facility (55% vs 29%; $P < .001$) and use Medicaid (36% vs 22%; $P < .005$). In terms of complications, PLOS was associated with higher rates of cardiac arrest (5% vs 0.5%; $P = 0.002$), unplanned intubations (13% vs 1%; $P < .001$), inpatient alcohol withdrawal (10% vs 2%; $P < .001$), ventilator-associated pneumonia (5% vs 0.1%; $P < .001$) and acute respiratory distress syndrome (3% vs 0.2%; $P < .02$). Both groups had similar mean ages, racial distributions, Medicare/commercial insurance use, and rates of orthopedic injuries, alcohol-related injuries, unplanned extubations, and operating room revisits. In the regression model, presence of an ICU stay (OR 2.5, CI 1.1-5.7) disposition to inpatient facility (OR 3.0 CI 1.6-5.9), ventilator use (OR 4.1, CI 2.0-8.4), unplanned intubation (OR 3.4, CI 1.1-10.5), and inpatient alcohol withdrawal (OR 3.5, CI 1.2-10.3) predicted PLOS.

Conclusion: Traumatic brain injury patients with prolonged length of stay were more likely to have severe injuries, in-hospital complications, and Medicaid insurance use and were less likely to be discharged to home. PLOS status was predicted by ICU stay, intubation, alcohol withdrawal and disposition to inpatient and post-acute care facilities. These findings have significant implications for quality improvement and resource utilization at acute care hospitals. Efforts to reduce in-hospital complications and expedite discharge to long-term facilities may reduce length of stay and accompanying costs in TBI patients. Further validation of these results is needed from larger, multicenter studies with diverse patient populations.

References: 1. Carroll, Ellen L., et al. “Mild traumatic brain injury recovery: a growth curve modelling analysis over 2 years.” *J Neurol* 267 (2020): 3223-3234. 2. Forslund, Marit V, et al. Global outcome trajectories up to 10 years after moderate to severe traumatic brain injury. *Front Neurol* 10 (2019): 219. 3. Dams-O’Connor K, et al. Functional outcome trajectories following inpatient rehabilitation for TBI in the United States: a NIDILRR TBIMS and CDC interagency collaboration. *J Head Trauma Rehabil* 35.2 (2020): 127. 4. Cullen N. Canadian healthcare perspective in traumatic brain injury rehabilitation.” *J Head Trauma Rehabil* 22.4 (2007): 214-220. 5. Yue JK, et al. “Predictors of extreme hospital length of stay after traumatic brain injury.” *World Neurosurg* 167 (2022): e998-e1005. 6. Abujaber A, et al. Predicting prolonged length of stay in patients with traumatic brain

injury: a machine learning approach. *Intell Based Med* 6 (2022): 100052. 7. Pavlov V et al. Mild traumatic brain injury in the United States: demographics, brain imaging procedures, health-care utilization and costs. *Brain inj* 33.9 (2019): 1151-1157. 8. Tardif P, et al. Hospital length of stay following admission for traumatic brain Injury in a Canadian integrated trauma system: a retrospective multicenter cohort study.” *Injury* 48.1 (2017): 94-100.

17 (O-C7) De-escalating Techniques to Reduce Tension in the Emergency Department Among Staff

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Objectives: We hypothesized that some techniques utilized by emergency department (ED) staff would be less effective than other techniques at reducing tension.

Background: Due to the unique nature of the work environment in the ED, healthcare providers and staff in the ED often adapt unique strategies to respond to periods of increased tension that can regularly occur at work. This study aimed to identify the most effective techniques used by ED staff to rapidly de-escalate tension. Tension among staff may impair performance and team cohesion; therefore, it is important to understand which techniques will effectively decrease this tension and which will not.

Methods: An online survey was administered to staff from seven separate EDs. Of 634 potential participants, 163 responses were received, representing physicians, nurses, PAs, NPs, and clinical support staff. Participants indicated whether they had experienced a period of increased tension in the ED and chose which techniques they used to de-escalate this tension. For each technique selected, participants rated perceived effectiveness at de-escalating tension on a personal level and among their healthcare team, ranging from completely effective (5) to not at all effective (1). ANOVA was used to analyze for significant differences between technique effectiveness.

Results: Of 163 participants, 152 participants (93.3%) reported experiencing a period of increased tension while working in the ED, and these responses were further analyzed for techniques used in response to tension. “Withdrawing or becoming silent” in response to tension was shown to be significantly less effective than the other techniques at reducing tension on both a personal and team level ($P < 0.001$). There were no significant differences in the perceived effectiveness of other techniques used. Humor was the most commonly reported technique (84.2% reported) while motivational speech was the least commonly reported (13.82%).

Conclusion: Withdrawing oneself from the situation was shown to be least effective at de-escalating tension. Therefore, a proactive approach to resolving tension in the ED was

shown to be more efficacious, regardless of which proactive technique was used. This data, along with the relative levels of technique effectiveness, can inform an approach to resolving tension that can be utilized by medical staff in emergency departments across the country.

18 (O-B1) A Retrospective Cohort Study to Determine the Injury Prevalence of Cervical Spine Injuries in Elderly Patients Undergoing Full Trauma CT

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Oral Presenter: John S. Batchelor, MD

Objectives: The aim of the study was to determine the prevalence of cervical spine injuries and injury patterns in elderly patients (>65 years) with low energy injuries who underwent a pan trauma computed tomography (CT).

Background: Cervical spine injuries sustained from low energy injuries or falls are often relatively occult due to the absence of significant cervical spine symptoms or pre-existing arthritis. There is some debate as to the whether the pan CT should be undertaken in all elderly fallers. Recent evidence has shown that cervical spine fragility fractures are uncommon in the elderly fallers due to a higher bone density in this region.¹ In contrast osteoarthritis of the cervical spine is common and has been shown to be a risk fracture for cervical spine fractures.²

Methods: The Emergency Department at North Manchester General Hospital automatically undertakes a pan CT in elderly patients with one or more of the following: haemodynamic instability; evidence of chest wall tenderness; evidence of respiratory compromise; multi-level spinal pain; cervical spine tenderness plus evidence of torso injury or high impact injury. The CT reports and clinical notes were reviewed of all elderly patients (over 65 years of age) who had a full trauma CT (head, neck, chest, abdomen and pelvis) over a 12-month period (September 2020–September 2021). The number of patients with cervical spine fractures and their age were recorded. The type and location of cervical spine injuries was also recorded.

Results: Sixty-six elderly patients underwent a full trauma series over the 12-month period. High-impact injuries and haemodynamic instability account for a small number of patients because the ED at North Manchester General Hospital is a non-trauma centre. The mean age of the cohort was 83.2 years; 26% (of the patients (17) in the cohort were aged 90 years or over. 39% (26) of the patients were identified to have a least one injury detected on CT; 86% (57) were due to ground level falls. Three patients out of 66 were noted to have cervical spine fractures (4.5%). One patient was an isolated C2 fracture, one patient had a C2 fracture with an associated T4 fracture, and the third patient had a C5 fracture with an