



## ARTICLE OF THE MONTH

### **Neuro-, Trauma -, or Med/Surg-ICU: Does It Matter Where Polytrauma Patients with TBI are Admitted? Secondary Analysis of AAST-MITC Decompressive Craniectomy Study.**

Lombardo S, Scalea T, Sperry J, Coimbra R, Vercruysse G, Jurkovich GJ, Nirula R. J Trauma Acute Care Surg. 2016 Dec 23. doi: 10.1097/TA.0000000000001361.

Welcome to the March 2017 installment of the SNACC Article of the Month! This month's study by Lombardo *et al* investigates whether care in a subspecialized ICU might confer a mortality benefit to polytrauma patients with traumatic brain injury.

Dr. Michael Luke James of Duke University Hospital selected this article and provided his expert commentary. Dr. James is an associate professor in the department of anesthesiology, program director of the neuroanesthesia fellowship, and co-director of the Brain Injury Translational Research Center. He practices neurocritical care and is interested in multidisciplinary ICU care, pertinent to this month's topic. He serves on SNACC's Board of Directors and the Scientific Affairs Committee.

As always, we encourage all of our readers to tell us what they think by joining us on the [LinkedIn](#) feed the [Twitter](#) feed, or the [Facebook](#) page.

-Adrian Pichurko, MD; Oana Maties, MD and Nina Schloemerkerper, MD

### **Commentary**

### **Anything Your ICU Can Do, Mine Can Do Better**

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This study is a secondary analysis of The American Association for the Surgery of Trauma Multi-Institutional Trials Committee (AAST-MITC) decompressive craniectomy study. Eleven Level 1 trauma centers provided clinical data and head computed tomography (CT) scans of 2951 patients admitted to intensive care units (ICU) with Glasgow Coma Scale score of 13 or less and CT evidence of traumatic brain injury (TBI). Multivariate logistic

regression was performed to measure the association between ICU type and survival and calculate the probability of death for increasing Injury Severity Score (ISS). Multiple injuries patients (ISS > 15) with TBI and isolated TBI patients (other Abbreviated Injury Scale score < 3) were analyzed separately. The authors hypothesized that isolated TBI patients will have lower mortality and morbidity when admitted to a neuro ICU, and multiple-injury patients with TBI derive additional benefit when cared for in a trauma ICU.

For subgroup analysis, patients with multiple injuries (defined as a head injury and Abbreviated Injury Scale (AIS) score  $\geq 3$  in chest, abdomen, pelvis, or long bone) and isolated TBI (defined as head AIS score  $\geq 2$ , all other AIS regions score < 2) patients were identified. The authors' primary outcome was in-hospital mortality. Early deaths occurring in less than 24 hours were excluded. Even though they were limited by the non-random samples (i.e., patients were not randomized for admission to different types of ICUs) and self-defined ICU types (neuro, trauma, med/surg) by the site-investigators for the parent study, the authors were able to show that, among all comers with TBI and increasing ISS score, admission to a specialty ICU was protective as compared to a med/surg ICU. This association was not present when increasing age was used as the covariate, or when assessing isolated TBI only.

That units staffed with providers who have acquired the background to care for certain types of patients might provide better outcomes for those patients seems intuitive. However, due to the inherent limitations of the study design, extrapolating these findings to any specific ICU is difficult. A neuro or med/surg ICU at one institution may have greater expertise in treating multisystem trauma than a similar type of ICU at another institution. Thus, any given unit staffed with the appropriate expertise might well have equally good outcomes to any other unit with similar expertise regardless of the designation (trauma, neuro, etc.). Also, there was no study of intervention for the secondary analysis of the parent study. Protocoling treatments provided for specific patients (isolated TBI vs. multi-system trauma) might improve outcomes across subspecialty unit types. Finally, mortality is not an overly informative outcome. Levels of long-term neurological recovery are required to truly measure differences across interventions, care, etc. when discussing patients with brain injury.