Evaluating Early Appropriate Care Criteria for Acute Axial and Lower Extremity Fractures: A Large Database Propensity-Matched Cohort Analysis

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INTRODUCTION:

Early Appropriate Care (EAC) recommends definitive management of unstable fractures of the axial and femur within 36 hours of injury if the patient has adequate resuscitation defined as a lactate < 4.0 mmol/L, pH > 7.25, or base excess < -5.5 mmol/L. The EAC is a useful tool in risk-stratification to determine the best timing of management, but the current literature on the algorithm is limited by sample size. The purpose of this study was to determine if EAC criteria remain valid in a larger database of patients.

METHODS: TriNetX, a global federated research network, was retrospectively queried to identify adult patients with axial or femur fractures presenting to the emergency department (ED) with hemodynamic instability requiring resuscitation. Polytrauma patients with other significant injuries were excluded. One-to-one propensity score matching for age, sex, race, and comorbidites was conducted to generate two cohorts based on whether they met EAC criteria and underwent surgery within 48 hours of ED admission or greater than 48 hours. RESULTS:

A total of 4,802 patients met criteria for EAC and underwent index procedure within 48 hours, and 1,844 underwent index procedure in >48 hours. After propensity matching, both cohorts consisted of 1,838 patients. Outcomes were analyzed at 30 days, 60 days and 2 years post-op. At 30 days, the patient group who met EAC and underwent surgery within 2 days had significantly reduced risk for sepsis (1.2% vs 2.1%, p = .04), DVT (0.05% vs 0.09%; p< .01, pulmonary embolism (0.03% vs 0.04%, p=0.026) and death (2.9% vs 5.0%, p < .01).

DISCUSSION AND CONCLUSION: Early appropriate care of axial and femoral shaft fractures following adequate resuscitation is associated with lower rates of DVT, PE, sepsis, and death in the immediate postoperative period. This data validates the findings of previous smaller studies with the use of a large national database.