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Comparing the Safety and Efficacy of a Rapid High-Sensitivity Cardiac Troponin I Protocol Between Hospital-Based and Free-Standing Emergency Departments

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Abstract:

Study Objectives: Current high sensitivity cardiac troponin I (hs-cTnI) research has been conducted almost exclusively in hospital-based emergency department (HBED) settings and the translation of these protocols into free-standing emergency departments (FSED) has yet to be explored. This study compared the safety and efficacy of applying a rapid-rule out protocol using hs-cTnI for exclusion of acute myocardial infarction (AMI) in HBEDs and FSEDs.

Methods: This was a secondary analysis of a randomized trial of patients evaluated for possible AMI in 9 emergency departments (ED) from July 2020 through March 2021. The trial arms included a new 0/1-hour rapid protocol using hs-cTnI versus standard care, which used a 0/3-hour protocol without reporting hs-cTnI values below the 99th percentile. The primary outcome was safe ED discharge, defined as discharge with no death or AMI within 30-days. Analysis included a mixed-effect model adjusting for demographic variables.

Results: There was a statistically significant difference in safe discharges from FSEDs when comparing the standard care arm (86.2%) to the rapid rule-out protocol (95.1%). There was a statistically significant reduction in FSED length of stay with application of a rapid rule-out protocol at 3.43 hours vs. 3.97 hours using standard care. The percentage of patients who ruled-out with their initial hs-cTnI (<4 ng/L) at FSEDs (74%) was also significantly larger when compared to HBEDs (54%).

Conclusion: Implementation of a hs-cTnI rapid 0/1-hour protocol to evaluate for AMI in FSEDs is feasible and had greater impact on safe ED discharge and length of stay compared to HBEDs.