Impact of a Full-Scale Mass Casualty Exercise on Emergency Department Operations at a Level One Trauma Center and Academic Referral Hospital

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Introduction: Emergency departments (EDs) must be prepared for sudden surges of critically ill patients. To maintain readiness, United States (U.S.) hospitals conduct full-scale mass casualty (MCI) exercises, though few studies examine their impact on real-time patient care in active EDs. This study addresses this gap by evaluating the operational impacts of a full-scale exercise (FSE) conducted at a major U.S. level one trauma and tertiary referral center.

Methods: A planned exercise occurred on a Wednesday in September between the hours of 8:00 and 11:30 a.m. Data was collected from the electronic medical record on the exercise day and on four preceding and four following Wednesdays across two time periods: Exercise Hours and the Full Clinical Shift. Data collected included the primary outcome of 'ED length of stay (LOS)', and secondary outcomes, including 'Arrival to Destination', 'Arrival to Provider Assigned', and 'Arrival to Disposition Decision', all measured in minutes.

Results: Overall, the study found no evidence that LOS and 'Arrival to Disposition Decision' were impacted by the exercise. 'Arrival to Provider Assigned' times were shorter on the exercise day, and 'Arrival to Destination' was not impacted during Exercise Hours but was impacted during the full Clinical Shift, with shorter times on the exercise day.

Conclusion: This program evaluation demonstrates that MCI drills can be performed in active EDs without affecting clinical operations and, thereby, impact on real patient care. Future studies should expand on this clinical metric evaluation and assess real patient outcomes, return visits, and clinician cognitive load for a more comprehensive evaluation of FSE impacts on EDs.