# TRAUMA RESUSCITATION USING IN SITU SIMULATION TEAM TRAINING (TRUST) STUDY: A NOVEL APPROACH TO SAFETY THREAT IDENTIFICATION AND HIGH-PERFORMANCE TEAM TRAINING

## Reference to abstract or paper:

Protocol published in BMJ Open 2016 Nov 7: Study protocol for framework analysis using video review to identify latent safety threats: trauma resuscitation using in situ simulation team training (TRUST)
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## Description of Innovation:

### Background

Trauma resuscitation requires a multidisciplinary team to perform at a high level within a dynamic, high-stakes environment. The unpredictable nature of trauma care increases the possibility for errors, often from underlying latent safety threats (LSTs). In situ simulation (ISS) is a point-of-care training strategy that occurs within the patient care environment involving the actual healthcare team and provides an innovative approach to quality improvement, LST identification and team training. Using risk-informed ISS, critical events can be recreated providing an opportunity to explore and learn from past challenges that may impact patient safety and system processes.

### Objective

To pilot regular, multidisciplinary unannounced in situ trauma simulations that will aid to:

1. identify latent safety threats
2. understand resuscitation ergonomics
3. evaluate team coordination and performance during high-stakes situations

## Methods

First, we undertook a comprehensive engagement process with all stakeholders involved in trauma care. Simulation cases were derived from a review of adverse events and unexpected deaths. Human factors experts aided with the integration of system- and process-related elements into the case design. We then conducted unannounced ISS sessions that began with a trauma team activation. Scenarios used either a high-fidelity manikin or standardized patient. Semi-structured debriefing facilitated team-based discussion and opportunity for reflective practice with participant-driven LST identification to augment ethnographic observation and process mapping. Using a framework analysis, LSTs were identified and categorized into seven themes that relate to clinical tasks, equipment, team communication, and participant workflow. LSTs were quantified and prioritized using a hazard scoring matrix. Feasibility was measured by impact on ED workflow and interruptions of clinical care.

## Results and Reflections

We recently completed the data collection portion (in situ simulation scenarios) of the study. The study from development to implementation represented a massive undertaking requiring widespread engagement from hospital administration, ground level providers and a large study team. These efforts resulted in the successful implementation of regular, high-quality in situ simulations at a Level 1 trauma centre – at minimum, an effective proof of concept. The existing literature is sparse regarding similar efforts and this is likely, in part, due to the inherent challenges of integrating trauma and in situ simulation:

- Bringing an ad hoc team together for regular training when they spend the rest of their day in other areas of the hospital
- The unpredictability of trauma care, requires that we delay or cancel sessions when a real patient requires care
- The integration of in situ simulation when it is not yet part of the institutional culture, mandates considerable efforts to positively affect change

Employing key change management strategies, outlined by Kotter, was essential for the study's success. This study also allowed us to apply a novel approach to LST identification. Until now, most studies using ISS for LST identification relied on participant feedback +/- video review at the discretion of the researchers. We applied a novel human factors approach (i.e. framework analysis) to perform a deep dive into the potential areas of risk to patients. In addition, we developed a novel tracking tool that can be quickly used to study team workflows, highlight high traffic areas, engage participants and investigate different team behaviors (figure 1). Much of our data analysis was performed by human factors experts (HumanEra) with whom we partnered throughout the study. This unique partnership was a key element leading to the innovations (both framework analysis and tracking tool) developed during the study.

The data from this study has helped inform changes across several domains:

- Modifications to our high-stakes processes (e.g. massive transfusion protocol)
- Ergonomic optimization of existing equipment, workspace and workflows
- Identification of areas for subsequent educational efforts and increased staffing to enhance trauma team performance
- Integration of findings into the design of a new ED space and infrastructure

BOTTOM LINE:

In situ simulation represents a unique and effective training strategy to target both educational and quality improvement efforts, particularly in high-stakes environments. Future studies should investigate the impact of regular ISS on patient oriented outcomes.

## Suggested Reading:

1. Fan M, Petrosoniak A, Pinkney S, Hicks C, White K, Almeida AP, et al. Study protocol for a framework analysis using video review to identify latent safety threats: trauma resuscitation using in situ simulation team training (TRUST). BMJ Open. 2016;6(11):e013683.
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6. Spurr J, Gatward J, Joshi N, Carley SD. Top 10 (+1) tips to get started with in situ simulation in emergency and critical care departments. Emerg Med J. 2016;33(7):514-6.
7. Steinemann S, Berg B, Skinner A, DiTulio A, Anzelon K, Terada K, et al. In situ, multidisciplinary, simulation-based teamwork training improves early trauma care. J Surg Educ. 2011;68(6):472-7.