

In Situ Simulation of Extracorporeal Membrane Oxygenation (ECMO) Cannulation for Identification of Latent Risk Threats in the Emergency Department

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IN SITU SIMULATION OF EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) CANNULATION FOR IDENTIFICATION OF LATENT RISK THREATS IN THE EMERGENCY DEPARTMENT Emily Ferrari MD, Sarah Ringstrom MD, Sydney Hansen MD Department of Emergency Medicine, Hennepin County Medical Center Introduction: Latent risk threats (LRTs) are concealed factors within a system that inadvertently foster errors and increase the likelihood of human mistakes, with the potential to compromise patient safety. In situ simulation (SIM) refers to simulated patient scenarios that occur in the actual workplace, with employees of that workplace as participants. This differs from typical SIM that transpire at a separate center. In situ SIM not only fosters experiential learning but is also an important part of accreditation with The Joint Commission and helps identify LRT within the workplace. With more than 200 ECMO cannulations at HCMC since the induction of the ECMO program, and a large percentage of them occurring in the Emergency Department, it is critical to evaluate and mitigate risk for a procedure with high stakes for both patient and provider. Objectives: Our primary objective was to improve safety in the care of hypothermic cardiac arrest patients by identifying as many LRTs as possible during an in situ SIM of extracorporeal membrane oxygenation (ECMO) in the emergency department (ED) at Hennepin County Medical Center (HCMC). Methods: Simulation center and emergency department educators developed an interactive SIM case centered around a patient suffering from hypothermic cardiac arrest. The in situ SIM occurred in the stabilization room of the ED at HCMC on October 25, 2024. It utilized high-fidelity mannequins, real emergency equipment, real ECMO equipment and simulated medications. Physicians, nurses and health care assistants from both the primary ED team and consulting ECMO specialist teams were involved; all members were unaware that the case was simulated prior to arrival in the ED – save one cannulator. They were instructed to proceed as though it were a real patient. Immediately following the case, simulation educators facilitated a debrief to identify LRTs, which were then stratified into one of three categories (policy issues, equipment issues, or process issues) by an independent reviewer. Results: 20 unique LRTs were identified following debrief and analysis; they are outlined in table one. The most identified category of issues was policy/procedure issues (n=16), followed by process issues (n=3), and a single equipment/environment issue (n=1). The categorized LRTs have been shared with ED leadership and the ECMO specialists for further collaborative improvement. Discussion: Performing this SIM in the ED facilitated the identification of hazards that likely would not have been found with the use of traditional center-based SIM. Process issues including trouble with the intra-hospital paging system would be infeasible to identify in other settings. Recognizing these problems with simulated rather than real patients allows for improvement without negatively affecting patient outcomes. In situ SIM also allowed medical staff, including trainees, to practice with a high acuity, low frequency medical scenario, yielding better individual preparedness for this situation in the future. Post-SIM discussion of the scenario facilitated invaluable problem solving between the involved departments. Expanding the use of in situ SIM

sessions will enable improvement and knowledge among other departments within the hospital which in turn can improve safety for patients.