

Abstracts of Oral Presentations-WADEM Congress on Disaster and Emergency Medicine 2019

SIMULATION

Implementation of Periop Disaster Response Exercise Program at Gold Coast Health

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Introduction: With the move into Gold Coast University Hospital, a new disaster plan was developed in 2017. To assess preparedness for the Commonwealth Games (April 2018), a number of mass casualty exercises were conducted, including a large multi-agency exercise with Queensland Police and Ambulance Services. During this preparation phase, senior clinicians from the perioperative area clarified their sub-plans and developed a novel model of periop response.

Aim: This study assesses this model of response and evaluates it within the context of periop disaster exercises.

Methods: The periop response model evolved through multidisciplinary key stakeholder engagement into a defined model of surgical, anesthetic, and periop nursing responses with dedicated roles and parallel communication streams from ED to OR by the respective specialties. Throughout different disaster exercises, this model of response was tested, refined, and evaluated by formal post-exercise debriefs and group meetings.

Results: Since May 2017, seven different mass casualty exercises with periop response were performed; firstly, a table-top (EmergoTrainSystem) format was used, which revealed communication and logistical deficiencies. After model refinement, further exercises were accomplished, all within the clinical environment, including movements of mock patients from ED to OR. These exercises generated improvements in communication, coordination, and logistics. Every exercise was also used to test more detailed information, communication, and organizational tasks of the various involved craft groups, such as notification, call-in lists, whiteboard structure, transport facilitation, and many more. Overall, our newly developed periop response model proved to be robust and successful, even with rotating personnel through different roles.

Discussion: Apart from the success of the periop response model, other hospital areas (ICU, bed and ward management) became involved. With growing interest and staff turn-over a regular periop disaster response exercise program has now been established. This model of periop response has potential for use in other health systems.

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Preparing for Mass Casualties: Improving Staff Preparedness and Hospital Operations through Multidisciplinary Simulation Training in Disaster Management

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Introduction: World events continue to compel hospitals to have agile and scalable response arrangements for managing natural and instigated disasters. While many hospitals have disaster plans, few exercise these plans or test their staff under realistic scenarios.

Aim: This study explores changes in perceived preparedness of multidisciplinary hospital-wide teams to manage mass casualty incidents.

Methods: Two Emergo Train System (ETS) mass casualty exercises involving 80 and 86 “victims,” respectively, were run at two southeast Queensland hospitals: one large teaching hospital and one smaller regional hospital. Pre- and post-exercise surveys were administered, capturing participants’ confidence, skills, and process knowledge anonymously on 5-point Likert scales. A waiver of ethics review was obtained. Changes in individuals’ pre- and post-scores were analyzed using paired t-tests. Open-ended questions and a “hot debrief” occurring immediately post-exercise allowed for capture of improvement ideas.

Results: Nearly 200 unique healthcare staff (n=193) participated in one exercise. At least one survey was returned by 159 staff (82.4%). Pre- and post- surveys were available for 89 staff; two-thirds (n=59) were nurses or doctors, and 46% overall were emergency department clinicians. Ninety-seven percent reported the exercise was valuable, also recommending additional simulations. Analysis of the 89 matched-pairs showed significant (p<.001) increases in self-confidence, skills, and knowledge (point increases on a five-point Likert scale (95% confidence intervals): 0.8 (0.6-0.9) for confidence and 0.4 (0.2-0.5) for both skills and knowledge. The exercise was critically appraised and a summary of operational learnings

was developed. The most common criticism of ETS was its lack of real patients.

Discussion: Involvement in simulated exercises (e.g. ETS) can increase confidence, knowledge, and skills of staff to manage disasters, with the biggest improvement in confidence. Whilst validating and testing plans, simulations can also uncover opportunities to improve processes and systems.

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The Use of Simulation Games and Tabletop Exercises in Disaster Preparedness Training of Emergency Medicine Residents

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Introduction: Emergency physicians play a frontline role in hospital disaster responses and require appropriate training.

Aim: The aim of the current study was to pilot and compare the effectiveness of two emergency preparedness teaching interventions: the first employing traditional lecture-based instruction (LEC) and the second utilizing interactive simulation/game-based teaching (SIM).

Methods: A two-group randomized pre- and post-test design was implemented into the didactic curriculum of the Emergency Medicine (EM) Residency Training Program at the San Lucas Episcopal Hospital in Ponce, Puerto Rico. Residents (n=23)

completed either a LEC (control) or SIM teaching module (single day, one to two hours) focusing on emergency preparedness concepts, disaster-related clinical decision-making, and physician responsibilities during hospital disaster protocols. Knowledge-based multiple-choice exams and scenario-based competency exams were administered at three different time points: one-week pre-intervention, immediately post-training, and two-weeks post-training. Test scores were compared between groups at each time point using the Mann-Whitney U test.

Results: Following the teaching interventions, no significant differences were found between the LEC group versus the SIM group in knowledge-based exam performance (LEC 81.1%[9.4] vs. SIM 74.9%[12.1]; U=42.50, p=0.15) and scenario-based exam performance (LEC 80.0%[9.7] vs. SIM 80.2%[9.2]; U=62.00, p=0.83), suggesting both teaching methods were similarly effective. Indeed, knowledge-based exam scores improved two-fold and scenario-based exam scores improved by over 50% immediately following training relative to baseline exam scores. Two-weeks post-training, a significant decrease in scenario-based exam performance was found in the LEC group relative to the SIM group (LEC 63.1%[11.6] vs. SIM 75.4%[11.5]; U=91.50, p=0.036), suggesting residents who train with simulations show greater retention of scenario-based concepts compared to those who train with lecture-based training alone.

Discussion: The current study highlights the potential dual value of incorporating simulation training in EM emergency preparedness curriculums in improving both knowledge and concept retention of physician disaster responsibilities.

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