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Simulated Trauma and Resuscitation Team Training course—evolution of a multidisciplinary trauma crisis resource management simulation course

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Abstract

BACKGROUND: We previously reported on a pilot trauma multidisciplinary crisis resource course titled S.T.A.R.T.T. (Simulated Trauma and Resuscitative Team Training). Here, we study the course's evolution.

METHODS: Satisfaction was evaluated by postcourse survey. Trauma teams were evaluated using the Ottawa global rating scale and an Advanced Trauma Life Support primary survey checklist.

RESULTS: Eleven "trauma teams," consisting of physicians, nurses, and respiratory therapists, each completed 4 crisis simulations over 3 courses. Satisfaction remained high among participants with overall mean satisfaction being 4.39 on a 5-point Likert scale. As participants progressed through scenarios, improvements in global rating scale scores were seen between the 1st and 4th (29.8 vs 36.1 of 42, $P = .022$), 2nd and 3rd (28.2 vs 34.6, $P = .017$), and 2nd and 4th (28.2 vs 36.1, $P = .003$) scenarios. There were no differences in Advanced Trauma Life Support checklist with mean scores for each scenario ranging 11.3 to 13.2 of 17.

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CONCLUSIONS: The evolved Simulated Trauma and Resuscitative Team Training curriculum has maintained high participant satisfaction and is associated with improvement in team crisis resource management skills over the duration of the course.

Crisis resource management (CRM) training was 1st popularized and promoted by the aviation industry. These lessons have been adapted to other high-stakes industries as a means of reducing and mitigating human error. In medicine, CRM training programs have been developed in multiple specialties including emergency medicine,[1] critical care,[2] obstetrics and/or gynecology,[3] and anesthesia.[4–6] CRM training curricula often include team members from diverse surgical and medical specialties and allied health care professions. However, many simulations use nonphysician members in an ancillary role as confederates who support physician education. True multidisciplinary training, where all team members are equal participants and equal beneficiaries, is still rare.

We recently published pilot results from a national multidisciplinary trauma CRM course entitled S.T.A.R.T.T. (Simulated Trauma and Resuscitative Team Training).[7] This 1-day training course was designed by a multidisciplinary team. It was delivered to medical doctors (MDs; emergency physicians and surgeons) and 2 non-MD groups (respiratory therapists [RTs] and nurses [RNs]). The intent was to address the individual needs of each discipline and to promote training together as a unified team. This course has now been hosted 3 times at national meetings since the pilot. These meetings include the Canadian Surgery Forum and the national meeting of the Trauma Association of Canada. With each iteration of the course, modifications have been made to the course content, schedule, and scenario design in response to participant and instructor feedback. The goal has been to improve the educational experience for all participants, regardless of specialty or profession. This article summarizes data collected and lessons learned, in hopes that other health care professionals may create and participate in enhanced multidisciplinary learning environments.

Methods

Simulated Trauma and Resuscitative Team Training course development

The development of the initial curriculum has been previously published.[7] At course conclusion, common debriefing sessions were held with all participants and instructors in an attempt to maintain the course's strengths and identify areas for improvement. This was bolstered by written feedback (both narrative and Likert scale) from participants immediately after each course. The course directors and curriculum committee met to review all feedback with the goal of ongoing improvement at the end of each course.

The S.T.A.R.T.T. course[7] remains an 8-hour course introduced by 2 short lectures reviewing basic CRM principles and trauma team roles and responsibilities. Participants are then oriented to the mannequins and equipment. Participants are divided into teams of 4 to 6 attending or resident physicians (MDs), 1 to 3 RNs, and 1 to 2 RTs. Teams then rotate through 4 standardized high-fidelity trauma simulations delivered using a simulation mannequin. Each simulation lasts approximately 15 minutes, immediately followed by a 45 minute debrief. All team members (MDs, RNs, and RTs) are blind to the simulation scenario content, and there are no confederates among the participants.

Course measures

The courses were evaluated in 3 ways. First, as in the previous publication,[7] all participants completed a post-course satisfaction survey with all responses using a 5-point Likert scale (Appendix 1). Second, a single rater assessed the teams' CRM skills as a group during each simulation session using the previously validated Ottawa global rating scale (GRS).[2] The Ottawa GRS uses a 7-point Likert scale to assess performance in 5 categories (leadership skills, problem solving skills, situational awareness skills, resource utilizations skills, and communication skills) and an overall performance score to yield a total maximum score of 42. Third, a separate rater assessed the teams' adherence to standards of care defined by the Advanced Trauma Life Support (ATLS) course using a checklist developed for this study (Appendix 2).

Statistical analysis

Mean scores for each of the responses on the post-course satisfaction survey were compared based on profession (MD, RT, RN) by 1-way analysis of variance (ANOVA). Mean Ottawa GRS scores and ATLS checklist scores were compared for each simulation session using separate ANOVAs. All significant ANOVA differences ($P < .05$) were further analyzed by using post hoc testing with Tukey's HSD (honest significant difference) method to localize the pairwise differences.

Results

Course modifications, based on feedback

In response to feedback, the following major modifications have been made to the course curriculum since the original publication: