

Abstract:

Interprofessional team training in medicine evolved out of crisis resource management principles initially used in the aviation industry to improve teamwork and communication skills. With the 1999 publication of the Institute of Medicine report, *To Err is Human: Building a Safer Health System*, there has been an ever increasing focus on the impact of communication and teamwork on the rate of medical error and quality of patient care. With this in mind, there is a growing acknowledgement of the need for training in these critical skills. Recently, simulation-based team training programs have been developed across a variety of disciplines, including anesthesia, surgery, emergency medicine, and pediatric emergency medicine. As the number and spectrum of these programs has increased, best practices for high-quality training programs have been published, including the following: practice recommendations for curriculum design, scenario design, feedback, and debriefing. Assessment tools have also been developed to evaluate the quality of these teamwork behaviors, as well as the potential impact of these programs. Although the impact of simulation-based interprofessional team training on actual patient care has been investigated in several studies, it is clear that further work is needed to fully evaluate the effect of this training and the best techniques and processes to accomplish the objectives of high-quality health care for all.

Keywords:

interprofessional; teamwork; assessment; in situ; crisis resource management

Simulation-Based Interprofessional Team Training

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It is well known that for teams to function safely and effectively in high-stakes, high-risk settings, it is critical that they use clear communication and demonstrate quality teamwork behaviors. In medicine, this paradigm of crisis resource management (CRM) evolved out of the “Cockpit or Crew Resource Management” from the aviation industry in the 1970s. When it was reported that up to 70% of the airline crashes were likely secondary to human error and failures in communication, increased effort was placed on identifying strategies to decrease error and strengthen teamwork. Important elements of focus for training in CRM include the following: clearly defining roles, consistent and clear communication, team awareness of the environment, even distribution of workload, and a shared mental model by the team.

In 1999, The Institute of Medicine report, *To Err is Human*, reported an increased risk of medical error across the health care system in the United States, with a reported 44 000 to 98 000 people dying of medical errors each year.¹ Many of these errors were felt to be a result of human factors including poor communication, reinforcing the importance of quality teamwork. After the release of this report, it became even more evident that a variety of clinical arenas in medicine, including the pediatric emergency department (ED), share many characteristics with the aviation industry, including the need for time-critical decision making, the reality of high-stakes outcomes, and the requirement for multiple person teams to efficiently and effectively work together. The description of key elements of CRM in health care has been described (Table 1),² providing opportunity for health care team training to improve clinical performance and patient outcomes.

The increasing acknowledgement of the need for improved teamwork within medicine has led health care educators and

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researchers to ask the following question: can a focus on these nontechnical skills, including improved interpersonal communication and teamwork behaviors, be incorporated into medical practice to improve patient care and safety? One of the first attempts to assess and improve CRM skills in health care teams occurred with the MedTeams project. Taking place across 9 academic and community EDs, this prospective study aimed to evaluate the effectiveness of teamwork training, drawn from aviation CRM programs, on ED staff organized into caregiver teams. The interprofessional teams of providers within the experimental group of EDs underwent a teamwork training curriculum developed by an expert panel. This curriculum focused on 5 team dimensions: maintaining team structure and climate, applying problem-solving strategies, communicating with the team, executing plans and managing workload, and improving team skills. The authors found a significant improvement in the quality of teamwork behaviors and a reduction in the rate of observed clinical errors from 30.9% to 4.4% in the experimental group.³ This study opened the door for the use of simulation-based team training in health care, which has since become the part of the fabric of pediatric emergency care at many institutions across the country.

SIMULATION-BASED TEAMWORK TRAINING

A variety of interprofessional teamwork training programs have been studied in an effort to define the most effective means of educating health care providers. Initially, many CRM programs used lecture-based formats and small group discussion with video triggers. The MedTeams project was among the first to use high-fidelity simulations to educate teams on CRM principles.⁴ Medical simulation was initially developed as a method to educate health care practitioners and to allow for the practice of critical resuscitation practices and

TABLE 1. Key elements of CRM.

| | |
|--------------------------------------|--|
| Know the environment | Know the available resources in your area, including personnel and equipment. |
| Anticipate and plan | Prepare to avoid potential pitfalls. |
| Call for help early | Know individual and team limitations and identify when these limits are approaching. |
| Exercise leadership and followership | Clear role assignment is critical. Mutual respect and the ability to question wrong decisions are just as important. |
| Distribute the workload | Minimize each individual's task overload. |
| Mobilize all available resources | When in crisis, use all resources, personnel, etc. |
| Communicate effectively | "Closed loop communication" is clear, direct communication. Confirmation that orders have been received and completed is critical. |
| Use all available information | Consider/seek out all relevant information (history, vital signs, physical examination) available to treat the patient. |
| Prevent and manage fixation errors | Keep an open mind, obtain a second opinion. Rule out the worst-case scenario. |
| Cross (double) check | Correlate information from various sources; double check critical information. |
| Use cognitive aids | "Never feel bad for looking something up." |
| Reevaluate repeatedly | Ongoing reevaluation is important as medicine is dynamic. |
| Use good teamwork | Mutual respect by team members must be present. Clear role assignment and a shared mental model. |
| Allocate attention wisely | Situational awareness allows the team to concentrate on the most important information/tasks. |
| Set priorities dynamically | Reassess the situation and if necessary redefine priorities. The leader should ask for team input. |

Data from Rall et al.².

procedures. It has been found to be uniquely suited to train individuals and teams in the assessment and management of low-frequency/high-acuity events. With the use of high-fidelity simulators, the clinical staff experiences real-time feedback of their decisions and interventions in the form of changes in patient responsiveness, vital signs, prognosis, and outcome. By allowing teams to care for "patients" in simulated high-stakes environments, participants and facilitators can discuss and debrief in a safe setting similar to their own clinical practice. Since these initial studies, simulation has rapidly become a commonly used method to teach and practice CRM skills across a variety of clinical settings from the ED to the intensive care unit, inpatient wards, and the operating room.⁵⁻⁹

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