Multidisciplinary Simulation Centers: Promoting Safe Practice

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Abstract: As the impact of medical mistakes and the significance of patient safety become more evident through the work of national agencies such as the Joint Commission on Accreditation of Healthcare Organizations, the Institute for Healthcare Improvement, and the Agency for Healthcare Research and Quality, health care organizations are searching for innovative techniques to train hospital personnel on providing safe patient care. High-fidelity human patient simulation has gained popularity in the fields of nursing and medical education and for orientation programs that introduce new nurses to critical care. However, creative methods for the application of high-fidelity simulation in the continued professional development and education of experienced nursing personnel, residents, respiratory therapists, pharmacists, and doctors remain limited within the hospital setting. This article highlights the significance of simulation in health care and the impact, for members of the health care delivery team, of simulation-based training on decision making, critical thinking skills, teamwork, effective communication, and patient safety.

Cite this article:

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In 1979 investigators identified nontechnical issues such as communication and human factors as primary contributors to almost 70% of aviation accidents (Leonard, Graham, & Bonacum, 2004). As a result, the aviation industry developed a training program that focused on maximizing teamwork and improving communication. Started by United Airlines in 1981, crew resource management (CRM) training and simulation were used to improve flight operations by teaching team-building exercises, situational awareness, stress management skills, and decision-making strategies in high-stress, high-risk situations (Helmreich, Merritt, & Wilhelm, 1999). Research has shown that CRM’s ability to raise awareness of teamwork and safety in the simulated environment actually improves flight crew performance (Leonard et al., 2004).

At the same time, as aviation struggled to improve safety, patient safety became more of a priority in health care. Innovations in technology and funding for research led investigators to adapt the concepts of aviation to the training of health care personnel in an attempt to improve safety (Cooper & Taqueti, 2004). In conjunction with CRM training, Dr. Dave Gaba and a group of anesthesiologists working at Palo Alto’s Veterans Hospital in the late 1980s designed CASE 1.2, the first manikin capable of physiologic manipulation, to simulate critical events in the operating room (Cooper & Taqueti, 2004). This
medically based team training program used patient simulators and clinical scenarios to help improve technical and interpersonal skills among anesthesia residents during critical events. The patient simulators designed by Gaba and used in conjunction with CRM training have helped pave the way for what we now know as high-fidelity human patient simulators and simulation-based training in health care (Gaba, 2004).

Though successful in anesthesia training at the time, the application of training based on high-fidelity simulation remained stagnant, with little additional work being done in the field, until the 1990s (Cooper & Taqueti, 2004).

In 2000, the Institute of Medicine (IOM) reported preventable adverse events as the leading cause of death among Americans, with between 44,000 and 98,000 Americans dying annually as a result of medical mistakes commonly caused by equipment failure, misdiagnosis, communication breakdown, medication errors, and failure to rescue patients (Kohn, Corrigan, & Donaldson, 2000). As hospitals face increasing patient acuity, limited nursing staff, and decreased lengths of stay, the discovery of unique methods to decrease the risk of error and improve patient safety is often difficult. Methods to improve patient safety are no longer focused solely on improving individual performance but more importantly on system failures and improving team performance within healthcare organizations (Agency for Healthcare Research and Quality, 2006). For this reason, the IOM has suggested the use of simulation as a method to improve the safety culture in health care (Kohn et al., 2000), and the Agency for Healthcare Research and Quality (2006) is investigating the impact of simulation-based training on patient safety. Simulation-based training fits into the IOM’s strategy for improving patient safety by promoting three of its initiatives: promoting a culture of safety, improving teamwork and communication, and enhancing rapid response to crises in the hospital (Kohn et al., 2000). Simulation allows healthcare workers the opportunity to practice effective communication, address team dynamics and identify system failures in a controlled environment where open discussions can occur (Nadzam, 2009). The ultimate goal is that when exposed to similar situations in practice, they have been properly prepared through simulation, decreasing the likelihood that an error might occur. Despite these recommendations, many hospitals have ignored the opportunity to incorporate patient simulation into the training and continued education of hospital personnel.

In recent years, medicine and nursing education, disciplines that previously relied more on low-fidelity simulation to teach psychomotor skills, have incorporated high-fidelity simulation into many curricula (Scalese, Obeso, & Issenberg, 2008; Seropian, Brown, Gavilanes, & Driggers, 2004). Limited availability of patients, clinical sites, and educators, coupled with an increased emphasis on evidence-based practice and patient safety, has pushed nursing programs to find creative methods to educate students (Seropian et al., 2004). Simulation is now being used with much success to effectively develop critical thinking, enhance decision making, support teamwork, practice skills, and build clinical confidence among nursing students (Larew, Lessans, Spunt, Foster, & Covington, 2006). Simulation allows for participative learning, in which students are given the opportunity to practice problem solving, critical thinking, communication, and delegation methods with the opportunity for immediate feedback from instructors (Rauen, 2004). Nursing students who have simulation embedded into their programs report being challenged in their critical-thinking and decision-making skills (Parr & Sweeney, 2006). It seems that the continued use of simulation-based training in the hospital setting would only serve to reinforce those skills acquired in school, and that additional research regarding the efficacy of simulation to further develop communication, delegation, and teamwork among all members of the healthcare team is needed to support its implementation in the hospital setting.

Because of its success in nursing education, simulation is also being incorporated into the repertoire of some nurse educators as an effective training method for orientation in the acute care setting (Ackermann, Kenny, & Walker, 2007). As more graduate nurses with little or no experience, limited orientation, and higher expectations enter the world of critical care, with soaring patient acuity and advanced technology, simulation can be used not only to enhance learning but also to prepare nurses for entry into areas such as cardiac surgery and the intensive care unit (Rauen, 2004 & Ackermann et al., 2007). Nurses in one orientation program supported the use of simulation because of its ability to make codes more realistic, allow participants to see actual responses to interventions, and help incorporate critical thinking into complex case studies (Ackermann et al., 2007). While few nurses have the opportunity to experience and learn from a critical incident during their orientation, even fewer are given the opportunity to train with other members of the healthcare team to prepare for when these incidents do occur. Simulated critical incidents that focus primarily on communication principles, collaboration, and team work during medical crises are used by only a handful of nurse residency programs (Beyea, von Reyn, & Slattery, 2007). Further development of orientation programs that incorporate multidisciplinary simulation training will provide the

Key Points

- Simulation-based training helps raise awareness about patient safety and can assist in decreasing medical errors.
- Organizations like the JCAHO, IHI, and AHRQ now recognize the impact simulation based—training has on patient safety.
- Training a team together prepares personnel for how they will practice when real crises occur.
opportunity to not only practice critical thinking and technical skills, but help new nurses define their role as a member of a team providing care for critically ill patients. Medical schools struggle with similar issues. Decreased lengths of stay, rarity of some diseases, a need for hands-on training with new technology, ability to assess clinical competence without compromising patient safety, and an emphasis on team training all provide rationale and justification for simulation-based training (Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005). The integration of simulation into medical education better prepares students for the realities of practice, a prime reason simulation has gained acceptance as a valuable training tool in the past 10 years (Salas, Wilson, Burke, & Priest, 2005).

However, the use of simulation in medical education remains limited. Some fields of medicine, such as anesthesiology, critical care, and emergency medicine are utilizing high-fidelity mannequins, in conjunction with simulated scenarios, to help teach the skills required to manage critical incidents and provide safe care (Scalese et al., 2008). This method of team training, better known as crisis resource management, is slow to be accepted in other disciplines despite its success (Flanagan, Nestel, & Joseph, 2004). Though deficiencies in crisis management have been identified as a leading source of error in healthcare (McConaughey, 2008), crisis resource management and simulation-based training is yet to be recognized as an important component of medical education (Brindley, Suen, & Drummond, 2007). Although notably effective in nursing and medical education, the impact simulation has on patient safety and its ability to decrease medical errors by improving team function has caught the eye of organizations such as the Joint Commission on Accreditation of Healthcare Organizations, the Institute for Healthcare Improvement, and the Agency for Healthcare Research and Quality (2006). A 2004 review of sentinel events identified communication as the root cause of 70% of all cases (Joint Commission on Accreditation of Healthcare Organizations, 2004), so finding methods to improve communication among health care providers is vital. The IOM recommends that “health care organizations establish interdisciplinary team training programs, such as simulation, that incorporate proven methods of team management” (Kohn et al., 2000, p. 156). In addition, the Agency for Healthcare Research and Quality (2006) recently dedicated $5 million in grants to “assess and evaluate the role that simulation can play to improve the safe delivery of quality health care.” Obviously there is a heightened awareness of simulation’s ability to enhance clinical practice. Because of this, its uses are being recommended more frequently among regulatory and credentialing organizations to improve patient safety efforts throughout health care (Seropian et al., 2004).

Although simulation and CRM focus on improving clinical practice and patient safety by enhancing teamwork strategies, few health care organizations have adopted the concept of training the entire health care team with simulation. Although teams that function well can provide safer, more efficient care (McConaughey, 2008), health care institutions still primarily focus training and education on the acquisition of individual skills and knowledge rather than evaluating team performance (Gaba, 2004). Medical training has historically prepared individuals to care for other individuals, ignoring the importance of safety and teamwork training and rarely introducing students to team concepts (Issenberg et al., 2005). Nurses, doctors, and other members of the health care team infrequently train together, despite having to work alongside each other every day. Simulation offers an opportunity for multidisciplinary collaboration in which all members of the team are encouraged and expected to participate (Nunn, 2004). Doctors and nurses communicate differently, so it is no surprise that most medical errors occur because of poor communication and ineffective teamwork, and inexperience in managing critical events (Brindley, Suen, & Drummond, 2007). Nurses are very detail oriented and descriptive while physicians prefer a summary of events and details related to their patient (Haig, Sutton & Whittington, 2006). There often is no shared model of communication or policy standardizing the transmission of information between nurses and physicians, and differing personal opinions on what is vital information often leads to missed information and sometimes error (Nadzam, 2009). Additionally, a hierarchy exists among doctors, residents, and nurses, and even though a nurse might have a solution to the problem, he or she is sometimes afraid to speak up (Leonard et al., 2004). In a 2005 research study on crucial conversations in healthcare, more than one half of surveyed healthcare workers had witnessed broken rules, mistakes, lack of support, incompetence, poor teamwork, disrespect, and micromanagement, with fewer than one in ten choosing to discuss those concerns with their co-worker (Maxfield, Grenny, McMillan, Patterson, & Switzler, 2005). Though crucial conversations regarding these issues correlate strongly with a reduction in medical errors and improved patient safety, few healthcare workers will address such concerns for fear of retaliation and disruptive behavior including intimidation, verbal outbursts, and condescending attitudes (Nadzam, 2009). Simulated learning experiences break down these barriers to effective communication allowing members to role play, handle difficult co-workers or situations, and ask questions to maximize the work and function of the team. Training nurses, doctors, residents, students, and respiratory therapists together as a team prepares them for how they will practice when real crises occur.

As discussed before, simulation is gaining popularity in medical and nursing schools as an effective educational tool and is being used in more health care institutions to facilitate and supplement orientation programs (Rauen, 2004). Gaba (2004) suggested that while simulation is important during the initial stages of education and orientation, its continued use in training experienced personnel...
provides the opportunity for repeated rehearsal, performance assessment, and clinical improvement. The fact that a nurse or physician has 20 years of experience does not mean that he or she has the skills required to manage and stabilize critically ill patients, or understand how to be an effective member of a team. Providing a controlled, safe environment where experienced personnel have the opportunity to focus on team dynamics and effective communication allows for immediate application into practice (Brindley et al., 2007).

Organizations such as the Federal Aviation Administration have mandated CRM and simulation-based training for flight crews because of their impact on the culture of safety in aviation (Musson & Helmreich, 2004). But healthcare organizations have failed to recognize its impact thus far (Musson & Helmreich, 2004). Utilizing simulation to develop communication, teamwork, and critical thinking skills in addition to fine-tuning the knowledge, and expertise of seasoned staff throughout the health care organization should be part of a standard curriculum for continued professional development. Encouraging, and at times requiring, experienced staff to participate in multidisciplinary simulated learning exercises assures not only clinical competence, but continual reinforcement of the principles of effective teamwork and crisis management, ultimately leading to improved patient safety.

References


