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Using simulation with interprofessional team training to improve RRT/code performance

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ABSTRACT

Early recognition of and response to changes in patients' conditions are a National Patient Safety Goal. Rapid Response Teams (RRTs) are one safety strategy aimed at early recognition of signs and symptoms of clinical deterioration and reduction in rates of cardiopulmonary arrest and death in hospitalized patients. Mock codes and RRTs are another strategy for improving outcomes.The Corporal Michael J. Crescenz VA Medical Center(CMCVAMC) used data from the American Heart Association National Registry of Cardio-Pulmonary Resuscitation to create an interprofessional, collaborative program using simulation. The program included: review of emergency responses and hands-on sessions with crash cart equipment, airway management, and BLS skills, followed by a mock RRT and Code with debriefing. Participants in this quality improvement initiative were nurses, physicians, anesthetists, pharmacists, and respiratory therapists. They evaluated the simulation as a positive learning experience. Staff and patient outcomes were improved after the program. The program engaged staff and promoted interprofessional collaboration that may ultimately improve the quality of patient care.

1. Introduction

Early recognition of and response to a deteriorating patient has been identified as a National Patient Safety Goal.[1] Creation of Rapid Response Teams (RRTs) or Medical Emergency Teams was also an initiative of the Institute for Healthcare Improvement's 5 Million Lives Campaign with the goal of improving the quality of health care. RRTs were developed with the intent that early recognition of signs and symptoms of clinical deterioration can reduce rates of cardiopulmonary arrest and death in hospitalized patients. Ultimately, RRTs improve the quality of care and produce positive patient outcomes.[2]

The Corporal Michael J. Crescenz VA Medical Center (CMC VAMC) uses the American Heart Association (AHA) National Registry of Cardio-Pulmonary Resuscitation (NRCPR) to track compliance with ACLS in the care given to veterans receiving resuscitative measures. In 2011, NRCPR transitioned to the American Heart Association's Get with the Guidelines®.[3] As a standard and source of data, the NRCPR Registry enabled the CMCVAMC to take an in-depth, systematic look at resuscitative practice on an institutional level. The registry serves as an international database of in-hospital cardiopulmonary resuscitation and rapid response (medical team emergency response) events that may be used to identify and monitor key process variables and patient outcomes.[4] The program allows sites to evaluate current practice and identify areas for performance improvement, and provides resources to improve practice and patient outcomes.

The CMC VAMC implemented a Rapid Response Program in 2009. Based upon the NRCPR data supplied during the first year, gaps in the utilization of RRTs were identified. Specifically, RRT calls were underutilized during the night shift, while the number of cardiac arrest calls (Codes) remained high during the night shift. Also, healthcare staff, nurses, nurse managers, and physicians identified shortcomings during emergency response situations. Identified areas of concern included use of effective communication, use of emergency equipment (code cart, defibrillator), and skill competence. As with any skill, the skills of Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) require practice to

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ensure competence. Additionally, cardiopulmonary emergencies are high-risk, low-incidence events, with little opportunity to practice these skills and no room for error.

Although nurses and physicians work side by side as members of a healthcare team, with the same goal of effecting positive patient outcomes, interprofessional communication remains an important cause of errors.[5] This led to the development of an interprofessional, collaborative, quality improvement (QI) program using simulation that addressed healthcare members' roles and responsibilities in Code and RRT situations. The aims of the program were multifaceted: improve patient outcomes; increase healthcare team members' knowledge, competence, and confidence in emergency situations; facilitate intraprofessional communication and teamwork; and utilize simulation as a reality context for practice.

The purpose of this paper is to describe an interprofessional program that used simulation to improve RRT/Code performance. The details of the program and outcomes are discussed along with program limitations and future directions.

2. Review of literature

An interprofessional approach employing simulation offered great potential to meet the program goals. Review of the literature supported the potential benefits of an interprofessional QI program and the use of simulation to reinforce healthcare members' roles and responsibilities in Code and RRT situations. Literature relevant to the project included several interrelated areas: RRTs, use of simulation to improve skill and competence, and communication and teamwork.

2.1. Rapid Response Teams (RRTs)

Early recognition of and response to changes in patients' conditions have been identified as a National Patient Safety Goal.[1] RRTs were developed with the intent that early recognition of signs and symptoms of clinical deterioration can reduce rates of cardiopulmonary arrest and death in hospitalized patients. Creation of RRTs was an initiative of the 5 Million Lives Campaign, which aimed to improve the quality of health care.[2] In a 5-year study comparing clinical outcomes pre-RRT/post-RRT implementation, significantly higher discharge rates and lower mortality rates were found post-RRT implementation.[6] Jung et al.[7] also reported improved patient outcomes with a significant decrease ($p = .002$) in mortality rates following institution of RRTs with simulated training. Additionally, barriers to the use of RRT calls have been identified that may result in underuse of activating RRTs. In a qualitative study that examined nurses' perceptions to activating RRTs, Astroth, et al.[8] identified communication with RRT members and need to notify a physician prior to RRT call as potential barriers to activating RRTs. Roberts et al.[9] conducted a qualitative study at a large pediatric hospital and identified barriers to calling RRTs. These included low staff self-efficacy around RRT performance, intraprofessional and interprofessional hierarchies, and fear of negative repercussions from other healthcare professionals.

2.2. Use of simulation to improve skill and competence

Cardiac arrests are high risk/low incidence events on medical-surgical units. Often nurses perceive cardiac arrests as stressful experiences that evoke insecure and fearful feelings. If not used or practiced routinely, BCLS skills deteriorate [10].

A longitudinal pre-test/post-test study evaluated the efficacy of systems-based interprofessional simulated based training for RRTs and Codes (cardiopulmonary) events.[11] After the simulation training, unit nurses displayed significant increases in their self-confidence around rapid response and cardiac arrest situations, and significant decreases in their self-perceived anxiety around knowledge of emergency medications, around knowledge of contents of the crash cart, and around their roles and responsibilities prior to arrival of the RRT/Code teams. The rate of RRT use in the hospital also increased over time, leading the authors to conclude that nurses' decreased anxiety and increased confidence contributed to increased implementation of RRTs. Kegler, Brandy, and McCarthy[12] reported similar findings of improved staff knowledge and comfort levels after simulation-based RRT training.

Ruesseler et al.[13] incorporated simulated-based training with theory when teaching emergency management to medical students in a new curriculum. Students performed significantly better in the checklist rating of emergency skills than those in the former curriculum. The findings suggested that simulation was effective in enhancing students' emergency skills. Similar findings were reported by Husseman[10] who implemented code drills with nursing staff and noted a significant initial positive effect on code performance; however, this effect was not sustained over time.

Emergency lifesaving skills require regular practice to ensure competent, efficient responses in emergency situations. Simulation provides the practice needed with high-risk, low-incidence emergency situations. Fisher and King[14] reviewed 18 studies between 2004 and 2012 on use of simulation to prepare nursing students to recognize and respond to deteriorating patients. This integrative review concluded that simulation enhanced students' confidence, clinical judgment, knowledge, and competence—all essential characteristics in recognizing and responding to deteriorating patients.

Andreatta, Saxton, Thompson, and Annich[15] conducted a longitudinal, mixed methods study evaluating the effectiveness of simulated pediatric mock codes on patient outcomes. Survival rates in this study were significantly above the average national pediatric survival rates after the initiation of the mock codes. Hill, Dickter, and Van Daalen[16] implemented a mock code program in an acute care setting. Although no significant improvement in patient survival rates was seen, staff acknowledged the value and support of the program and increased confidence in responding to emergency situations.

2.3. Communication and teamwork

Models to enhance interprofessional collaboration in clinical practice and education have emerged. For example, the Interprofessional Education Collaborative[17] developed core competencies for interprofessional practice that can be incorporated in curricula. Interprofessional education is now an accreditation standard for many health profession curricula.

Communication problems among healthcare providers have long been implicated as a major cause of patient error. The Joint Commission identified communication error as one of the top leading causes of sentinel events between 2013 and 2015.[5] An interprofessional collaborative approach improves effective caregiver communication and fosters teamwork. Such an approach involves different disciplines contributing to patient care for a common goal. Collaboration not only entails understanding roles, skills, and expectations, but also appreciating the value that each member contributes to achieve that common goal. To ensure patient safety, effective communication between healthcare team members is critical. Recognizing the importance of effective communication and team work, the American Heart Association (AHA) incorporated communication and team work concepts into their 2015 Basic