The Implementation of Mock Code Simulations Guided by TeamSTEPPS® 2.0 Curriculum to Improve Nurses’ Attitudes Towards Teamwork and Team Performance During Cardiac Arrest: Literature Review

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The Implementation of Mock Code Simulations Guided by TeamSTEPPS® 2.0 Curriculum to Improve Nurses’ Attitudes Towards Teamwork and Team Performance During Cardiac Arrest: Literature Review

BY

Janelle Kriz

A paper submitted in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

South Dakota State University

2020
The Implementation of Mock Code Simulations Guided by TeamSTEPPS® 2.0
Curriculum to Improve Nurses’ Attitudes Towards Teamwork and Team Performance
During Cardiac Arrest

This Doctor of Nursing Practice (DNP) Project is approved as a credible and independent investigation by a candidate for the DNP degree and is acceptable for meeting the project requirements for this degree. Acceptance of this DNP Project does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Brandi Pravecek, DNP, RN, FNP-C
DNP Project Advisor

Melinda Tinkle, PhD, RN, WHNP-BC, FAAN
Associate Dean for Academic Affairs
Acknowledgements

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Abstract

Introduction: In order to provide competent care to patients in cardiac arrest, it is essential the team of health care professionals delivering care is highly proficient. Effective communication and interdisciplinary teamwork are also critical aspects of delivering care to patients in cardiac arrest.

Methods: A T-TAQ questionnaire was completed by willing nurses prior to the intervention. Pre-simulation education guided by TeamSTEPPS® 2.0 Curriculum was given to nurses prior to the first simulation. Nurses participated in two simulations held six weeks apart. Nurses completed the same T-TAQ questionnaire following the second simulation. The questionnaire results were then compared using the Wilcoxon signed-rank nonparametric test.

Gaps: A lack of published literature focusing on rural health care facilities, especially medical or surgical units, was available. Limited evidence which focused on teamwork as the primary outcome of mock code simulations was available. A lack of clear evidence on the optimal frequency of high-fidelity simulations was noted.

Recommendations for Practice: Simulations allow nurses to practice technical skills necessary for caring for patients in cardiac arrest. Simulations can be utilized to improve attitudes towards teamwork and improve communication among participants.

Keywords: cardiac arrest, mock code simulation, debriefing, TeamSTEPPS
The Implementation of Mock Code Simulations Guided by TeamSTEPPS® 2.0 Curriculum to Improve Nurses’ Attitudes Towards Teamwork and Team Performance During Cardiac Arrest

Introduction

According to the Centers for Disease Control and Prevention (CDC) (2017), heart disease is the leading cause of death in the United States (US). In 2016, there were 209,000 in-hospital cardiac arrests in the US with an adult survival rate of 24.8% (American Heart Association [AHA], 2019). The unpredictable and sporadic nature of in-hospital cardiac arrests leads to high levels of stress and anxiety in healthcare professionals caring for these patients, which can negatively impact patient care. Individuals have the highest survival rates when chest compressions and defibrillation are delivered in a timely manner (Herbers & Heaser, 2016; Reece, Cooke, Polivka, & Clark, 2016). Optimal outcomes for patients in cardiac arrest are dependent on a team of well-trained and highly efficient participants. Critical components of delivering high-quality care to patients in cardiac arrest include effective interdisciplinary communication and teamwork (Karnish, Shustack, Brogan, Capitano, & Cunfer, 2019; O’Donoghue et al., 2015).

According to the Agency for Healthcare Research and Quality (AHRQ), Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS®) is a system that can be utilized by health care facilities to improve communication and teamwork among employees. TeamSTEPPS allows facilities to improve their patient care by improving teamwork and communication which are necessary components of high-quality patient care (AHRQ, 2019; Karnish et al., 2019).
Clinical Question

The PICOT question that guided this quality improvement project (QIP) is as follows: In RNs on a 31-bed combined medical/surgical inpatient unit (P) does the implementation of two mandatory mock code simulations guided by TeamSTEPPS 2.0 curriculum (I) compared to current practice with no TeamSTEPPS 2.0 curriculum education or use of mock code simulations (C) improve nurses’ attitudes towards teamwork and team performance when caring for patients in cardiac arrest (O) over a 6-week period (T)?

Methods

A literature review was completed in CINAHL, Cochrane, Google Scholar, Science Direct, and EBSCO databases using the following keywords: high-fidelity simulation, mock code, code simulation, cardiac arrest, TeamSTEPPS, nurse confidence, teamwork, communication, and advanced cardiovascular life support. Inclusion criteria included peer-reviewed articles published between 2015 to 2019 and written in the English language. Articles that were written before 2015 and not written in English were excluded. Forty-six articles were retrieved. Articles were further narrowed down by their applicability to this project, with 18 articles utilized for the literature review and compiled into an evidence table (see Appendix A). The Johns Hopkins Nursing Evidence-Based (JHNEBP) model (see Appendix B) was used to evaluate and grade the following: three level II articles, fourteen level III articles, and one level V article with eleven being grade A articles, six grade B articles, and one grade C article (see Appendix C). See Appendix D for permission for use of the JHNEBP model (Dang & Dearholt, 2017). A search for clinical practice guidelines in simulations revealed only national
simulation guidelines for prelicensure nursing programs and no clinical practice
guidelines were found for those professionals already in practice.

**Evidence Findings**

Teamwork and adequate communication are vital aspects of delivering optimal
care to patients in cardiac arrest. Inadequate communication can lead to ineffective
teamwork, ultimately leading to suboptimal patient outcomes (Lau, Guang Hui Chee, Bin
Ab Hamid, Sieu-Hon Leong, & Tiang Lau, 2019; O’Donoghue et al., 2015).

Interprofessional based simulation training can be utilized to improve teamwork and
communication (Lau et al., 2019). While no clinical practice guidelines for simulations
on medical-surgical units for professionals already in practice were found, the
International Association for Clinical Simulation and Learning (INACSL) Standards of
Best Practice: Simulation™ helps guide simulation design and the implementation of
simulation experiences (INACSL, 2016b).

**Cardiopulmonary resuscitation (CPR).** A quantitative, quasi-experimental
study conducted in Botswana found knowledge retention of CPR decreases after six
months’ time, thus supporting the importance of regular simulation training occurring
every three months. Limitations of this study included limited generalizability along with
a high dropout rate of participants (Rajeswaran, Cox, Moeng, & Tsima, 2018).

Certification alone does not maintain CPR skills or competence, and additional training is
necessary to optimize patient care (Brewster et al., 2017). Although the AHA does not
have a specific time recommendation from the initiation of chest compression to
defibrillation to improve survival, they do recommend early defibrillation for shockable
rhythms (Herbers & Heaser, 2016).
**Simulations.** Josey et al. (2018) found hospitals with more active in-situ mock code simulations have a higher in-hospital cardiac arrest survival rate when compared to hospitals with less active in-situ mock code simulations. A QIP performed on four medical-surgical units at a large suburban hospital found that 41% of participants reported increased self-confidence after the implementation of mock code simulations. Nursing implications discussed in this article included the benefit of performing mock code simulations at regular three-month intervals as well as including debriefing sessions following mock code simulations. The study did have the limitation of a small sample size and did not include respiratory therapists, pharmacists, and patient care assistants, all of whom would normally respond to codes at this facility, thus reducing usual resources that are available (Reece et al., 2016).

A mixed-methods study which focused on the use of a single simulation experience based on interprofessional collaboration among healthcare professional students suggested that effective communication among interdisciplinary healthcare professionals was improved through simulation. A limitation of this study was the use of live standardized patients who had limited training in performing their roles. The study also consisted of a convenience sample from only one university, thus potentially affecting their baseline comfort and communication with each other. A power analysis was not discussed in this study (Karnish et al., 2019). Simulations can be utilized to improve patient care by improving communication among participants (Josey et al., 2019; Karnish et al., 2019; Reece et al., 2016).

The INACSL (2016b) suggests there are standards of best practice when designing simulations, and include the following: constructing measurable objectives,
developing objectives to guide the simulation, and following simulation with debriefing sessions to name a few. Objectives that provide context for participants should be disclosed. However, outcomes measuring performance or critical actions should not be disclosed to participants. Scenarios should include a backstory, a realistic starting point, clinical progression and cues, a scripted scenario, and identification of critical performance measures of participants.

*Attitudes towards teamwork and communication.* Attitudes toward teamwork can directly affect team performance when caring for patients in cardiac arrest. Poor communication among healthcare professionals when caring for patients in cardiac arrest can negatively impact patient outcomes, specifically patient survival. When team members have positive attitudes toward teamwork and communication, team performance is often improved. Improved team performance includes clear delegation of tasks and understanding of duties by those participating in the care of critically ill patients. In order to enhance survival rates and improve patient safety, it is essential to have team members who view teamwork and communication with positive behavior (O’Donoghue et al., 2015).

*Confidence.* The use of simulation experiences allows nurses to gain confidence through practicing the skills necessary to care for patients in cardiac arrest. Cardiac arrests are unpredictable and nurses who have limited experience caring for patients in cardiac arrest typically have less confidence when caring for these patients (Crowe, Ewart, & Derman, 2018; Herbers & Heaser, 2016; Judd, Currie, Dodds, Fethney, & Gordon, 2019; Reece et al., 2016).
A quasi-experimental pilot study by Morton, Powers, Jordan, and Hatley (2019) evaluated the effect of high-fidelity simulation training on mock code performance and self-confidence in nurses on a medical-surgical unit. The study, which included 37 medical-surgical nurses, found a clinically significant decrease in the mean time to defibrillation; improved self-confidence of participants was also noted. This study had utilized a sample size calculation including medium effect size of 0.50, alpha of 0.05, and power of 0.80, revealing at least 34 participants were needed for adequate sample size. Although this number was met within this study, the sample lacked diversity and the study was conducted at only one hospital setting over only a one-day period, limiting generalizability.

In the study by Reece et al. (2016), 41% (n=24) of participants reported an increase in confidence when responding to a code situation while 54% (n=32) reported no change in confidence. There were also 5.1% (n=2) of participants that reported a decrease in confidence following the mock code simulation. The study suggested nurses who have been exposed to mock code simulations gain more confidence than those who do not participate in mock code simulations.

TeamSTEPPS. TeamSTEPPS was developed by the AHRQ and the Department of Defense (DoD) as a tool to improve quality and safety by allowing interprofessional medical teams to optimize information and resources to achieve the best outcomes possible for the patients they are caring for. Patient care can be improved by increasing the awareness and clarity among the interprofessional team regarding their own roles and responsibilities while performing as an effective team member. TeamSTEPPS is an evidence-based method that can be utilized to enhance communication, and thus improve
patient outcomes, such as survival rates following in-hospital cardiac arrest.

TeamSTEPPS is comprised of four core skills including leadership, situation monitoring, mutual supports, and communication. The approach consists of three phases, including a site assessment to determine teamwork-related needs, implementation, and sustaining the TeamSTEPPS intervention. A crucial aspect of this approach is the measurement of outcomes, which can be done utilizing the TeamSTEPPS teamwork attitudes questionnaire (T-TAQ) (see Appendix E). The questionnaire measures individuals’ attitudes towards teamwork, including team structure, leadership, mutual support, situation monitoring, and communication (Baker, Krokos, & Amodeo, 2008). There are limited tools that directly measure attitudes towards teamwork. The T-TAQ questionnaire was selected for this project because it is a previously validated tool that was developed to directly measure the effectiveness of TeamSTEPPS training.

**Debriefing.** Debriefing sessions immediately following the simulation allow participants to reflect on their experiences and enhance learning by promoting self-awareness and self-efficacy. The feedback that is provided to participants through debriefing has been identified as one of the most critical aspects of simulation experiences. The debriefing process has also been found to support the transfer of skills, knowledge, and attitudes to improve the quality of patient care while promoting patient safety and professional role development. Debriefing following a simulation experience should be conducted in a supportive environment in a room separate from where the simulation experience was held and led by an individual who is competent in the debriefing process. Competence can be achieved through a formal course, continuing education opportunities, or working with an experienced mentor. Debriefing should be
based on a framework that allows for reflection of whether the objectives and expected outcomes were met (INACSL Standards Committee, 2016a; Sawyer, Eppich, Brett-Fleegler, Grant, & Cheng, 2016).

There are many debriefing frameworks available. Examples include the Gather, Analyze, Summarize (GAS) method, Debriefing with Good Judgement, Promoting Excellence and Reflective Learning in Simulation (PEARLS), and Plus-Delta (INACSL Standards Committee, 2016a). The best framework for this project was determined to be the GAS debriefing method. This method was chosen because it can be utilized by both novice and experienced debriefing leaders. The use of this tool promotes self-reflection to enhance the learning of participants (Phrampus & O’Donnell, 2013). Debriefing with Good Judgement is composed of three phases including the reaction, analysis, and summary (RAS) has a similar approach to the GAS method however focuses more on the debriefing leader and participants to assess gaps within the scenario as well as how to close those gaps. The PEARLS method adds to the previously mentioned RAS, but also includes an additional phase where key events of the experience are summarized to allow the facilitator and learner to view common themes. The Plus-Delta method utilizes two columns where the plus column identifies positive actions and the delta column refers to those actions that require improvement. While this method is also straightforward and easily utilized by novice debriefing leaders, it does not promote self-reflection to enhance learning within participants which the GAS method involves (Abulebda, Auerbach, & Limaiem, 2019).

The best practice standard is to have a different individual lead the simulation and the debriefing so the leader of the debriefing session can devote enough time during the
simulation to observe participants. Open-ended questions are encouraged to facilitate responses of participants; the use of close-ended questions should be avoided (INACSL Standards Committee, 2016a; Sawyer et al., 2016).

Gaps in the Literature

There is a lack of published literature focusing on rural health care facilities, specifically medical or surgical units in rural facilities. Limited evidence is also available regarding teamwork as the primary outcome of simulations, particularly mock code simulations. A lack of clear evidence on the optimal frequency of high-fidelity simulations was noted during the literature review. A recommended time from the initiation of chest compression to defibrillation was not present within the literature.

Recommendations for Practice

Simulation-based training can improve technical skills and communication among participants when caring for patients in cardiac arrest (Crowe, Ewart, & Derman, 2018; Herbers & Heaser, 2016; Reece et al., 2016). The TeamSTEPPS 2.0 approach may be utilized in health care facilities to improve attitudes towards teamwork and improve team skills (Baker et al., 2008; Luger & Ford, 2019).

Conducting debriefing sessions in a room separate from the location of the simulation is considered best practice and should occur immediately following a simulation experience. Participants should be oriented to the debriefing process as well as the expectation to maintain the confidentiality of fellow participants’ performance. The participants’ emotional reactions should be validated and addressed before providing feedback and allowing for reflection. Individuals leading the debriefing session should be competent in the debriefing process (Sawyer et al., 2016).
Conclusion

The unpredictable, sporadic nature of in-hospital cardiac arrests often leads to stress and anxiety for health care professionals caring for these patients. Survival rates are directly related to the timely delivery of chest compressions and defibrillation (Herbers & Heaser, 2016; Reece et al., 2016). Effective interdisciplinary teamwork and communication among health care providers caring for patients in cardiac arrest can greatly affect the quality of care that is delivered to patients (Karnish et al., 2019; O’Donoghue et al., 2015). Simulation training is a modality to allow nurses to gain confidence by practicing hands-on skills to better care for these patients and improve patient outcomes and survival rates of in-hospital cardiac arrests (Crowe, Ewart, & Derman, 2018; Herbers & Heaser, 2016; Judd et al., 2019; Reece et al., 2016).
References


Rajeswaran, L., Cox, M., Moeng, S., & Tsimas, B. M. (2018). Assessment of nurses’ cardiopulmonary resuscitation knowledge and skills within three district hospitals


### Evidence Table

<table>
<thead>
<tr>
<th>Authors &amp; Date</th>
<th>Study Design/Met hod</th>
<th>Participants, Sample, Setting</th>
<th>Intervention /Variables Studied</th>
<th>Measureme nt</th>
<th>Data Analysis</th>
<th>Findings/Re commendations for Practice</th>
<th>Strengths/Weaknesses</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abulebda, K., Auerbach, M., &amp; Limaiem, F. (2019). In StatPearls [Internet]. Treasure Island, FL: StatPearls Publishing.</td>
<td>Non-experiment al</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>There are many different simulation debriefing designs available for facilitators to choose from based on the situation, setting, and participants. Common debriefing techniques include</td>
<td>Non-experiment al</td>
<td>Level III; Quality Grade A</td>
</tr>
<tr>
<td>Baker, D. P., Krokos, K. J., Amodeo, A. M. (2008). <em>British Medical Journal</em></td>
<td>Pilot Study</td>
<td>N=449</td>
<td>Development of the TeamSTEP PS Teamwork and Attitudes</td>
<td>Reliability and Validity of T-TAQ</td>
<td>Means, item-total correlations, standard deviations, Pearson correlation coefficients</td>
<td>Can be administere d as stand-alone to measure attitudes or as part of a site’s</td>
<td>Can be used alone or in conjunction with site assessments; tool was tested for</td>
<td>Level III; Evidence Grade A</td>
</tr>
<tr>
<td><strong>Quality and Safety, 19(6).</strong></td>
<td><strong>Questionnaire (T-TAQ)</strong></td>
<td><strong>assessment to determine need</strong></td>
<td><strong>reliability and validity</strong></td>
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<td>Brewster, D. J., Barrett, J. A., Gherardin, E., O’Neill, J. A., Sage, D., &amp; Hanlon, G. (2017). <em>Anaesthesia Intensive Care, 45</em>(1), 79-87</td>
<td>Prospective observational study</td>
<td>Evaluated ALS training program that was introduced to ICU and medical staff based on Australian Resuscitation Council Guidelines; attendance of ICU nursing at training sessions, impact of team-based learning, perceptions of team performance</td>
<td>Pre-course learning, simulation, post-course learning; confidence, attendance; satisfaction</td>
<td>Paired t-tests, reported as mean differences with 95% confidence interval; differences in proportions were analyzed using Fischer’s exact test</td>
<td>Improvemenet in attendance, satisfaction and confidence with ALS provisions</td>
<td>Did not look at any clinical outcomes; one facility</td>
<td>Level III; Evidence Grade B</td>
<td></td>
</tr>
<tr>
<td>Crowe, S., Ewart, L., &amp; Derman, S. (2018). <em>Nurse Education in Practice, 29</em>, 70-75</td>
<td>Pre and post analytic design</td>
<td>Convenienced sample in a 650 inpatient hospital, RNs and LPNs, 161 nurses participated in the research study</td>
<td>Simulation intervention, self-confidence of nurses</td>
<td>Pre and post intervention survey</td>
<td>Paired t-tests</td>
<td>Improved confidence in nurses caring for deteriorating patients</td>
<td>Small study with medical nurses from only one hospital, questionnaire was developed for this study alone and has not been tested in other research settings</td>
<td>Level II; Grade A</td>
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<tr>
<td>Herbers, M. D. &amp; Heaser, J. A. (2016). <em>American Journal of Critical Care, 25</em>(5), 393-399</td>
<td>Observational</td>
<td>36-bed medical and vascular surgical progressive care unit with employed 64</td>
<td>Nurse confidence and time from calling the code to initiation of chest compression and first</td>
<td>Pre and post intervention survey for nurse confidence. Observational evaluation tool for</td>
<td>Pre and posttest surveys were analyzed using $x^2$ test, Fisher exact test tested</td>
<td>Improved response times, improved time to defibrillation, increased confidence to initiate</td>
<td>Participants’ survey results were not matched which made it possible for staff to submit more than one</td>
<td>Level III; Quality Grade A</td>
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</tbody>
</table>
registered nurses and 19 nursing assistants; 33-bed thoracic surgical progressive care unit which employed 60 registered nurses and 9 nursing assistants; delivered shock; response times, proper CPR technique and the ability to use emergency equipment; chest compression, overall confidence, and performing as team leader.

survey if they participated more than one mock code, different scenarios were used for each mock and different equipment was available possibly influencing results.

International Association for Clinical Simulation and Learning [INACSL] Standards Committee. (2016a). *Clinical* Non-experiment; standards of best practice n/a n/a n/a Debriefing should be held in a separate room from where the simulation was held; those leading the Non-experimental Level III; Quality Grade A
<table>
<thead>
<tr>
<th>Source</th>
<th>Experimentation Status</th>
<th>Standards of Best Practice</th>
<th>Simulation Design</th>
<th>Debriefing Session</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Association for Clinical Simulation and Learning [INACSL] Standards Committee. (2016b). INACSL standards of best practice:</strong> Simulation design. <em>Clinical Simulation in Nursing, 12</em>, S5-S12</td>
<td>Non-experimental; standards of best practice</td>
<td>n/a</td>
<td>n/a</td>
<td>Construct measurable objectives, design simulation scenario to provide context for simulation experience, follow simulation with a debriefing session;</td>
</tr>
<tr>
<td><strong>Josey, K., Smith, M. L., Kayani, A. S., Young, G., Kasperski,</strong> Ecological Study</td>
<td>28 acute care hospitals in six Midwestern states; 572</td>
<td>In-situ mock code simulations; survival rate of in-hospital</td>
<td>Hospital survival rate to discharge for patients experiencing in-hospital</td>
<td>Univariate statistical analysis; Chi-squared tests with continuity</td>
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</table>

**Increased survival rate associated with more in-situ mock**
<table>
<thead>
<tr>
<th>Authors</th>
<th>Design</th>
<th>Methodology</th>
<th>Analysis</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. D., Farrer, P., … Raschke, R. A. (2018). Resuscitation, 133, 47-52</td>
<td>Quantitative prospective cohort study with single pre-test/post-test design</td>
<td>Comparison of 26 acute care hospitals in six states with a wide range of size from an 18-bed rural critical access hospital to an inner-city 708 bed teaching hospital</td>
<td>In situ mock code (ISM) including standardized code scenarios, internally-developed electronic documents, and an ISM debriefing form to look at the association between ISMC and hospital survival after in</td>
<td>Beneficial association between increased ISMC and patient survival after an in hospital cardiac arrest, CPR performance without subsequent reinforcement can lead to a loss of skill</td>
</tr>
<tr>
<td>Judd, B. K., Currie, J., Dodds, K. L., Fethney, J., &amp; Gordon, C. J. (2019). Nurse Education Today, 78, 44-49</td>
<td>Quantitative prospective cohort study with single pre-test/post-test design</td>
<td>Comparison of 26 acute care hospitals in six states with a wide range of size from an 18-bed rural critical access hospital to an inner-city 708 bed teaching hospital</td>
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<td>Beneficial association between increased ISMC and patient survival after an in hospital cardiac arrest, CPR performance without subsequent reinforcement can lead to a loss of skill</td>
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</table>

Level III; Quality Grade B
<p>| Karnish, K., Shustack, L., Brogan, L., Capitano, G., &amp; Cunfer, A. (2019). <em>Radiologic Technology</em>, 90(6), 552-562 | Mixed-methods design | 26 registered nurses completed 3 simulations conducted with registered nurses undertaking post-graduate studies at a large Australian metropolitan university | Lectures and workshops on assessment and management of common clinical emergencies using ALS theory; 3 hour practice session of airway and cardiac resuscitation to increase technical skills; simulations of 5-6 | Validated trait anxiety questionnaire, self-assessment of ability to respond to emergencies; Descriptive statistics; heart rate, stress, anxiety and confidence scales | Self-reported clinical performance analyzed using paired t-test; linear mixed models to analyze mean difference in heart rate and visual analogue scale | Stress and anxiety significantly decreased with successive simulations | Did not consider what role each student performed during simulation scenarios; needs to be repeated in different settings; logistical constraints; small sample size, no power analysis was undertaken to detect specific effect sizes | Level III; Evidence Grade B |</p>
<table>
<thead>
<tr>
<th>Lau, Y., Guang Hui Chee, D., Bin Ab Hamid, Z., Sieu-Hon Leong, B., Tiang Lau, S. (2019). <em>Clinical Simulation in Nursing, 30</em>(C), 16-24</th>
<th>Observational quantitative design</th>
<th>109 students; 42 nursing students, 47 physical therapy, 20 radiology students</th>
<th>Interprofessional socialization through acute-care simulation; standardized patient simulation</th>
<th>Attitudes related to socialization and interprofessional collaborativ e practice; ISVS-21 survey</th>
<th>Descriptive and exploratory statistics, phenomenological inquiry; two-tailed, paired sample t tests; statistically significant findings</th>
<th>Effective interdisciplinary communication is key in delivering high quality care; Interprofessional simulation to increase communication and teamwork</th>
<th>Convenienc e sample of students from only one university; did not collect cultural demographi c data; limited training for standardized patients</th>
<th>Level III; Evidence Grade B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luger, S. J. &amp; Ford, D. J. (2019). <em>Online Journal of Rural Nursing &amp; Health Care, 19</em>(1), 136-158</td>
<td>Quality Improvement Pilot Study</td>
<td>Critical access hospital with 25 beds, nurses with less than 12 months experience;</td>
<td>Leadership, self-evaluation, communication, conflict managemen t, teamwork, managemen t of patient delivery,</td>
<td>The Leadership Characterist ics and Skills Assessment and TeamSTEP PS Teamwork</td>
<td>Descriptive data due to small sample size</td>
<td>Three of the five participants had increased ability to lead, while one participants ability did</td>
<td>Small sample size; unable to generalize results, rapid presentation of leadership curriculum,</td>
<td>Level III; Quality Grade C</td>
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<tr>
<td>Study Details</td>
<td>Participants</td>
<td>Methodology</td>
<td>Outcomes</td>
<td>Study Outcomes</td>
<td>Weakness</td>
<td>Level</td>
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<tr>
<td>Morton, Powers, Jordan, and Hatley (2019). <em>MedSurg Nursing</em>, 28(3), 177-182</td>
<td>5 participants</td>
<td>Video observation for team performance assessment through simulated resuscitation scenarios</td>
<td>Attitudes Questionnaire</td>
<td>not change, and one decreased</td>
<td>study did not factor in academic nursing preparation</td>
<td>Level III; Evidence Grade A</td>
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**Objective**

- Assessment through video-recording which accurately records scenarios and allows raters to verify their observations and can capture all interactions;
- Weakness of study is recruited on voluntary basis which may

**Methods**

- Quasi-experimental pilot study
- Video observation for team performance assessment through simulated resuscitation scenarios
- Communication and teamwork skills among nursing students and medical students
- Wilcoxon signed-rank; IBM SPSS statistics 25.0; descriptive statistics; Gwet’s agreement coefficient; observational
- Improved CTS and CATS scores indicating increased teamwork and communication

**Participants**

- 80 teams

**Outcomes**

- Improved CTS and CATS scores indicating increased teamwork and communication
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</tr>
</thead>
<tbody>
<tr>
<td>Descriptive Study</td>
<td>Conveniences sample from four medical-surgical units in large suburban hospitals with 20-35 beds with 21-28 RNs staffed</td>
<td>Mock code simulation</td>
<td>Relationship between mock code percentage scores and unit variables, relationship between mock code percentage scores and RN responder demographic variables, self-confidence</td>
<td>Descriptive, ANOVA, Pearson correlation coefficient</td>
</tr>
</tbody>
</table>

<p>| Non-experimental | n/a | n/a | n/a | n/a | Debriefing helps participants understand their performance. Debriefing reinforces learning. Various tools are available for debriefing leaders to use and one example is the GAS method. | Non-experimental | Level III; Quality Grade A |</p>
<table>
<thead>
<tr>
<th>Reference</th>
<th>Study Type</th>
<th>Methodology</th>
<th>Study Details</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rajeswaran, L., Cox, M., Moeng, S., &amp; Tsimka, B. M. (2018). <em>African Journal of Primary Health Care &amp; Family Medicine, 10</em>(1)1-6</td>
<td>Quantitative, Quasi-Experimental study</td>
<td>Three hospitals in Botswana; non-probability convenience sample; 154 nurses; the 3 hospitals included serve populations of approximately 50,000 to 70,000 and admit general medical, surgical, pediatric, and obstetrics patients</td>
<td>Retention of CPR knowledge and skills; Pre-test, intervention, post-test design; Wilcoxon Matched-Pairs signed-rank non-parametric test</td>
<td>Decrease in CPR performance after 6 months; Limited generalizability as study was conducted in only 3 of 8 district hospitals in Botswana, education was done in 1.5 hours rather than a full day BLS course, high dropout rate</td>
</tr>
<tr>
<td>Reece, S., Cooke, C., Polivka, B., &amp; Clark, P.</td>
<td>Descriptive Study</td>
<td>37 medical-surgical nurses from community</td>
<td>Effect of high fidelity simulation training on performance data was collected during high-fidelity Mock code performance improved overall but Small sample size and one hospital</td>
<td>Level II; Quality Grade B</td>
</tr>
</tbody>
</table>
hospital in the Southeastern United States  
medical-surgical simulations; self-confidence measured using National League for Nursing Student Satisfaction and Self-Confidence in Learning Instrument  
sample t-tests  
results were not statistically significant; improved time to defibrillation; further studies to determine optimal frequency of training sessions  
limits generalizability; Strengths include that findings supported use of mock code simulations to improve performance and self-confidence;
| Sawyer, T., Eppich, W., Brett-Fleeger, M., Grant, V., & Cheng, A. (2016). *Simulation in Healthcare, 11*(3), 209-217. | Non-experimental; critical review of literature | n/a | Debriefing methods | n/a | n/a | Can debrief following simulation or during simulation; encourage discussion; avoid close-ended questions; debriefing process is a critical component of simulation experiences | Non-experimental study, but information is evidenced based best practice regarding debriefing; includes both novice and experienced simulation educators | Level V; Quality Grade A |
Appendix B

JHNEBP Model

Evidence Level and Quality Guide

<table>
<thead>
<tr>
<th>Evidence Levels</th>
<th>Quality Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I</td>
<td>Qualitative Studies</td>
</tr>
<tr>
<td>Experimental study, randomized controlled trial (RCT)</td>
<td>A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence.</td>
</tr>
<tr>
<td>Explanatory mixed method design that includes only a level I qualitative study</td>
<td>B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusion; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence.</td>
</tr>
<tr>
<td>Systematic review of RCTs, with or without meta-analysis</td>
<td>C Low quality or major flaws: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn.</td>
</tr>
<tr>
<td>Level II</td>
<td>Qualitative Studies</td>
</tr>
<tr>
<td>Quasi-experimental study</td>
<td>No commonly agreed-on principles exist for judging the quality of qualitative studies. It is a subjective process based on the extent to which study data contributes to synthesis and how much information is known about the researchers’ efforts to meet the appraisal criteria. For meta-synthesis, there is preliminary agreement that quality assessments of individual studies should be made before synthesis to screen out poor-quality studies.</td>
</tr>
<tr>
<td>Explanatory mixed method design that includes only a level II qualitative study</td>
<td>A/B High Good quality is used for single studies and meta-syntheses.</td>
</tr>
<tr>
<td>Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis</td>
<td>The report discusses efforts to enhance or evaluate the quality of the data and the overall inquiry in sufficient detail; and it describes the specific techniques used to enhance the quality of the inquiry. Evidence of some or all of the following is found in the report:</td>
</tr>
<tr>
<td>Level III</td>
<td>Qualitative Studies</td>
</tr>
<tr>
<td>Non-experimental study</td>
<td>• Transparency: Describes how information was documented to justify decisions, how data were reviewed by others, and how themes and categories were formulated.</td>
</tr>
<tr>
<td>Systematic review of a combination of RCTs, quasi-experimental and non-experimental studies, or non-experimental studies only, with or without meta-analysis</td>
<td>• Diligence: Reads and rereads data to check interpretations; seeks opportunity to find multiple sources to corroborate evidence.</td>
</tr>
<tr>
<td>Exploratory, convergent, or multiphasic mixed methods studies</td>
<td>• Verification: The process of checking, confirming, and ensuring methodologic coherence.</td>
</tr>
<tr>
<td>Explanatory mixed method design that includes only a level III qualitative study</td>
<td>• Self-reflection and scrutiny: Being continuously aware of how a researcher’s experiences, background, or prejudices might shape and bias analysis and interpretations.</td>
</tr>
<tr>
<td>Qualitative study Meta-synthesis</td>
<td>• Participant-driven inquiry: Participants shape the scope and breadth of questions; analysis and interpretation give voice to those who participated.</td>
</tr>
<tr>
<td>Level V</td>
<td>Qualitative Studies</td>
</tr>
<tr>
<td>Based on experiential and nonresearch evidence</td>
<td>A High quality: Material officially sponsored by a professional, public, or private organization or a government agency, documentation of a systematic literature search strategy; consistent results with sufficient numbers of well-designed studies; criteria-based evaluation of overall scientific strength and quality of included studies and definitive conclusions; rational expertise clearly evident; developed or revised within the past five years.</td>
</tr>
<tr>
<td>Includes:</td>
<td>B Good quality: Material officially sponsored by a professional, public, or private organization or a government agency; reasonably thorough and appropriate systematic literature search strategy; reasonably consistent results, sufficient numbers of well-designed studies; evaluation of strengths and limitations of included studies with fairly definitive conclusions; national expertise clearly evident; developed or revised within the past five years.</td>
</tr>
<tr>
<td>• Integrative reviews</td>
<td>C Low quality or major flaws: Little evidence with inconsistent results; conclusions cannot be drawn.</td>
</tr>
<tr>
<td>• Literature reviews</td>
<td>Organizational Experience (quality improvement, program or financial evaluation)</td>
</tr>
<tr>
<td>• Quality improvement, program, or financial evaluation</td>
<td>A High quality: Clear aims and objectives; consistent results across multiple settings; formal quality improvement, financial, or program evaluation methods used; definitive conclusions; consistent recommendations with thorough reference to scientific evidence.</td>
</tr>
<tr>
<td>• Case reports</td>
<td>B Good quality: Clear aims and objectives; consistent results in a single setting; formal quality improvement, financial, or program evaluation methods used; reasonably consistent recommendations with some reference to scientific evidence.</td>
</tr>
<tr>
<td>• Opinion of nationally recognized expert(s) based on experiential evidence</td>
<td>C Low quality or major flaws: Unclear or missing aims and objectives; inconsistent results; poorly defined quality improvement, financial, or program evaluation methods; recommendations cannot be made</td>
</tr>
<tr>
<td>Based on experiential and nonresearch evidence</td>
<td>A High quality: Expertise is clearly evident; draws definitive conclusions; provides scientific rationale; thought leader(s) in the field.</td>
</tr>
<tr>
<td>Includes:</td>
<td>B Good quality: Expertise appears to be credible; draws fairly definitive conclusions; provides logical argument for opinions.</td>
</tr>
<tr>
<td>• Integrative reviews</td>
<td>C Low quality or major flaws: Expertise is not discernable or is dubious; conclusions cannot be drawn</td>
</tr>
</tbody>
</table>

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Appendix C

Levels of Evidence

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Grade</th>
<th>Grade Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td>III</td>
<td>14</td>
<td>B</td>
</tr>
<tr>
<td>V</td>
<td>1</td>
<td>C</td>
</tr>
</tbody>
</table>

=18

=18
Appendix D

Permission for Use

JHNEBP MODEL AND TOOLS-PERMISSION

Thank you for your submission. We are happy to give you permission to use the JHNEBP model and tools in adherence of our legal terms noted below:

- You may not modify the model or the tools without written approval from Johns Hopkins.
- All reference to source forms should include “©The Johns Hopkins Hospital/The Johns Hopkins University.”
- The tools may not be used for commercial purposes without special permission.
Appendix E

T-TAQ Questionnaire

TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ)

**Instructions:** Please respond to the questions below by placing a check mark (✓) in the box that corresponds to your level of agreement from Strongly Disagree to Strongly Agree. Please select only one response for each question.

<table>
<thead>
<tr>
<th><strong>Team Structure</strong></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is important to ask patients and their families for feedback regarding patient care.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>2. Patients are a critical component of the care team.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>3. This facility's administration influences the success of direct care teams.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>4. A team's mission is of greater value than the goals of individual team members.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>5. Effective team members can anticipate the needs of other team members.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>6. High performing teams in health care share common characteristics with high performing teams in other industries.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Leadership</strong></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>7. It is important for leaders to share information with team members.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>8. Leaders should create informal opportunities for team members to share information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>9. Effective leaders view honest mistakes as meaningful learning opportunities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>10. It is a leader's responsibility to model appropriate team behavior.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>11. It is important for leaders to take time to discuss with their team members plans for each patient.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>12. Team leaders should ensure that team members help each other out when necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

PLEASE CONTINUE TO THE NEXT PAGE
<table>
<thead>
<tr>
<th>Situation Monitoring</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Individuals can be taught how to scan the environment for important situational cues.</td>
<td></td>
</tr>
<tr>
<td>14. Monitoring patients provides an important contribution to effective team performance.</td>
<td></td>
</tr>
<tr>
<td>15. Even individuals who are not part of the direct care team should be encouraged to scan for and report changes in patient status.</td>
<td></td>
</tr>
<tr>
<td>16. It is important to monitor the emotional and physical status of other team members.</td>
<td></td>
</tr>
<tr>
<td>17. It is appropriate for one team member to offer assistance to another who may be too tired or stressed to perform a task.</td>
<td></td>
</tr>
<tr>
<td>18. Team members who monitor their emotional and physical status on the job are more effective.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mutual Support</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19. To be effective, team members should understand the work of their fellow team members.</td>
<td></td>
</tr>
<tr>
<td>20. Asking for assistance from a team member is a sign that an individual does not know how to do his/her job effectively.</td>
<td></td>
</tr>
<tr>
<td>21. Providing assistance to team members is a sign that an individual does not have enough work to do.</td>
<td></td>
</tr>
<tr>
<td>22. Offering to help a fellow team member with his/her individual work tasks is an effective tool for improving team performance.</td>
<td></td>
</tr>
<tr>
<td>23. It is appropriate to continue to assert a patient safety concern until you are certain that it has been heard.</td>
<td></td>
</tr>
<tr>
<td>24. Personal conflicts between team members do not affect patient safety.</td>
<td></td>
</tr>
</tbody>
</table>

PLEASE CONTINUE TO THE NEXT PAGE
### TeamSTEPPS 2.0

#### Teamwork Attitudes Questionnaire

<table>
<thead>
<tr>
<th>Communication</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. Teams that do not communicate effectively significantly increase their risk of committing errors.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Poor communication is the most common cause of reported errors.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Adverse events may be reduced by maintaining an information exchange with patients and their families.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. I prefer to work with team members who ask questions about information I provide.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. It is important to have a standardized method for sharing information when handing off patients.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. It is nearly impossible to train individuals how to be better communicators.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please provide any additional comments in the space below.

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Thank you for your participation!
The Implementation of Mock Code Simulations Guided by TeamSTEPPS® 2.0 Curriculum to Improve Nurses’ Attitudes Towards Teamwork and Team Performance During Cardiac Arrest: Methodology

BY

Janelle Kriz

A paper submitted in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

South Dakota State University

2020
Abstract

Background: Effective interdisciplinary teamwork and communication are necessary to provide high-quality patient care when caring for patients in cardiac arrest.

Methods: Nurses willing to participate completed the pre-intervention T-TAQ questionnaire. TeamSTEPPS® education was given to participants before the first simulation experience. Two simulations were held six weeks apart. Each simulation was followed by a debriefing session. The T-TAQ was then administered again to the sample following the second simulation experience.

Results: At the 5% level of significance, zero of the five constructs within the T-TAQ were found to have a statistically significant improvement. However, the mean time from recognition of cardiac arrest to initial defibrillation and the mean time from initiation of chest compressions to initial defibrillation decreased from the first simulation to the second simulation.

Discussion: Although the results of this project were not statistically significant, clinical significance was achieved as evidenced by a decrease in mean time from recognition of cardiac arrest to initial defibrillation and the mean time from initiation of chest compressions to initial defibrillation.

Implications for Practice: The implementation of mock code simulations has the potential to improve outcomes when caring for patients in cardiac arrest.

Keywords: cardiac arrest, mock code simulation, debriefing, TeamSTEPPS
MOCK CODE SIMULATION

The Implementation of Mock Code Simulations Guided by TeamSTEPPS® 2.0 Curriculum to Improve Nurses’ Attitudes Towards Teamwork and Team Performance During Cardiac Arrest

The quality of care delivered to patients in the first minutes of cardiac arrest can greatly affect patient outcomes. Cardiac arrests are unpredictable and can cause high levels of stress and anxiety for the registered nurses (RNs) caring for these patients, leading to adverse patient outcomes. Nurses can experience high levels of anxiety when they lack hands-on experience with code situations, which can then negatively impact their confidence and ability to properly care for patients in cardiac arrest (Herbers & Heaser, 2016; Hickman, 2016; Reece, Cooke, Polivka, & Clark, 2016).

Background/Purpose

An estimated 475,000 Americans die each year from cardiac arrest. There were approximately 209,000 in-hospital cardiac arrests in 2016 with an adult survival rate of 24.8% (American Heart Association [AHA], 2019). Similarly, the Centers for Disease Control and Prevention (CDC) (2017) suggests an in-hospital cardiac arrest survival rate of 10.0% to 23.9%. Evidence has shown basic life support (BLS) and advanced cardiac life support (ACLS) training alone is often inadequate to properly prepare bedside nurses to respond to and care for patients in cardiac arrest. The use of mock code simulations can improve communication, teamwork, knowledge retention and confidence by allowing nurses to utilize and practice their skills when caring for patients in cardiac arrest (Crowe, Ewart, & Derman, 2018; Herbers & Heaser, 2016; Hickman, 2016; Karnish, Shustack, Brogan, Capitano, & Cunfer, 2019; Reece et al., 2016). Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS®) 2.0 curriculum can be utilized
by healthcare organizations to improve communication and teamwork among participants (AHRQ, 2019).

This quality improvement project (QIP) utilized two high-fidelity mock code simulations guided by TeamSTEPPS 2.0 curriculum with the goal of improving attitudes towards teamwork and team performance in RNs on a combined medical/surgical unit. High-fidelity simulation is defined as the use of simulation experience to provide realistic and interactive learning opportunities through the use of any mode of simulation including human, manikin, or virtual reality (Agency for Healthcare Research and Quality [AHRQ], 2016).

**PICOT question.** The PICOT question used for this QIP was: In RNs on a 31-bed combined medical/surgical inpatient unit (P) does the implementation of two mandatory mock code simulations guided by TeamSTEPPS 2.0 curriculum (I) compared to current practice with no TeamSTEPPS 2.0 curriculum education or use of mock code simulations (C) improve nurses’ attitudes towards teamwork and team performance when caring for patients in cardiac arrest (O) over a 6-week period (T)?

**Evidence findings.** Nurses are often the first to identify and recognize patients in cardiac arrest in the hospital setting, thus supporting the importance of nurses feeling competent, confident, and comfortable when caring for these patients (Rajeswaran, Cox, Moeng, & Tsim, 2018). Teamwork, leadership, and communication can improve team performance while caring for patients in cardiac arrest (Karnish et al., 2019; O’Donoghue et al., 2015). Rajeswaran et al. (2018) found knowledge retention of cardiopulmonary resuscitation (CPR) decreases after six months’ time, supporting the need for regular CPR training. Mock code simulations provide an opportunity for nurses to practice the skills necessary to care for patients in cardiac arrest (Crowe et al., 2018; Herbers &
Heaser, 2016; Hickman, 2016; Reece et al., 2016). The use of code simulations promotes muscle memory through hands-on experience and should be followed by a debriefing session to ensure the participants have gained knowledge and value in their experience. Debriefing sessions are one of the most important aspects of a simulation experience (Herbers & Heaser, 2016; Phrampus & O’Donnell, 2013). Judd, Currie, Dodds, Fethney, and Gordon (2019) found improved nurse comfort and confidence when successive simulation scenarios were used. A quasi-experimental pilot study by Morton, Powers, Jordan, and Hatley (2019) found improved nurse performance as well as a decreased mean time to defibrillation with the use of high-fidelity mock code simulations.

**Recommendations for practice.** Simulation experiences allow for a realistic learning opportunity by allowing participants to practice clinical skills, improving retention of knowledge and skills (Judd et al., 2019; Kiernan, 2018). The use of high-fidelity simulation experiences is recommended to prepare medical and surgical nurses to adequately care for patients in cardiac arrest (Morton et al., 2019). Teamwork and communication are necessary aspects of effective performance when caring for those in cardiac arrest. Simulations provide an opportunity for individuals to improve teamwork and communication while practicing hands-on skills (Karnish et al., 2019; O’Donoghue et al., 2015).

**Gaps.** Limited published studies that focus on teamwork as a primary outcome of mock code simulations were available. Evidence was also lacking regarding the use of mock code simulations on medical-surgical units in rural facilities. A specific time recommendation from the beginning of chest compressions to defibrillation was an identified gap within the literature.
Methods

**Framework, theories, and models.** The evidence-based practice model utilized to guide this project was Johns Hopkins Evidence-based Practice (JHEBP) Model and Guidelines (Dang & Dearholt, 2017). The Theoretical Domains Framework (Michie et al., 2005) guided this project during the simulation experience. The debriefing portion of this project addressed nurses’ emotions, social influences, and environmental constraints, which are all domains within this framework. The Social Cognitive Theory (Bandura, 1986) was utilized as this project’s change theory.

**Setting.** The project took place on a 31-bed combined medical/surgical unit in a rural hospital located in the Northern Plains. The community has an estimated population of 22,869, with 91.9% of the population being Caucasian, followed by 5% Hispanic and 3.2% Native American (United States [US] Census Bureau, 2018). The unit has not previously provided mock code simulation opportunities. The nurses are required to maintain their ACLS certification but have lacked opportunities to practice skills necessary for code situations. It is not often that nurses on the combined medical/surgical unit experience caring for patients in cardiac arrest, making many of them uncomfortable when the situation arises (A. Bottolfson, personal communication, June 26, 2019). The unit had 39 codes occur in 2019 (C. Mastalir, personal communication, December 2, 2019). The typical ratio on this unit is five patients to one nurse with an average daily census of 25 patients (A. Bottolfson, personal communication, June 26, 2019). The nurses care for a wide variety of diagnoses, including but not limited to the following: stable trauma, chest pain, congestive heart failure, pneumonia, sepsis, and a wide variety of stable post-surgical patients. Provider services are in-house 24-hours a day and consist of one medical doctor and one nurse practitioner.
MOCK CODE SIMULATION

**Sample.** The project utilized a convenience sample of RNs from the combined medical/surgical unit where there are 44 nurses employed. There were 27 participants in the mock code simulations, but only 13 attended both simulation sessions. Two participants who attended both simulations did not want to complete the second TeamSTEPPS teamwork attitudes questionnaire (T-TAQ) questionnaire, resulting in a sample size of 11 participants. All participants who were RNs and current with their ACLS certification completed the T-TAQ questionnaires and were included in the data collection. Participants who were not RNs or had lapsed ACLS certification were excluded from the data collection as those participants would not be familiar with defibrillator use or medication administration under the ACLS guidelines. The participants ages ranged from 22 to 66 years old; there were nine female and two male participants.

**Intervention Tools**

**Pre-simulation education.** TeamSTEPPS 2.0 curriculum was developed by the AHRQ and the Department of Defense (DoD) to improve collaboration and communication within healthcare systems. The TeamSTEPPS resource toolkit is available in the public domain and permission for its use is not required (see Appendix C). The TeamSTEPPS approach is based on over 30 years of research from highly reliable organizations including military operations, aviation, community emergency response services, and nuclear power. The curriculum was developed after combining best practices from research and was created to meet organizational needs. The education can be tailored to meet the needs of the facility (AHRQ, 2019). The Doctor of Nursing Practice (DNP) Project Manager completed the online TeamSTEPPS 2.0 curriculum training before the implementation of this project.
MOCK CODE SIMULATION

Simulation. Standardized mock code simulations were implemented to provide experiential learning for participants to help determine if nurses’ attitudes towards teamwork and communication were improved when caring for patients in cardiac arrest. The simulation utilized the high-fidelity mannequin located within the facility. Following the International Nursing Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice: Simulation\textsuperscript{SM}, two code scenarios were developed for this project by the DNP Project Manager to ensure the simulation experiences met the identified objectives in order to reach the expected outcomes of the project (INACSL Standards Committee, 2016b). The National League for Nursing Simulation Innovation Resource Center’s (SIRC) simulation design template was utilized to create the simulation experiences (see Appendix D). The template is available in the public domain, and permission for use is not required (see Appendix E). The scenarios were reviewed with a Certified Healthcare Simulation Educator as well as an ACLS instructor to determine content validity. The DNP Project Manager completed online simulation and debriefing training modules through George Washington University which focused on the standards of best practice for implementing simulation and debriefing (see Appendix F).

The simulation portion of this project was led by the facility’s nurse educator, who had previously been trained to lead simulations and utilize simulation equipment at the local college of nursing. She has approximately three years of experience leading simulations. According to the INACSL Standards of Best Practice regarding facilitating simulation, the simulation experience should be led by an individual who has experience leading and knowledge in simulation. Simulations should be appropriate for the level of knowledge and experience of the participants, include a pre-brief to prepare participants,
and participants should be guided during and after the simulation to help participants achieve the expected outcomes (INACSL Standards Committee, 2016c).

**Debriefing.** A debriefing session was conducted immediately following each simulation experience utilizing the gather-analyze-summarize (GAS) debriefing method developed by John O’Donnell and a team of collaborators at the University of Pittsburgh Medical Center’s Winter Institute for Simulation, Education and Research (WISER) Simulation Center (see Appendix G). WISER Simulation Center collaborated with the AHA in 2009 to develop this structured and supported model that was specifically designed for ACLS scenarios. The tool promotes self-reflection and encourages reflection of professional experiences and motivation to enhance the learning of participants (Phrampus & O’Donnell, 2013). This tool can easily be utilized by both novice and experienced debriefing leaders. Permission for the use of this tool was obtained (see Appendix H). The debriefing was led by the DNP Project Manager, who was able to devote concentrated attention on participants’ performance during the simulation experience. This aligns with the INACSL Standards of Best Practice in simulation debriefing (INACSL Standards Committee, 2016a).

**TeamSTEPPS Teamwork Attitudes Questionnaire.** The T-TAQ was developed by the AHRQ to measure attitudes towards teamwork (see Appendix I). This tool is in the public domain, and permission is not required if alterations are not being made to the content (see Appendix C). The questionnaire was created by multiple item writers who had experience in survey development and had knowledge regarding the principles of teamwork. Items were linked to each of the TeamSTEPPS constructs, including leadership, situation monitoring, mutual support, and communication. A pilot version of the T-TAQ was administered to military healthcare providers as well as participants at a
MOCK CODE SIMULATION

Mid-Atlantic critical care conference. Data analysis was conducted from a sample of 449 questionnaires. Classical item statistics were utilized for the selection of the final items to be included in the T-TAQ. Of the items included in the questionnaire, reliability exceeded 0.7, and scales were found to be moderately correlated (Baker, Amodeo, Krokos, Slonim, & Herrera, 2010).

**Procedure.** This project was approved by the facility after the key stakeholder was identified (see Appendix B). Participation in the simulation was mandatory for all nurses and patient care techs who did not have an excused absence by the unit director. Participation in the data collection process was strictly voluntary with recruitment being conducted by the DNP Project Manager. Willing participants completed the demographic survey and initial T-TAQ questionnaire. They were then educated for 30 minutes by the DNP Project Manager on TeamSTEPPS 2.0 curriculum using ready-to-use PowerPoints regarding teamwork and communication. The TeamSTEPPS 2.0 curriculum was only provided prior to the first simulation (see Appendix J).

The simulations were led by the facility’s nurse educator in an empty patient room located on the facility’s previous medical floor. A standardized pre-briefing was given to each group and included the simulation objectives (see Appendix D). A separate standardized code simulation scenario was utilized for the two code simulations. Both simulations were stopped after the delivery of three defibrillations or 20 minutes, whichever came first. At the request of the unit director, six sessions were held throughout a one-day period, and again six weeks later. Participants signed up for a time to participate. Each group was comprised of six to seven nurses and one or two patient care techs. Hospitalists were invited to attend, however due to staff shortage at the time of the intervention, they were unable to participate. Roles were assigned and delegated by
MOCK CODE SIMULATION

the nurse leading the code. The DNP Project Manager used a stopwatch to measure the following: mean time from recognition of cardiac arrest to initiation of chest compressions, mean time from recognition of cardiac arrest to initial defibrillation, and mean time from initiation of chest compressions to initial defibrillation to determine if the project had a positive impact on these outcomes. The same simulation scenario was given to all participants for the first simulation experience with a different scenario given for the second simulation experience. Participants were asked to keep all aspects of the simulation experience confidential to ensure the following groups’ performance was not affected. Participants were only allowed to attend one simulation experience in the first session, and one simulation experience in the second session held six weeks later.

Following the simulation, participants were moved to a conference room for debriefing. Twenty minutes was dedicated for the debriefing session with each session lasting approximately 15 minutes. The debriefing was led by the DNP Project Manager utilizing the GAS debriefing method. A review of events, team performance, what went well, and what did not go well during the simulation was discussed. The T-TAQ questionnaire was completed for the second time following the debriefing portion of the second simulation experience by willing participants. The pre and post-intervention T-TAQ questionnaires were utilized to compare responses prior to the intervention to those after the implementation of the project.

Data collection. Participants were asked to code their questionnaire in the space provided at the top of the document with their middle initial and last four numbers of their cell phone number for matching purposes. Participants were also asked to complete a demographic survey prior to the first simulation (see Appendix K). This was completed with the pre-intervention questionnaire and was not completed again following the
second simulation. Participants were informed their consent was implied by the completion of each item. The same T-TAQ questionnaire was completed at the end of the second simulation session. They were asked to code the post-intervention questionnaire in the same fashion as the first to allow for matching.

**Ethical considerations.** Approval was sought through the university to determine if this project required institutional review board (IRB) approval and it was determined this project did not include human subjects research and university IRB approval was not required (see Appendix A). The project was approved by the facility’s nursing research council (see Appendix L). Once the T-TAQ questionnaires were completed, they were gathered immediately following the intervention and stored together in a secure locked location with only the DNP Project Manager having access.

**Results**

**Demographics.** Eight participants had a baccalaureate degree in nursing while three were associates prepared nurses. Experience working as a registered nurse and years of experience on a medical or surgical unit ranged from half a year to 44 years. The 11 participants for which data was analyzed were Caucasian. Eight of the participants had performed chest compressions while working as a nurse while three had never performed chest compressions. The same number of participants had participated in a code while the remaining three had never been present when caring for a patient in cardiac arrest. Eight participants had participated in high-fidelity simulation training in the past and three had no experience. None of the participants had ever received TeamSTEPPS training.

**Statistical results.** The statistical analysis was performed by the DNP Project Manager under the guidance of a statistics professor. The Wilcoxon signed-rank nonparametric test was used to analyze the data from the dependent matched
questionnaire pairs. The 5% level of significance was used to determine if the results of pre and post intervention questionnaires were statistically significant. The questionnaire included Likert style responses from strongly disagree to strongly agree (1=strongly disagree, 5=strongly agree). Excel was utilized to calculate the average score within each construct for each participant. The PROC UNIVARIATE procedure of the Statistical Analysis Software (SAS) program was utilized to calculate the p-value for each of the five constructs utilizing the Wilcoxon signed-rank nonparametric test. At the 5% level of significance, the p-value was calculated for each construct. The calculated p-values found for each construct include the following: team structure $p=0.7500$, leadership $p=0.1563$, situation monitoring $p=0.2500$, mutual support $p=1.0000$, and communication $p=0.9688$. Of the five constructs, none were found to have a p-value of less than 0.05, therefore indicating the results were not statistically significant.

**Secondary outcomes.** While the mean time from recognition of cardiac arrest to initiation of chest compressions increased by 12 seconds from the first simulation to the second simulation, the mean time from recognition of cardiac arrest to initial defibrillation decreased from 125.25 seconds to 113 seconds. This demonstrated an improvement of 12.25 seconds. The mean time from initiation of chest compressions to initial defibrillation also improved from 115.25 seconds during the first simulation to 91 seconds during the second simulation, showing an improvement of 24.25 seconds. The improvement of time indicates the potential for improvement of patient outcomes when defibrillation is occurring sooner.

Although statistical significance was not achieved, clinical significance was recognized in statements from participants during the debriefing portion of this project, indicating a positive perception of the mock code simulations (see Appendix N). Three
participants asked when more simulations would be held following the final simulation for this project. Three nurses stated they felt more comfortable operating the defibrillator following the code simulations while multiple nurses stated they felt more confident in caring for patients in cardiac arrest.

Discussion

Two participants chose not to complete the questionnaire following the second simulation and not all participants attended both sessions, leading to a smaller sample size. High levels of stress may have affected participants’ performance during the mock code simulation as well as their response to the questionnaires. A barrier to this project was hospitalists being unable to participate due to a staffing shortage at the time of the intervention. However, it was identified by the key stakeholder that this may have been beneficial as this required the participants to perform independently without the hospitalists’ direction. It is also possible participants who were more comfortable with each other signed up for the same simulation time, affecting their communication and comfort level at baseline. The project was initially planned to occur at a local college within a simulation lab, however, prior to implementation it was determined this was no longer available for use for this project. Lack of adequate time for the delivery of the pre-simulation TeamSTEPPS education due to time constraints was also a barrier as it is often delivered over a much longer time period.

Although the project results were not statistically significant, there were significant secondary outcomes indicated by a decreased mean time from recognition of cardiac arrest to initial defibrillation and a decreased mean time from initiation of chest compressions to initial defibrillation. These results suggest the potential to improve patient outcomes when caring for patients in cardiac arrest. Although this project had a
small sample size, it has laid the foundation for the facility to continue the mock code simulations as well as implement simulations within other units. The TeamSTEPPS 2.0 curriculum can be applied to many areas of patient care including patient hand-offs or communication with providers. The results of this project are not generalizable to other facilities but may offer suggestions to implement simulations in similar settings.

Implications for Practice

Impact on organization. This QIP has implications for the facility as well as for improving the quality of care delivered to an underserved rural population. The continuation of mock code simulations may have the potential to improve nurses’ overall communication with team members when caring for all patients, not just when caring for those in cardiac arrest. There is also the potential to improve teamwork in other areas of patient care, including improved communication during patient hand off or between nurses and leadership members who are on the combined medical/surgical floor.

Based on the positive feedback received from participants and the key stakeholder, the continuation of mock code simulations may improve care that is delivered to patients in cardiac arrest as well as improve overall communication among staff on the combined medical/surgical unit. Participants expressed satisfaction with not having to travel for this continuing education opportunity.

Facility support and cost. This project was fully supported by the director of the medical/surgical unit, as well as the Vice President of Patient Care Services. The paper and ink utilized for the pre and post-intervention questionnaires were the responsibility of the DNP Project Manager. The use of all other tools utilized for this project were of no cost to the DNP Project Manager or facility. The participants were paid by the facility for their time spent participating in the project. No additional incentives were given to
participants for their participation in this project. The equipment used for the simulations were property of the hospital and no further equipment needed to be purchased.

**Recommendations for further projects and sustainability.** The key stakeholder for this project plans to continue the mock code simulations long term based on the positive feedback from participants and the nurse educator during quarterly competency days making the project sustainable. Further projects could be done focusing on the mock code simulations with larger samples. A possibility for further projects includes the comparison of a control group, a longer TeamSTEPPS 2.0 curriculum education session, or a follow-up T-TAQ four to six weeks after the post-intervention questionnaire to further determine the retention of knowledge.

**Limitations.** A limitation of this project included a small sample size, which was further reduced when two participants did not complete the second T-TAQ. Thirty minutes of TeamSTEPPS 2.0 education prior to the first simulation may not have been an adequate amount of time for the information to be presented.

**Conclusion**

The use of mock code simulations provides an opportunity for nurses to practice the skills necessary to care for patients in cardiac arrest (Crowe et al., 2018; Herbers & Heaser, 2016; Hickman, 2016; Reece et al., 2016). This project has great potential for positive change within the facility. While the Wilcoxon signed-rank nonparametric test found the results of this project were not statistically significant, the secondary outcomes of this project included a decreased mean time from recognition of cardiac arrest to initial defibrillation and decreased mean time from initiation of chest compressions to initial defibrillation. Clinical significance was further supported by the positive comments made by the participants regarding the simulations.
References


MOCK CODE SIMULATION


Retrieved from https://www.census.gov/quickfacts/yanktoncountysouthdakota
Appendix A

University IRB Approval

Your study/research/project is not Human Subjects Research. No application to the IRB is required.

Questions?
Contact us at:
sdsu.irm@sdsstate.edu
https://www.sdstate.edu/research-and-economic-development/research-compliance-human-subjects
 Appendix B
 Facility Approval

 DNP Project Stakeholder Agreement

I agree to serve as the DNP Project Stakeholder to the DNP student named in this agreement.

Name of Stakeholder:

Amanda Bottom

Signature of Stakeholder:

Signature of DNP student:

Janelle Kriz

Signature of DNP student:

date

Date:

7.19.19

Approved by Graduate Faculty 5.10.19
Permission
Amanda Bottolfson

Sent: Tuesday, June 25, 2019 2:12 PM
To: Janelle Kriz
Importance: Low

Janelle Kriz, RN has my permission to implement code simulations on the medical/surgical unit of ASHH for her DNP project. Thank you!

Amanda Bottolfson, RN, MSN
Director Medical, Surgical, Swingbed, ICU, PCS staffing
Appendix C

Permission for TTAQ and TeamSTEPPS

TeamSTEPPS® is an evidence-based teamwork program aimed at optimizing patient outcomes by improving communication and teamwork skills among health care professionals. The TeamSTEPPS 2.0 curriculum is designed to help health care leaders develop and deploy a customized plan to train their staff in teamwork skills. Organizations report improvements after implementing TeamSTEPPS; visit our Impact Case Studies to learn more.

In addition to TeamSTEPPS 2.0, AHRQ offers ready-to-use curricula, including the core curriculum, as well as specialty modules for office-based care providers, long-term care settings, and rapid response teams. A TeamSTEPPS Pocket Guide is available through our mobile app.

The TeamSTEPPS 2.0 modules are in the public domain for noncommercial use within the United States, and you may download the complete set of PowerPoint slides. For commercial use (reproduction and distribution for sale), use outside the United States, and translation of TeamSTEPPS 2.0 into a foreign language, written permission from AHRQ's Office of Communications is required.

Master trainers are encouraged to share their knowledge with colleagues and to use official TeamSTEPPS materials as follows:

- Include the registered trademark symbol (®), as shown above.
- Retain the content without any major substantive changes to the text or tools. For example, TeamSTEPPS includes a tool called CUS, which is an acronym for "Concerned," "Uncomfortable," and "Safety Issue." This content must remain the same (no changes to letters or words) for your training to use the TeamSTEPPS name.
- Modify examples and case studies, which are provided as teaching tools, to reflect your organization's experience.
- Add your organization's name and logo.
- Change images to include scenes from your work or other appropriate images.
- Translate the curriculum into another language or change spelling to British English.

Customizing the materials for your organization is permissible. You may make the following changes and still use the TeamSTEPPS name:

In addition, citation of the source is appreciated. Include as a footnote: TeamSTEPPS was developed by the Agency for Healthcare Research and Quality. For more information, visit www.ahrq.gov/teamstepps.
Appendix D

Simulations

Simulation Design Template
(revised May 2019)
(Bob) Simulation

Date: TBD
Discipline: Med/surg
Nursing/PCTs/Hospitalists
Expected Simulation Run Time: 20 mins

Location: Mt. Marty Simulation Lab
Today's Date: 09-15-19
Guided Reflection: GAS debriefing
Location for Reflection: TBD

Brief Description of Client

Name: Bob Jones
Date of Birth: 7-5-1935
Gender: Male    Age: 84    Weight: 100.9kg    Height: 5'10"
Race: Caucasian    Religion: Catholic
Major Support: Marlene Jones (lives in a nursing home/dementia) Support Phone: 777-777-7777
Allergies: Sulfur Antibiotics
Immunizations: Up-to-date
Attending Provider/Team: Hospitalists
Past Medical History: hypertension, type 2 diabetes, hyperlipidemia
History of Present Illness: Patient was admitted to the medical floor two days ago after being found to have a pulmonary embolism. He was started on IV heparin, and transitioned to oral anticoagulation today. His hospitalization has been uneventful, and is being discharged home today. He was requiring 2L of oxygen on admission, but has been on room air for 24 hours. You are going into the room to go over his discharge instructions and remove his saline lock.
Social History: Retired truck driver
Primary Medical Diagnosis: pulmonary embolus
Surgeries/Procedures & Dates: cholecystectomy 2009


This Simulation Design Template may be reproduced and used as a template for the purpose of adding content for specific simulations for non-commercial use as long as the NLN copyright statement is retained on the Template. When used for this purpose, no specific permission is required from the NLN.
Psychomotor Skills Required of Participants Prior to Simulation
1. BLS (patient care techs) or ACLS (nurses and hospitalists)
2. Patient care techs with proper technique of obtaining vital signs
3. Nurses with the ability to start IV, administer IVP medications, and operate IV pumps
4. Nurse and hospitalists able to operate manual defibrillator

Cognitive Activities Required of Participants Prior to Simulation
(TeamSTEPPS 2.0 education provided to group immediately prior to simulation)

Simulation Learning Objectives

General Objectives
1. Perform priority nursing actions based on assessment and clinical data.
2. Reassess/monitor patient status following nursing interventions.
3. Communicate appropriately with other health care team members in a timely, organized, patient-specific manner.

Simulation Scenario Objectives (limit to 3 or 4)
1. Recognize the patient in cardiac arrest (not shared with participants prior to simulation).
2. Follow ACLS guidelines when caring for a patient in cardiac arrest (nurses and hospitalists).
3. Communicate effectively as a team using closed loop communication.
4. Identify aspects of teamwork and communication necessary when caring for the patient in cardiac arrest (not shared with participants prior to simulation).
For Faculty: References, Evidence-Based Practice Guidelines, Protocols, or Algorithms Used for This Scenario:

---

Simulation Design Template (revised May 2019)
© 2019, National League for Nursing
## Setting/Environment

- [ ] Emergency Room
- [ ] ICU
- [ ] Medical-Surgical Unit
- [ ] OR / PACU
- [ ] Pediatric Unit
- [ ] Rehabilitation Unit
- [ ] Maternity Unit
- [ ] Home
- [ ] Outpatient Clinic
- [ ] Behavioral Health Unit
- [ ] Other:

## Equipment/Supplies

**Simulated Patient/Manikin/s Needed:** Yes

### Other Props & Moulage:

<table>
<thead>
<tr>
<th>Equipment Attached to Manikin/Simulated Patient:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ ID band</td>
</tr>
<tr>
<td>☐ IV tubing with primary line fluids running at _mL/hr</td>
</tr>
<tr>
<td>☐ Secondary IV line running at _mL/hr</td>
</tr>
<tr>
<td>☐ IVPS with _mL/hr running at ml/hr</td>
</tr>
<tr>
<td>☐ IV pump</td>
</tr>
<tr>
<td>☐ PCA pump</td>
</tr>
<tr>
<td>☐ Foley catheter with _mL output</td>
</tr>
<tr>
<td>☐ 02</td>
</tr>
<tr>
<td>☐ Monitor attached</td>
</tr>
<tr>
<td>☐ Other: saline lock</td>
</tr>
</tbody>
</table>

**Equipment Available in Room:**

- ☐ Bedpan/urinal
- ☐ O2 delivery device (ambu-bag)
- ☐ Foley kit
- ☐ Straight catheter kit
- ☐ Incentive spirometer
- ☐ Fluids
- ☐ IV start kit
- ☐ IV tubing
- ☐ IVPS tubing
- ☐ IV pump
- ☐ Feeding pump
- ☐ Crash cart with airway devices and emergency medications
- ☐ Defibrillator/pacer
- ☐ Suction
- ☐ Other:

### Other Essential Equipment:

<table>
<thead>
<tr>
<th>Medications and Fluids:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Oral Meds:</td>
</tr>
<tr>
<td>☐ IV Fluids:</td>
</tr>
<tr>
<td>☐ IVPS:</td>
</tr>
<tr>
<td>☐ IV Fluids:</td>
</tr>
<tr>
<td>☐ IM or SC:</td>
</tr>
</tbody>
</table>

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*Simulation Design Template* (revised May 2019)
© 2019, National League for Nursing
### Roles

- Nurse 1
- Nurse 2
- Nurse 3
- Provider (physician/advanced practice nurse)
- Other healthcare professionals: (pharmacist, respiratory therapist, etc.)
- Observer(s)
- Recorder(s)
- Family member #1
- Family member #2
- Clergy
- Unlicensed assistive personnel
- Other:

### Guidelines/Information Related to Roles

Nurses will volunteer to be primary nurse, one of two secondary nurses, an observer, or recorder. Nurses are responsible for delegating tasks to the unlicensed assistive personnel which can include obtaining needed supplies, or recording etc.

### Pre-briefing/Briefing

Nurses will be oriented to simulation lab including orientation to the crash cart. Attachment device will allow nurses to practice defibrillation during simulation.

"Nurses can volunteer to perform as the primary nurse, or one of two secondary nurses including an observer, or recorder. The observer is to watch for things that are done well and areas for improvement from a team member’s perspective. Patient care techs will perform tasks delegated to them by the primary nurse, and this can include recording, if primary nurse wishes to have that RN designated to other tasks."

“We are aware this is a simulation, but ask that you have an open mind and participate as you would in a real life situation. Please hold all aspects of the simulation in confidence so it does not affect other individual’s performance. Also remember this is a learning opportunity, it is not in any way expected that everyone performs perfectly. Now is the time for things to go wrong so we can learn from those mistakes, and find ways to improve when a code actually does occur on the floor.”
Report Students Will Receive Before Simulation
(Use SBAR format.)

**Person providing report:** Simulation leader

**Situation:** You are going into the room to go over his discharge instructions and remove his saline lock.

**Background:** Patient was admitted to the medical floor two days ago after being found to have a pulmonary embolism. He was started on IV heparin, and transitioned to oral anticoagulation today. His hospitalization has been uneventful, and is being discharged home today. He was requiring 2L of oxygen on admission, but has been on room air for 24 hours. You are going into the room to go over his discharge instructions and remove his saline lock. He is a full code.

**Assessment:** (NOT SHARED WITH PARTICIPANTS) Patient is found to be pulseless when nurse enters room.

**Recommendation:** (NOT SHARED WITH PARTICIPANTS) Follow ACLS guidelines for pulseless ventricular fibrillation.
# Scenario Progression Outline

**Patient Name:** Bob Jones  
**Date of Birth:** 7-5-1965

<table>
<thead>
<tr>
<th>Timing (approx.)</th>
<th>Manikin/SP Actions</th>
<th>Expected Interventions</th>
<th>May Use the Following Cues</th>
<th>Role member providing cue: Hospitalist will enter room 3 minutes after code has been called overhead</th>
</tr>
</thead>
</table>
| 0-5 min          | When RN enters room patient is lying in bed and does not respond to RN.  
*If pulse check is performed prior to 5 minutes, patient is found to be in ventricular fibrillation.* | • Attempt to arouse patient  
• Check for pulse and breathing for no longer than 10 seconds  
• Initiate CPR (100-120 compression/minute) and call for help  
• 30:2 compressions to breath without advanced airway  
• Perform pulse check every 2 minutes  
• Rotate compressors every 2 minutes or sooner if fatigued  
• Adhere to ACLS guidelines | | |
| 5-10 min         | *Allow participants to perform three cycles of CPR rotations each of which the rhythm check will show ventricular fibrillation, after the 3rd delivered shock, ROSC.* | • Perform pulse check every 2 minutes  
• Rotate compressors every 2 minutes  
• Administer epinephrine every 3-5 minutes  
• Adhere to ACLS guidelines | | |
| 10-15 min        | *Continue CPR if 3 shocks have not yet been delivered.* | • Adhere to ACLS guidelines | | |
| 15-20 min        | *If 3 shocks have not been delivered by 20 minutes, regardless where they are at in the simulation, the simulation will stop at the 20 minute mark.* | • Once ROSC is achieved, decision to transfer patient should be verbalized. | | |

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*Simulation Design Template (revised May 2019)*  
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Simulation Design Template
(revised May 2019)

(Joseph) Simulation

Date: TBD
Discipline: Med/surg
Nursing/PCTs/Hospitalists
Expected Simulation Run Time: 20 mins

Location: Mt. Marty Simulation Lab
Today's Date: 09-18-19
Guided Reflection: GAS debriefing
Location for Reflection: TBD

Brief Description of Client

Name: Joseph Jones

Date of Birth: 7-1-1947

Gender: M  Age: 74  Weight: 102.5kg  Height: 5'11"

Race: Caucasian  Religion: Catholic

Major Support: Widowed, son lives in California and they rarely speak, neighbor Marlene is primary support

Support Phone: 777-777-777

Allergies: NKDA  Immunizations: Up-to-date

Attending Provider/Team: Hospitalists

Past Medical History: COPD, CABG 2011, type 2 diabetes, hyperlipidemia, Heart Failure

History of Present Illness: Patient presented to the emergency department today at 2am with increased sputum production, increased shortness of breath and mild intermittent chest pain associated with exertion. Baseline oxygen requirement at night is 2L, and had increased to 3-4L 2 days prior to admission. CXR in the ED showed cardiomegaly with mild bilateral pleural effusions. His troponin was mildly elevated at .04 on presentation, and remained .04 which was checked 4 hours and 8 hours after the initial troponin. He was admitted to the medical floor for a COPD exacerbation and has been on the unit for 7 hours.

Social History: Retired farmer. 40 pack-per-year smoking history

Primary Medical Diagnosis: COPD exacerbation
Psychomotor Skills Required of Participants Prior to Simulation
1. (BLS (patient care techs) or ACLS (nurses and hospitalists))
2. Patient care techs with proper technique of obtaining vital signs
3. Nurses with the ability to start IV, administer IVF medications, and operate IV pumps
4. Nurse and hospitalists able to operate manual defibrillator

Cognitive Activities Required of Participants Prior to Simulation
(TEAMSTEPPS 2.0 education provided to group immediately prior to simulation.)

Simulation Learning Objectives

General Objectives
1. Perform priority nursing actions based on assessment and clinical data.
2. Reassess/monitor patient status following nursing interventions.
3. Communicate appropriately with other health care team members in a timely, organized, patient-specific manner.

Simulation Scenario Objectives (limit to 3 or 4)
1. Recognize the patient in cardiac arrest (not shared with participants prior to simulation).
2. Follow ACLS guidelines when caring for a patient in cardiac arrest (nurses and hospitalists).
3. Communicate effectively as a team using closed loop communication.
4. Identify aspects of teamwork and communication necessary when caring for the patient in cardiac arrest (not shared with participants prior to simulation).
For Faculty: References, Evidence-Based Practice Guidelines, Protocols, or Algorithms Used for This Scenario:

**Mock Code Simulation**

[Flowchart image]

**CPR Guideline:***
- Push hard (at least 2 inches)
- Push at a rate of 100 to 120 compressions and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressions every 2 minutes, or sooner if fatigued.
- Consider 30:2 compressions-ventilation ratio.
- Quantitative waveform capnography supported to improve CPR quality.
- Hypotension pressure
- If indication phase systolic pressure <70 mm Hg, attempt to improve CPR quality.

**Mechanical Ventilation:**
- Biphasic Barker: target ventilation/inspiration, use maximum available; set at 8 to 10 breaths per minute.
- Ventilation equivalent, set at 8 to 10 breaths per minute.
- Ventilation equivalent, set at 8 to 10 breaths per minute.
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- Ventilation equivalent, set at 8 to 10 breaths per minute.
- Ventilation equivalent, set at 8 to 10 breaths per minute.

**Medications:**
- Epinephrine (Noradrenaline) dose: 1 mg every 3 to 5 minutes.
- Amiodarone (Ameron) first dose: 1 mg/kg. Second dose: 2 mg/kg.
- Lidocaine (Xylocaine) dose: 1 mg/kg. Second dose: 1 mg/kg.
- Amiodarone (Ameron) dose: 1 mg/kg. Second dose: 2 mg/kg.

**Arrhythmia:**
- Ventricular fibrillation or pulseless ventricular tachycardia
- Ventricular tachycardia or supraventricular tachycardia
- Ventricular arrhythmia
- Vascular access
- Hypotension
- Shock
- Ventricular tachycardia
- Hypotension
- Hypovolemia
- Cardiac arrest
- Hypothermia
- Hypoxia
- Hypertension
- Hypotension
- Thrombosis, coronary

**Simulation Design Template (revised May 2019)**
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## Setting/Environment

- **Emergency Room**
- **Medical-Surgical Unit**
- **Pediatric Unit**
- **Maternity Unit**
- **Behavioral Health Unit**
- **ICU**
- **OR / PACU**
- **Rehabilitation Unit**
- **Home**
- **Outpatient Clinic**
- **Other:**

## Equipment/Supplies

**Simulated Patient/Manikin/s Needed:** Yes

### Other Props & Moulage:

<table>
<thead>
<tr>
<th>Equipment Attached to Manikin/Simulated Patient:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 10 band</td>
</tr>
<tr>
<td>- IV tubing with primary line fluids running at __mL/hr</td>
</tr>
<tr>
<td>- Secondary IV line running at __mL/hr</td>
</tr>
<tr>
<td>- IVPB with ____ running at mL/hr</td>
</tr>
<tr>
<td>- IV pump</td>
</tr>
<tr>
<td>- PCA pump</td>
</tr>
<tr>
<td>- Foley catheter with ___mL output</td>
</tr>
<tr>
<td>- O2</td>
</tr>
<tr>
<td>- Monitor attached</td>
</tr>
<tr>
<td>- Other: saline lock</td>
</tr>
</tbody>
</table>

### Other Essential Equipment:

<table>
<thead>
<tr>
<th>Medications and Fluids:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Oral Meds:</td>
</tr>
<tr>
<td>- IV Fluids:</td>
</tr>
<tr>
<td>- IVPB:</td>
</tr>
<tr>
<td>- IV Push:</td>
</tr>
<tr>
<td>- IM or SC:</td>
</tr>
</tbody>
</table>

### Equipment Available in Room:

- Bedpan/urinal
- O2 delivery device (ambu-bag)
- Foley kit
- Straight catheter kit
- Incentive spirometer
- Fluids
- IV start kit
- IV tubing
- IVPB tubing
- IV pump
- Feeding pump
- Crash cart with airway devices and emergency medications
- Defibrillator/pacer
- Suction
- Other:

---

*Simulation Design Template (revised May 2019)*
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Roles

- Nurse 1
- Nurse 2
- Nurse 3
- Provider (physician/advanced practice nurse)
- Other healthcare professionals: (pharmacist, respiratory therapist, etc.)
- Observer(s)
- Recorder(s)
- Family member #1
- Family member #2
- Clergy
- Unlicensed assistive personnel
- Other:

Guidelines/Information Related to Roles

Nurses will volunteer to be primary nurse, one of two secondary nurses, an observer, or recorder. Nurses are responsible for delegating tasks to the unlicensed assistive personnel which can include obtaining needed supplies, or recording etc.

Pre-briefing/Briefing

Nurses will be oriented to simulation lab including orientation to the crash cart. Attachment device will allow nurses to practice defibrillation during simulation.

“Nurses can volunteer to perform as the primary nurse, or one of two secondary nurses including an observer, or recorder. The observer is to watch for things that are done well and areas for improvement from a team member’s perspective. Patient care techs will perform tasks delegated to them by the primary nurse, and this can include recording, if primary nurse wishes to have that RN designated to other tasks.”

“We are aware this is a simulation, but ask that you have an open mind and participate as you would in a real life situation. Please hold all aspects of the simulation in confidence so it does not affect other individual’s performance. Also remember this is a learning opportunity, it is not in any way expected that everyone performs perfectly. Now is the time for things to go wrong so we can learn from those mistakes, and find ways to improve when a code actually does occur on the floor.”
Report Students Will Receive Before Simulation
(Use SBAR format.)

Person providing report: Simulation leader

Situation: You are walking down the hall and hear your patient care tech call for help from a patients room. When you enter the room the patient is found to be lying in bed with agonal breathing and cyanosis.

Background: Patient presented to the emergency department today at 2am with increased sputum production, increased shortness of breath and mild intermittent chest pain associated with exertion. Baseline oxygen requirement at night is 2L, and had increased to 3-4L 2 days prior to admission. CXR in the ED showed cardiomegaly with mild bilateral pleural effusions. His troponin was mildly elevated at .04 on presentation, and remained .04 which was checked 4 hours and 8 hours after the initial troponin. He was admitted to the medical floor for a COPD exacerbation and has been on the unit for 7 hours. Over the past few hours he has reported some increased chest pain without EKG changes, and troponin has remained stable.

Assessment: (NOT SHARED WITH PARTICIPANTS) Patient is found to be pulseless when nurse enters room.

Recommendation: (NOT SHARED WITH PARTICIPANTS) Follow ACLS guidelines for pulseless ventricular fibrillation.
## Scenario Progression Outline

**Patient Name:** Joseph Jones  
**Date of Birth:** 7-1-1947

<table>
<thead>
<tr>
<th>Timing (approx.)</th>
<th>Manikin/SP Actions</th>
<th>Expected Interventions</th>
<th>May Use the Following Cues</th>
</tr>
</thead>
</table>
| **0-5 min**      | On pulse check, patient is found to be pulseless and not responsive. | • Attempt to arouse patient  
• Check for pulse and breathing for no longer than 10 seconds  
• Initiate CPR (100-120 compression/minute) and call for help  
• 30:2 compressions to breath without advanced airway  
• Perform pulse check every 2 minutes  
• Rotate compressors every 2 minutes or sooner if fatigued  
• Adhere to ACLS guidelines | Role member providing cue: Hospitalist will enter room 3 minutes after code has been called overhead. |
| **5-10 min**     | *Allow participants to perform three cycles of CPR rotations each of which the rhythm check will show ventricular fibrillation, after the 3rd delivered shock, ROSC | • Perform pulse check every 2 minutes  
• Rotate compressors every 2 minutes  
• Administer epinephrine every 3-5 minutes  
• Adhere to ACLS guidelines | |
| **10-15 min**    | *Continue CPR if 3 shocks have not yet been delivered. | • Adhere to ACLS guidelines | |
| **15-20 min**    | * If 3 shocks have not been delivered by 20 minutes, regardless where they are at in the simulation, the simulation will stop at the 20 minute mark. | • Once ROSC is achieved, decision to transfer patient should be verbalized. | |

---

*Simulation Design Template (revised May 2019)*  
© 2019, National League for Nursing
Simulation Design Template - Revised May 2019

Have you been looking for an easy to use Simulation Design template? We just revised our template. Please note that you are welcome to use it, so long as it retains the SIRC information on the footer.
09/14/2019

Janelle Kriz

has successfully completed

Essentials in Clinical Simulations Across the Health Professions

an online non-credit course authorized by The George Washington University and offered through Coursera

Verify at coursera.org/verify/M1X555ECQ8X8
Coursera has confirmed the identity of this individual and their participation in the course.
Appendix G

GAS Debriefing Tool

Gather

“We are going to do a quick debrief of that simulation. The goal is to improve our performance as a team and the care we provide. Let’s start with a description of the key clinical events.”

- Review the clinical events and establish a shared mental model of what happened.

Analyze (‘plus/delta’)

“Okay team, let’s talk about our performance. What went well, and what didn’t go so well?”

- Did the team follow NRP guidelines? If not, why?
- Were there any technical, equipment, or procedural issues? If so, what?
- Discuss 2 to 3 key behavioral skills relevant to the simulation. How was team performance in these areas?

Summarize

“How can we do better next time?”

- Discuss changes in team performance that will be implemented in the future, based on discussion above.
Appendix H

GAS Permission

Phrampus, Paul
To: Janelle Kokes  Cc: O’Donnell, John
Re: Permission

Hi Janelle,

No problem. I hope it works well for you.

My best,
Paul

See More from Janelle Kokes

Janelle Kokes
To: Paul Phrampus
Permission

Dr. Phrampus,

I am currently entering my final year of my DNP program and will be beginning to work on my DNP project this fall. I am planning to implement code simulations with debriefing on our med/surg floor. I am requesting permission to use the GAS debriefing tool along with the suggested questions to guide the debriefing located on your website.

Thank you,
Janelle Kitz
Appendix I

T-TAQ Questionnaire

TeamSTEPPS® 2.0

TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ)

Instructions: Please respond to the questions below by placing a check mark (✓) in the box that corresponds to your level of agreement from Strongly Disagree to Strongly Agree. Please select only one response for each question.

<table>
<thead>
<tr>
<th>Team Structure</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>1. It is important to ask patients and their families for feedback regarding patient care.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Patients are a critical component of the care team.</td>
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<tr>
<td>3. This facility's administration influences the success of direct care teams.</td>
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<tr>
<td>4. A team's mission is of greater value than the goals of individual team members.</td>
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<tr>
<td>5. Effective team members can anticipate the needs of other team members.</td>
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<tr>
<td>6. High performing teams in health care share common characteristics with high performing teams in other industries.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Leadership</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tr>
<td>7. It is important for leaders to share information with team members.</td>
<td></td>
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<td></td>
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<tr>
<td>8. Leaders should create informal opportunities for team members to share information.</td>
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<tr>
<td>9. Effective leaders view honest mistakes as meaningful learning opportunities.</td>
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<tr>
<td>10. It is a leader's responsibility to model appropriate team behavior.</td>
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<tr>
<td>11. It is important for leaders to take time to discuss with their team members plans for each patient.</td>
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</tr>
<tr>
<td>12. Team leaders should ensure that team members help each other out when necessary.</td>
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</tr>
</tbody>
</table>

PLEASE CONTINUE TO THE NEXT PAGE
### Situation Monitoring

13. Individuals can be taught how to scan the environment for important situational cues.  
14. Monitoring patients provides an important contribution to effective team performance.  
15. Even individuals who are not part of the direct care team should be encouraged to scan for and report changes in patient status.  
16. It is important to monitor the emotional and physical status of other team members.  
17. It is appropriate for one team member to offer assistance to another who may be too tired or stressed to perform a task.  
18. Team members who monitor their emotional and physical status on the job are more effective.  

### Mutual Support

19. To be effective, team members should understand the work of their fellow team members.  
20. Asking for assistance from a team member is a sign that an individual does not know how to do his/her job effectively.  
21. Providing assistance to team members is a sign that an individual does not have enough work to do.  
22. Offering to help a fellow team member with his/her individual work tasks is an effective tool for improving team performance.  
23. It is appropriate to continue to assert a patient safety concern until you are certain that it has been heard.  
24. Personal conflicts between team members do not affect patient safety.
### Communication

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tr>
<td>25. Teams that do not communicate effectively significantly increase their risk of committing errors.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>26. Poor communication is the most common cause of reported errors.</td>
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<tr>
<td>27. Adverse events may be reduced by maintaining an information exchange with patients and their families.</td>
<td></td>
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<tr>
<td>28. I prefer to work with team members who ask questions about information I provide.</td>
<td></td>
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<tr>
<td>29. It is important to have a standardized method for sharing information when handing off patients.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>30. It is nearly impossible to train individuals how to be better communicators.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please provide any additional comments in the space below.

Thank you for your participation!
Appendix J

TeamSTEPPS 2.0 Pre-Simulation Education
Mock Code Simulation

Leading Teams

Objectives
- Describe how leadership affects team processes and outcomes
- Identify different types of team leaders
- Describe the skills involved in successfully leading teams
- Describe the tools for leading teams, including briefs, huddle, and debriefs
- Apply the tools for leading teams to specific clinical scenarios

Types of Team Leaders
- Designated - The person assigned to lead and organize a team, establish roles, and facilitate team communication and decision making
- Situational - Any team member who has the skills to manage the situation at hand

Effective Team Leaders
- Define, assign, share, monitor, and modify a plan
- Promote the team’s performance
- Establish “tone of engagement”
- Manage and allocate resources effectively
- Provide feedback regarding assigned responsibilities and progress toward the goal
- Facilitate information sharing
- Encourage team members to trust one another
- Foster conflict resolution
- Fosters effective teamwork

Assigning Tasks and Responsibilities
- Determine the tasks and responsibilities of team members
- Determine who leads and who assists and when
- Communicate expectations for task completion
- Establish clear roles and responsibilities; need to do required feedback

Sharing the Plan: Briefs
- A brief is a short, clear, and easily understood statement of the plan
- Briefs should be:
  - Clear and concise
  - Engaging and encouraging
  - Information shared
  - Encourage input and questions
  - Engaging in shared vision and planning

Reviewing the Team’s Performance: Debrief
- Process Improvement
  - Brief, informed information exchange and feedback
  - Clear after an event, or task
  - Designed to improve teamwork skills
  - Designed to improve outcomes
  - Involves feedback from the entire team
  - Reflects on the process
  - Discussion of issues learned and implemented
  - Revised plan to incorporate lessons learned

Debrief Checklist

TeamSTEPPS 2.0 | Leading Teams C-4-1
Mock Code Simulation

Appendix K

Demographic Survey

Please code your survey which will allow for matching of pre and post-intervention surveys and not allow for individual identification.

Middle Initial | Last four of cell number

<table>
<thead>
<tr>
<th>Age:</th>
<th>Gender:</th>
</tr>
</thead>
</table>

What is the highest nursing degree you have obtained? (Circle your answer):
- Licensed Practical Nurse (LPN)
- Associates Degree
- Baccalaureate Degree

During your nursing career (NOT including time during your nursing education), have you performed chest compressions? Yes No

During your nursing career (NOT including time during your nursing education), have you participated in caring for a patient in cardiac arrest? Yes No

Have you ever had experience with high-fidelity simulation training in the past (NOT including time during nursing education)? Yes No

Have you ever participated in TeamSTEPPS training in your professional career? Yes No

How many years of experience do you have as a nurse? Years:

How many years have you worked on the medical or surgical floor? Years:

What is your ethnicity?
- White/Caucasian __
- Hispanic/Latino __
- Black/African American __
- Asian __
- Prefer not to say __
- Other, please specify: __________________
Appendix L

Nursing Research Council Approval

---

Principal Investigator (PI): Janelle Kriz
Phone: 605-660-3243
Address: 11110 30th Street Tyndall, SD 57066

PI is: ☐ Undergraduate Student @ SDSU  ☐ Graduate Student @ SDSU
☐ Faculty @ Other Employee @ Avera Sacred Heart ☐ Other

Employee's manager or director (if an Avera McKennan employee): N/A

Mentor Name and Affiliation (as applies to students/residents): Dr. Bond, Researcher: SDSU

Title of Protocol/Research Study: The implementation of mock code simulations guided by TeamSTEPPS 2.0 Curriculum on teamwork Attitudes Questionnaire (T-TAQ) survey

Financial Sponsor: N/A

Date: 09-15-19

Time frame for study (please give exact dates desired for data collection): 1-30-19-11, 4:30-5PM

Research Site(s): Avera Sacred Heart

---

Description Of Your Project

Overview: The purpose of this quality improvement project is to determine if there is an improvement in attitudes towards teamwork with the implementation of mock code simulations guided by TeamSTEPPS 2.0 Curriculum. Mean time to defibrillation will also be looked at as a secondary finding throughout this project.

Design: Quality improvement project utilizing a convenience sample.

Sample: Nurses, patient care techs, and hospitalists from the combined medical/surgical unit at Avera Sacred Heart Hospital.

Measures: TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ) will measure nurse’s attitudes toward teamwork. T-TAQ surveys will be matched utilizing a coding system to allow for matching between the first and second simulation sessions. The Wilcoxon signed-rank nonparametric test will be utilized to determine if there is a statistical significance associated with nurse’s attitudes towards teamwork. Only nurses will complete the survey.

Mean time to defibrillation will be measured from the initiation of chest compressions to the first shock delivered. A stopwatch will be utilized to measure the mean time to chest compressions and compared between the two simulations. Descriptive statistics will be utilized for the demographic data.

Intervention: Pre-simulation education guided by TeamSTEPPS 2.0 Curriculum which focuses on teamwork and communication, followed by a high-fidelity mock code simulation, followed by debriefing. This will be conducted again after 6 weeks.

Procedure: Participation in the high-fidelity mock code simulations is mandatory for all staff, while the completion of the T-TAQ survey is optional, and will only be completed by nurses in the sample. Consent will be obtained from nurses willing to participate in the completion of the survey. Nurses, patient care techs, and hospitalists will sign up for one simulation experience, and again in 6 weeks. There will be multiple time slots to choose from for each simulation. They will be educated on TeamSTEPPS 2.0 Curriculum, participate in the mock code simulation which will be led by the hospital's nurse educator, and then participate in a debriefing which will be conducted by the DNP project manager. The T-TAQ will be completed prior to the first session, and after the second session. A demographic survey will be completed by those willing prior to the first simulation.

Significance: This quality improvement project has the potential to improve teamwork and team performance while caring for patients in cardiac arrest, therefore, improving patient outcomes and overall patient care.
**MOCK CODE SIMULATION**

![Image of a form with redacted text](image)

**IRB Information**

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<th>Avera &amp; University IRB's as applicable</th>
<th>Applied for?</th>
<th>Received?</th>
<th>Expires?</th>
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<td>Date</td>
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<td>Yes/No</td>
<td>Date</td>
<td>Date</td>
</tr>
<tr>
<td>2.</td>
<td>Yes/No</td>
<td>Date</td>
<td>Date</td>
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</table>

List of submission documents attached:
- [ ] IRB Research Application
- [ ] Study Protocol dated: 
- [ ] Informed Consent dated: 
- [ ] Consent Form dated: 
- [ ] Clinical Investigator's brochure 
- [ ] Package Insert 
- [ ] FDA Form 1572 dated: 
- [ ] Instructions for use: 
- [ ] Curriculum Vite if first time applicant 
- [ ] Avera IRB Approval Letter dated: 
- [ ] Other (please list)

I will adhere to Avera McKennan Hospital & University Health Center policy and procedures pertaining to confidentiality and this study shall not reveal any patient identifiable information, including but not limited to name, address, or any other information which could identify such patients or the Avera McKennan organization.

Signature of Applicant: [Signature] Date: 10/12/19

Signature of Faculty Advisor/Mentor: [Signature] Approval: Yes/No Date: 10/19/19

Faculty Advisor/Mentor has reviewed and approved this proposal for the Nursing Research Committee.

Signature of Faculty Advisor/Mentor: [Signature] Approval: Yes/No Date: 10/19/19

Signatures:
- Avera Research Institute: [Signature] Approved: Yes/No Date: 10/19/19
- Nursing Research Committee: [Signature] Approved: Yes/No Date: 10/19/19
- Director/Manager (required): [Signature] Approved: Yes/No Date: 10/24/19
- Sr. VP Financial Services (or designee): [Signature] Approved: Yes/No Date: 10/24/19

Form 8691-44 PS (Rev. 7/17) Organizational Research Project Approval Application Not a permanent part of the Medical Record Route to Avera Research Institute
# Statistical Results

## Pre-Intervention T-TAQ Results

| ID     | Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 | Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R9730  | p   | p   | t   | t   | p   | p   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   |
| K9211  | p   | p   | t   | t   | p   | p   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   |
| R1730  | p   | p   | t   | t   | p   | p   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   |
| E9079  | p   | p   | t   | t   | p   | p   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   | t   |

## Post-Intervention T-TAQ Results

| ID     | Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 | Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |
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Average: 4.545454
### Proc UNIVARIATE Results

#### The UNIVARIATE Procedure Variable: `SAVE6186`

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#### The UNIVARIATE Procedure Variable: `MOTHER_665`

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#### The UNIVARIATE Procedure Variable: `COURVE_657`

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#### The UNIVARIATE Procedure Variable: `SMAEL_466`

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Appendix N

Participant Comments

“I am always nervous to do simulations, but I really like them.”

“They are always helpful to practice with the medications.”

“It is nice to practice with the defibrillator and actually be able to shock them.”