

**DNP Scholarly Project Final Approvals**

The DNP student Amanda Huff and the Scholarly Project 'Stanford Emergency Manual Use During Operating Room Crises' meet all the requirements for the degree of Doctor of Nursing Practice at University of Saint Francis-Fort Wayne, IN.

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## **Stanford Emergency Manual Use During Operating Room Crises**

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University of Saint Francis

Submitted for the Fulfillment of the Doctor of Nursing Practice Degree

June 23, 2021

### **Author Note**

*I have read and understand the external assessment assignment policy as outlined in the course syllabus and the Student Handbook. By affixing this statement to the title page of my work, I certify that I have not violated any aspect of the external assessment assignment policy in the process of completing this examination. I further certify that the contents of this examination are the product of my work, and only my work and I have not collaborated with anyone else on this assignment. If it is found that I have violated any of the above-mentioned policy in this assignment, I understand the possible consequences of the act(s), which could lead to dismissal from USF.*

## DNP Scholarly Project Final Approval Form

**University of Saint Francis  
Institutional Review Board  
Human Subjects Review Committee/ACUC/IBC  
Institutional Review Board Approval Form**

**Protocol Number:** 16014153333-HSRC

**Review by (underline one):** HSRC      ACUC      IBC

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**Faculty Advisor:** Dr. Mary Spath

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Other – explain: pre/post test surveys, Sim survey and approval to use, Stanford Manual link

Type of Review:

Full Review

Expedited Review

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Approval:

Approval granted on 10/12/2020

Approval granted on \_\_\_\_\_ for a period of one year.

Conditional approval\* granted on \_\_\_\_\_ for a period of one year.

Not approved\*

IRB approval is not required:

Other

\*Comments: \_\_\_\_\_

The committee performing this review is duly constituted and operates in accordance and compliance with local and federal regulations and guidelines.

\_\_\_\_\_  
Stephanie Oetting  
Printed Name (Chair or designee)

\_\_\_\_\_  
*Stephanie Oetting*  
Signature

\_\_\_\_\_  
10/12/2020  
Date

## Table of Contents

|                       |   |
|-----------------------|---|
| <b>Abstract</b> ..... | 6 |
|-----------------------|---|

### Chapter 1: Introduction

#### **Problem**

|   |   |
|---|---|
| Problem Statement .....                 | 7 |
| Background of the Problem .....         | 7 |
| Practice Gap and Needs Assessment ..... | 9 |

#### **DNP Project Overview**

|                        |    |
|------------------------|----|
| Scope of Project ..... | 10 |
| Stakeholders .....     | 13 |

#### **Budget and Resources**

|                                |    |
|--------------------------------|----|
| Cost .....                     | 13 |
| Description of Resources ..... | 14 |

#### **Process and Outcomes**

|                                    |    |
|------------------------------------|----|
| General Timeline .....             | 14 |
| Setting and Target Population..... | 15 |
| Expected Outcomes .....            | 16 |

#### **Risk Analysis**

|                     |    |
|---------------------|----|
| Risk Analysis ..... | 16 |
|---------------------|----|

### Chapter 2: Synthesis of Supporting Evidence and Project Framework

#### **Relevant Theory and Concepts**

|                                      |    |
|--------------------------------------|----|
| Theoretical Model .....              | 17 |
| Literature Review.....               | 19 |
| Summary of Supportive Evidence ..... | 31 |

### Chapter 3: Project Design

#### **Methodology**

|                              |    |
|------------------------------|----|
| Project Design .....         | 31 |
| Ethical Considerations ..... | 34 |

|   |    |
|---|----|
| Project Schedule and Implementation Methods ..... | 35 |
| Measurement Tool .....                            | 38 |
| Evaluation Plan .....                             | 38 |
| <i>Methods for collection of data.</i> .....      | 39 |
| <i>Data Analysis Plan.</i> .....                  | 39 |
| Dissemination Plan .....                          | 41 |
| Implementation Process Analysis .....             | 41 |

#### **Chapter 4: Results and Outcomes Analysis**

|                                  |    |
|----------------------------------|----|
| Data Collection Techniques ..... | 42 |
| Measures/Indicators .....        | 43 |
| Data Analysis Inferences .....   | 47 |
| Gaps .....                       | 49 |
| Unanticipated Consequences ..... | 49 |
| Expenditures .....               | 50 |

#### **Chapter 5: Leadership and Management**

|                                       |    |
|---------------------------------------|----|
| Change Strategy .....                 | 58 |
| Leadership Style .....                | 59 |
| Interprofessional Collaboration ..... | 60 |
| Conflict Management .....             | 61 |

#### **Chapter 6: Discussion**

|  |    |
|--|----|
| Impact of Project.....                         | 63 |
| Decisions and Recommendations .....            | 64 |
| Limitations of the Project .....               | 65 |
| Applications to Other Settings.....            | 66 |
| Strategies for Maintaining and Sustaining..... | 66 |
| Lessons Learned .....                          | 67 |

#### **Chapter 7: Conclusion**

|   |    |
|---|----|
| Potential Project Impact on Health Outcomes Beyond Implementation Site..... | 69 |
| Health Policy Implications of Project.....                                  | 69 |
| Proposed Future Direction for Practice .....                                | 70 |

|   |     |
|---|-----|
| <b>References</b> .....                                 | 72  |
| <b>Appendices</b> .....                                 | 83  |
| Appendix A: Simulation Completion Certificate .....     | 83  |
| Appendix B: Informed Consent .....                      | 84  |
| Appendix C: SET-M Tool .....                            | 87  |
| Appendix D: Demographic Questionnaire .....             | 88  |
| Appendix E: Pre-test .....                              | 89  |
| Appendix F: Post-Test .....                             | 91  |
| Appendix G: SWOT Analysis .....                         | 94  |
| Appendix H: Gantt Chart.....                            | 95  |
| Appendix I: Parkview Noble Hospital Support Letter..... | 96  |
| Appendix J: CITI Training Certificates .....            | 97  |
| Appendix K: Learning Objectives .....                   | 99  |
| Appendix L: SET-M Permission Letter.....                | 100 |
| Appendix M: Data Analysis Plan .....                    | 101 |
| Appendix N: DNP Project Initial Approval Form.....      | 115 |
| Appendix O: Attestation Letter to IRB.....              | 116 |
| <b>Figures</b> .....                                    | 117 |

## Abstract

**Purpose:** The purpose of this Doctor of Nursing Practice (DNP) project was to implement the Stanford Emergency Manual as a quality improvement (QI) process for crisis management in the perioperative setting at Parkview Noble Hospital. **Aims:** The three aims and focus of the QI project were to increase participants' action of accessing the Stanford Emergency Manual for crisis management when unsure of a critical step, increase participants' confidence in managing a simulated crisis, and examine whether debriefing was a valuable component of the QI project. **Results:** Results displayed that there was a 51.67% increase in percentage points on the post-knowledge test when the Emergency Manual was utilized. Also, the post-Simulation Effectiveness Tool-Modified (SET-M) "scenario" scores showed that participants agreed that personal confidence was increased after a malignant hyperthermia (MH) simulation experience utilizing the Stanford Emergency Manual. The third result displayed that 77.77% of total "debriefing" scores on the post SET-M tool stated *strongly agree* in that debriefing was beneficial to the QI project process. **Recommendations:** The recommendation based on this DNP QI project is to utilize the Stanford Emergency Manual in the perioperative setting. The Manual was a patient safety adjunct and increased crisis management knowledge and confidence of the perioperative staff at Parkview Noble Hospital.

## Chapter 1: Introduction

### Problem

#### *Problem Statement*

When a crisis arises in the operating room (OR) setting, knowledge, efficient teamwork, communication, and situational awareness are needed to prevent unnecessary patient harm (Calder et al., 2017). Although healthcare personnel may have previously learned OR crisis management, stress causes people to forget critical steps (Kuhlmann et al., 2005). If efficient teamwork, communication, and situational awareness are lacking, undue harm may result. A crisis manual, also known as an emergency manual, checklist, or cognitive aid has been shown to decrease errors made and improve patient outcomes (Calder et al., 2017; Everett et al., 2017). The literature exemplifies that utilizing a cognitive aid during an OR crisis is an integral part of patient safety and a method of improving crisis management.

Many hospitals have implemented this process; however, Parkview Noble Hospital- a small rural hospital in northeastern Indiana- did not have a standardized process in place to help OR staff handle a crisis in a coordinated, systematic way. Therefore, a specific cognitive aid, known as the Stanford Emergency Manual, was a valuable tool to implement (Alidina et al., 2018; Goldhaber-Fiebert & Howard, 2013). When a patient's condition deteriorates, the Stanford Emergency Manual can be quickly accessed and can aid staff in evidenced based crisis management.

#### *Background of the Problem*

Throughout the last century, research has influenced the use of cognitive aids in various industries including, but not limited to, aerospace, the military, and aviation (Evain et al., 2019; Hey & Turner, 2016). In the 1930s, cognitive aids were developed and were made a passenger

safety standard for all aircraft carriers (Meilinger, 2008). The importance of checklist use was exemplified in the 1970s when two, Boeing 747 airplanes collided on a runway. After this event, Crew Resource Management aids (CRM) were created to have improved team communication, reduced errors, and a culture of safety (Sax et al., 2009). From 1990-1994, aviation greatly decreased fatality rates and during the year of 1998, the United States commercial aviation pilots had a zero percent mortality rate as a result of emergency preparedness (Kohn et al., 2000). Aviation became vigilant in putting safety standards in place in order to increase passengers' safety and decrease errors related to operator exhaustion, stress, and poor communication. This industry recognized the importance of a checklist manual as a memory aid (Sax et al., 2009). The aviation industry has created a safety path for other industries to follow.

Select healthcare industries and facilities have adopted a cognitive aid as a patient safety initiative (Shear et al., 2019). Regarding anesthesia related healthcare practice, in 1993 the United States Food and Drug Administration (FDA) created an anesthesia checkout list to be completed prior to each case of the day (Harrison et al., 2006). The Veterans Affairs (VA) National Center for Patient Safety created and placed cognitive aids in each VA OR. After six months, records showed that seven percent of anesthesiologists used the tool during a crisis (Neily et al., 2007). The World Health Organization's Surgical Safety Checklist (SSC) implementation was also associated with decreased mortality rates and length of hospital stay (Simmons & Huang, 2019).

Stanford incorporated the Stanford Emergency Manual into the OR setting, resulting in successful use of the Manual during a crisis (Goldhaber-Fiebert et al., 2016). Fifteen months after the Emergency Manuals were incorporated into the OR at Stanford, 45% of participants used the Emergency Manual during a critical event and 78.9% stated that the Manual helped

provide optimal patient care (Goldhaber-Fiebert et al., 2016). An exemplar of the Emergency Manual use was at Massachusetts General Hospital (MGH) in 2014. Bereknyei Merrell and colleagues (2018) discussed the use of the Emergency Manual during a pulseless electrical activity (PEA) crisis. The Manual use fostered a coordinated, evidenced-based practice, team-centered approach to crisis management. The patient survived and was safely discharged home (Bereknyei Merrell et al., 2018). The Emergency Manual usage has the potential to decrease mortality in healthcare.

Furthermore, research showed that cognitive aids or emergency manual use was greater amongst those who had participated in simulation training with the same aid or manual to be used in a crisis and that teams developed improved communication skills and team dynamics during training (Huang, et al., 2018). In essence, more hospitals have recognized the impact on patient safety that the aviation industry recognized many years ago.

### ***Practice Gap and Needs Assessment***

Worldwide, many hospitals have implemented emergency manuals, or cognitive aids, into the OR setting. However, Parkview Noble Hospital did not have a standard process in place to help OR staff handle a crisis in a coordinated, systematic approach. During a conversation with a certified registered nurse anesthetist (CRNA) at the facility, the project manager inquired about steps the facility had in place if local anesthetic systemic toxicity (LAST) occurred. Neither the CRNA nor an OR nurse knew what LAST stood for. Furthermore, during a discussion with a CRNA regarding an emergent cesarean section, the CRNA replied that the OR staff lacked the knowledge of emergency management and prioritization. With the anecdotal data collected and a thorough review of the literature, it was apparent that Parkview Noble Hospital had a gap in practice.

Both the director of the OR and the director of anesthesia at Parkview Noble Hospital were eager to have the Stanford Emergency Manual implemented. The anesthesia director voiced that he was familiar with cognitive aids; however, he had not had the chance to implement the Emergency Manual at Parkview Noble Hospital. The OR director relayed that crises were not a frequent occurrence at the facility and that the Manual would be pivotal for staff to access during crisis management.

## **DNP Project Overview**

### ***Scope of Project***

This DNP Scholarly Project was a quality improvement (QI) project guided by evidence-based practice. The Stanford Emergency Manual QI project was designed to improve patient outcomes, initiate a practice improvement, and decrease the practice gap in crisis management at Parkview Noble Hospital. The goals of the QI project were to increase participants' knowledge of proper use of the Stanford Emergency Manual (e.g. use the manual to look up a critical step in crisis management versus relying on memory alone) and to improve participants' confidence regarding skills in crisis management. In order to meet these goals, an educational PowerPoint presentation on the importance of crisis management with the Stanford Emergency Manual was provided along with a malignant hyperthermia (MH) simulation where participants utilized the Emergency Manual to effectively manage the MH crisis. The desire of the simulation was to increase participants' confidence when faced with a crisis.

The project manager communicated with Professor Dawn Parker, MSN, RN, CNE, CHSE, School of Health Sciences simulation lab director at the University of Saint Francis (USF). Professor Parker gave the project manager guidance for running a MH simulation and contact information for an expert simulation assistant from the Mirro Center (the Mirro Center is

part of the Parkview Health network and a center which focuses on research and innovation in healthcare). The project manager communicated with Parkview Network's simulation supervisor and a nurse educator who desired to assist with the simulation on implementation day.

Unfortunately, due to coronavirus disease 2019 (COVID-19) and social distancing restrictions, the simulation supervisor communicated that simulations completed with the help of Parkview Network were on hold until future notice. Therefore, in order to complete the QI project according to schedule, the project manager organized and prepared the MH simulation.

Simulation preparation included the completion of the course Simulation 101 (SIM 101) in order to have a better understanding of conducting a simulation experience. Professor Dawn Parker, MSN, RN, CNE, CHSE, School of Health Sciences simulation lab director at USF, recommended that the project manager complete the simulation education online modules provided by the University of Washington. Furthermore, the project manager abided by the International Nursing Association for Clinical Simulation and Learning (INACSL) standards for simulation, completed the modules, and attached the SIM 101 completion certificate in appendix A.

The DNP QI project began with a proper introduction of the project manager and the title of the DNP project. Participants were then given an overview of the QI project schedule. Next, they were given a randomly assigned numbered folder and were instructed to read and sign the informed consent (appendix B). Next, participants filled out a portion of the Simulation Effectiveness Tool-Modified (SET-M) survey (appendix C), demographic survey (appendix D), and a pre-test (appendix E). Confidentiality was maintained at all times as identifying information was not placed on any survey documents. Participants were instructed to keep their

forms in their folder. Participants did not share their folder number in order to maintain confidentiality.

The purpose of the pre-test was to compare the participants' response to select crisis scenarios when they relied on memory alone to the post-test (appendix F) where the Manual could have been accessed. Participants were not expected to know these knowledge questions on the pre-test as the goal was not to provide questions that participants knew, but rather to construct questions on crisis algorithms outlined in the Emergency Manual. The knowledge tests taught participants to use the Manual to look up a crisis management step versus relying on their memory. In essence, this QI project helped staff gain the knowledge to know where to look for the answer when faced with a crisis.

Next, a PowerPoint was presented by the project manager on the importance of utilizing the Stanford Emergency Manual and crisis management. Following the PowerPoint, simulation pre-briefing occurred. Participants met in the designated location for a simulated MH crisis guided by the project manager. The goal of the simulation was to have participants accurately and efficiently tend to the crisis with the aid of the Stanford Emergency Manual. After the simulation had finished, a debriefing session occurred in a meeting room which enabled participants to voice their opinions and discuss whether they felt their confidence had increased as a result of the QI project. After the debriefing, participants completed the post-test and the post-SET-M survey.

The Emergency Manual QI project did not include detailed teaching on every individual crisis management scenario that is present in the Emergency Manual as the goal was not to teach individual crisis management but rather to educate participants to use the Emergency Manual during a crisis. Participants gained the knowledge to know where to look when in the midst of a

crisis versus relying on memory along with utilizing the same cognitive aid-such as the Stanford Emergency Manual-during simulation as the one used in a crisis. If the cognitive aid is unfamiliar to staff, it is unlikely to be helpful in a dire situation.

### ***Stakeholders***

Parkview Health's mission statement was to "Provide quality health services to all who entrust their care to us" (Parkview Health, 2020). Knowing that Parkview Health supported quality and patient safety, they were a key stakeholder for the QI project. Specific stakeholders of Parkview Noble Hospital were the OR director, director of anesthesia, the OR and perioperative staff, and future patients.

The University of Saint Francis was another key stakeholder in the success of the QI project. Dr. Mary L. Spath, PhD, RN, CNE, associate professor of nursing at USF served as the DNP project advisor and was a great resource throughout the QI project process. Dr. Gregory Louck, NAP program director at USF, DNP, CRNA served as the academic advisor and project team member for the project manager. Professor Dawn Parker, MSN, RN, CNE, CHSE, USF simulation lab director at USF assisted with the simulation planning. The stakeholders helped this project come to fruition and the Emergency Manual to become a part of the OR setting at Parkview Noble Hospital.

### **Budget and Resources**

#### ***Cost***

The Stanford Emergency Manual was a free download from the Stanford website: [http://web.stanford.edu/dept/anesthesia/em/semv3.1\\_digital.pdf?\\_ga=2.219553945.1406350378.1501440567-576169366.1501440567](http://web.stanford.edu/dept/anesthesia/em/semv3.1_digital.pdf?_ga=2.219553945.1406350378.1501440567-576169366.1501440567) . However, there were financial obligations in printing and preparing the manuals. Other costs included printing the documents needed for the project and data analysis. The cost for the QI project was approximately \$300 and was funded by the project

manager. COVID-19 impacted the items needed for the simulation. Due to Parkview Health's sanitary restrictions, the project manager furnished the supplies for the simulation. The project manager was able to borrow a low-fidelity mannequin from USF and borrow supplies for the MH simulation from the Nursing Anesthesia Department at USF.

### ***Description of Resources***

The resources utilized for the QI project included resources provided by the project manager, USF, and Parkview Noble Hospital. The project manager provided three color printed and laminated Emergency Manuals on a book ring, one color printed and laminated Emergency Manual in a binder, folders and survey forms, and a computer to display the presentation to participants. The University of Saint Francis and the Nursing Anesthesia Program at USF provided a low-fidelity mannequin and MH simulation supplies (e.g. mock Dantrolene vials, syringes, saline, sterile water, and containers for mixing Dantrolene). Parkview Noble Hospital provided participants, a meeting room, chairs, and an endoscopy room equipped with a ventilator and a patient hospital bed for the simulation. After the QI project implementation was completed on January 12, 2021, the staff appreciated the Emergency Manuals greatly and requested three additional Manuals. Thus, a total of seven Stanford Emergency Manuals were provided for Parkview Noble Hospital.

### **Process and Outcomes**

#### ***General Timeline***

January of 2020 marked the beginning of the DNP project. A comprehensive literature search occurred in order to have a better understanding of the gap in practice. Throughout the year of 2020 multiple steps in the QI project took place. During January through March 2020, meetings, phone calls, and emails were completed in order to plan for the simulation and implementation of the project. The project manuscript was divided into separate parts for

submission as part of NURS 638. During NURS 658, a strengths, weaknesses, opportunities, and threat (SWOT) analysis (appendix G), budget planning, and a Gantt chart was drafted (appendix H). In the following course, NURS 710, the methods for the project were drafted and included formulating project aims and outcomes, selecting measurement tools, establishing a data collection and analysis plan for outcome evaluation, and constructing a preliminary dataset. In NURS 715, USF's Institutional Review Board (IRB) preparation and submission were completed. The DNP project was implemented on January 12, 2021. One day was set aside for the project implementation and data collection. The project manager returned three weeks later to provide the three additional Emergency Manuals requested and followed up with the perioperative staff and OR educator to assess Emergency Manual utilization. Dissemination of the QI project process and results to USF faculty and colleagues occurred on June 17, 2021. Publishing the QI project- if occurred-was after dissemination.

### ***Setting and Target Population***

The target setting was Parkview Noble Hospital in Kendallville, Indiana. The goal was to use a meeting room to present the PowerPoint and then to use an OR for a realistic simulation experience for the participants. Due to COVID-19 precautions, limited time was allotted for the project manager to be at the facility and use an OR. Therefore, the OR director communicated, via email, with the project manager that the meeting room provided was in the endoscopy unit along with the endoscopy specific room for the simulation. Both prebriefing and debriefing occurred in a quiet environment where participants could concentrate and complete surveys as directed.

A sample size of at least ten participants was desired. However, much to the project manager's surprise, the sample consisted of 12 participants. Inclusion criteria included any

perioperative staff and current medical professional students completing training in the perioperative unit at Parkview Noble Hospital. Many of the OR nurses also work in the preoperative and post anesthesia care unit (PACU) setting, thus perioperative staff was included. Participation was strictly voluntary, and each member received and signed informed consent detailing the purpose, process, risks, benefits, lack of compensation, and contact information. Exclusion criteria included anyone not part of the perioperative staff at Parkview Noble Hospital nor involved with clinical care in the perioperative unit.

### ***Expected Outcomes***

The first expected outcome of the QI project was that participants would increase their use of the Emergency Manual as evidenced by intended use of the Manual on the post-test and simulation. The second expected outcome was that participants would increase their confidence in crisis management as evidenced by the SET-M scores. Ultimately, the goal for Parkview Noble Hospital was to sustain the use of the Emergency Manual and keep a Manual in each OR.

### **Risk Analysis**

#### ***Risk Analysis***

During April 2020, informed consent was drafted (appendix B). The official IRB approval from USF was obtained in the Fall of 2020 along with the letter of support from Heather Antal, OR director at Parkview Noble Hospital (appendix I). During the project, there was not a risk of patient harm because this project was a simulated experience, using a mannequin, and did not involve care on human subjects. During the simulation, the risks to the staff were the same as a normal day in the OR (e.g. a needle stick during medication preparation). If a needle stick injury had occurred, as stated in the informed consent, participants were directed to follow Parkview Health's protocol regarding needle stick injury. Staff were also aware that compensation would not be provided. Participants were guided through a debriefing

session after the simulation, which had the potential to make a person feel vulnerable as he or she shared his or her thoughts of the experience.

The informed consent detailed the safeguards that were incorporated. Confidentiality was upheld as identification information was not placed on the demographic data form or surveys. The anonymous data collected was stored in a locked filing cabinet and was only accessed by the project manager. After project dissemination, the results were emailed to the OR director. Any data that would be published would be the totality of the project and identifying information would not be used. The paperwork and data gathered through this QI project would be appropriately discarded six months after the project completion.

A SWOT analysis was completed in the summer of 2020 (appendix G). The project manager prepared for barriers and threats that could have been present on implementation day. If all the participants remained compliant to the cultural change, then the continued use of the Manual would help prevent undue harm to patients (Bereknyei Merrell et al., 2018). The goal was that participants would see this Emergency Manual as a necessity to crisis management and not a burden or insult to their knowledge.

## **Chapter 2: Synthesis of Supporting Evidence and Project Framework**

### **Relevant Theory and Concepts**

#### ***Theoretical Model***

The theoretical model chosen to guide this QI project was the Knowledge-to-Action (KTA) model. Discouraged that few research findings were implemented into healthcare practice, Dr. Ian Graham and colleagues at the University of Ottawa drafted the KTA model. (Graham et al., 2006). This model discussed the relationship between acquiring new knowledge and subsequently applying that knowledge (Straus et al., 2013). According to White (2016), planned action models are created to guide a change process. Frequent communication

throughout the process is encouraged in order for change to be successful (Straus et al., 2013; White, 2016). The KTA model helped the project manager organize the beginning stages of the QI project.

The KTA model consisted of two sections: knowledge creation and knowledge action (White, 2016). Knowledge creation included three subcategories: knowledge inquiry, knowledge synthesis, and knowledge tools and products. These sections helped refine knowledge until it was applied into healthcare practice (Straus et al., 2013).

For the QI project, knowledge creation was addressed by the following:

1. **Knowledge inquiry:** In the early planning stages of the QI project, the project manager explored current crisis management strategies with OR staff at Parkview Noble Hospital.
2. **Knowledge synthesis:** With the help of the PowerPoint presentation, knowledge of the Manual's importance was relayed to the participants.
3. **Knowledge tools and products:** The Manual was placed in each OR at Parkview Noble Hospital.

The action cycle followed knowledge creation (Straus et al., 2013). This cycle included six subsets (Straus et al., 2013; White, 2016). Each topic was addressed in the following ways:

1. **Identify problem:** The problem identified was that Parkview Noble Hospital did not have an Emergency Manual to use during an OR crisis.
2. **Adopt knowledge to local context:** The Emergency Manual was a cognitive aid that was specific to the perioperative setting at a facility such as Parkview Noble Hospital.
3. **Assess barriers to knowledge use:** Barriers to the use of the Manual were addressed. Possible barriers included disinclination to use the Manual, accessibility, and cost.

4. **Select, tailor, implement interventions:** The Manual was introduced through a PowerPoint. A simulated malignant hyperthermia (MH) crisis was conducted in which participants used the Manual to guide the management of the crisis.
5. **Monitor knowledge use:** Knowledge was measured during a simulated crisis. Participants were encouraged to practice periodic simulations to increase their familiarity with the Manual.
6. **Evaluate outcomes:** Outcomes were evaluated by the project manager after the QI project was implemented and for several weeks following QI project implementation.
7. **Sustain knowledge use:** The Manual was given to the facility by the project manager. The project manager emphasized the importance of frequent use and simulation training with the Manual to retain crisis knowledge (Goldhaber-Fiebert & Howard, 2013). The sustainment of the Manual was the responsibility of Parkview Noble Hospital.

The knowledge creation and action cycle are an ongoing process that require frequent re-evaluation. Participants must feel that the knowledge is worth sustaining and that the outcomes are better with the knowledge presented to them. The project manager desired for the KTA model to guide the implementation of the Stanford Manual at Parkview Noble Hospital.

### ***Literature Review***

**Introduction.** Cognitive aids have been utilized since the early 1900s and have been gradually incorporated into medical settings (Banguti et al., 2018). Cognitive aids are devices to help prevent patient harm and increase personnel's confidence when faced with a crisis. The purpose of this comprehensive literature review was to inform the reader of the importance of cognitive aid use as an adjunct to patient safety during a crisis. In this DNP project, the reader learned of the following topics in relation to the use of cognitive aids: the history, landmark

studies, literature search process, framework, implementation methods, and barriers to implementation. Therefore, what are the strategies for initiating the use of a cognitive aid, such as the Stanford Emergency Manual, in simulated operating room crises in order to increase both OR staff's knowledge of critical steps and their confidence in an OR crisis?

**History of Cognitive Aids.** Throughout the last century, research showed that there has been increased use of cognitive aids in various industries including aerospace, military, and aviation (Evain et al., 2019; Hey & Turner, 2016). In the 1930s, cognitive aids were developed and became a passenger safety standard for all aircraft carriers (Meilinger, 2008). From 1990-1994, the aviation industry greatly decreased fatality rates. In 1998, the United States commercial aviation pilots had a zero percent mortality rate (Kohn et al., 2000). Aviation was vigilant in putting standards in place to increase passengers' safety including areas such as operator exhaustion, stress, and poor communication. Aviation has recognized the importance of a cognitive aid versus relying on memory alone (Degani & Wiener, 1990). A specific cognitive aid, the Crew Resource Management (CRM) aid, was created in the 1970s, after two Boeing 747 aircraft carriers collided on a runway. The CRM aid improved team communication, reduced errors, and created a culture of safety (Sax et al., 2009). According to Sax et al. (2009) commercial aviation is the safest way to travel.

The healthcare industry has gradually begun to adopt cognitive aids as a method to increase patient safety (Shear et al., 2019). Regarding anesthesia related healthcare practice, in 1993 the United States Food and Drug Administration created an anesthesia checkout list to be completed prior to the first case of the day (Harrison et al., 2006). This checkout list assured that the anesthesia machine was functioning properly. The Veterans Affairs (VA) National Center for Patient Safety created and placed cognitive aids in each VA OR. After six months, records

showed that seven percent of anesthetists used the tool during a crisis (Neily et al., 2007). The literature showed that more healthcare facilities followed aviation's example of cognitive aid use in an effort to improve patients' safety.

**Definition of a Cognitive Aid.** A cognitive aid was an inexpensive means to improve patient safety, communication, and teamwork (American College of Obstetricians and Gynecologists [ACOG], 2016; Bliss et al., 2012). These aids also assured that all steps of a task were completed and that teamwork and communication was optimized (ACOG, 2016). A cognitive aid could be in the form of an emergency manual, listing individual crises that may occur (Bereknyei Merrell et al., 2018). Throughout the literature, the term "cognitive aid" was used interchangeably with the terms "emergency manual," "checklist," and "implementation tool." Therefore, throughout this literature review, those terms were used interchangeably to refer to a cognitive aid.

Cognitive aids are a guide and helped provide timely patient care. These aids state essential steps, that if neglected, may result in patient morbidity and mortality (ACOG, 2016). A cognitive aid does not explain a process before it occurs. Rather, it is a tool to aid in the completion of critical steps during a crisis (Chrimes, 2016). The objective of a cognitive aid is to assist qualified staff members in recalling previously learned information and prevailing in a crisis.

**Literature Search Process.** In an extensive review of the databases and literature associated with cognitive aids, 102 articles were singled out and used to synthesize the review. A total of 16 databases were searched with multiple different keywords relating to the subject. Inclusion criteria consisted of the following: written in English, peer-reviewed, dealt with the adult population, and mentioned the OR setting. The literature review began with completing a

spreadsheet with the following different database categories: filtered evidence resources, guideline resources, unfiltered or raw article databases, and other resources. The first category, filtered evidence, was a grouping of articles that were secondary sources, summaries of primary sources, or explanations for practice recommendations (Southern Cross University, 2020). The category yielded the following results in Table 1.1 that were helpful to the literature review.

**Table 1.1.**

| Keywords   | Database   | Number of Results for Key Words |
|--|--|---------------------------------|
| Checklists in operating room crisis  | Campbell Collaboration Library of Systematic Reviews | 2498                            |
| Cognitive aids in operating room   | Campbell Collaboration Library of Systematic Reviews | 3609                            |
| Operating room cognitive aid   | Cochrane Database of Systematic Reviews              | 9                               |
| Operating room staff, cognitive aid, memory, improved operating room crisis management | TRIP Database  | 82                              |
| Emergency checklists   | TRIP Database  | 2997                            |
| Emergency checklists in the operating room   | TRIP Database  | 498                             |
| Cognitive aids in the operating room   | TRIP Database  | 282                             |

Next, guideline resources were searched. The National Guideline Clearinghouse was the single source that gave literature pertinent to this review. The keywords, “cognitive aids in the operating room” and “emergency manual and intraoperatively” populated 504 and >10,000 results respectively which were then further refined based on applicability. The knowledge base for the professional organization, American Association of Nurse Anesthetist (AANA), was

explored with the keyword “cognitive aid” and yielded 99 results which were searched further for applicability. Lastly, unfiltered article databases were searched and yielded the results in

Table 1.2.

**Table 1.2**

| Key words  | Database(s)  | Number of Results for Key Words |
|--|--|---------------------------------|
| Cognitive aid AND operating room   | CINAHL Plus and ProQuest Nursing and Allied Health | 4, 2365                         |
| Emergency manual AND operating room  | CINAHL Plus  | 5                               |
| Crisis management  | EBSCO Open Dissertations                           | 334                             |
| Checklists AND crisis management   | EBSCO Biomedical Reference Collection              | 137                             |
| Checklists AND crisis management AND hospital  | EBSCO Biomedical Reference Collection              | 63                              |
| Emergency manual AND emergency/and patient safety/and checklist/and perioperative period | Emcare (Ovid)                                      | 1                               |
| Emergency manual and intraoperative  | Emcare (Ovid)                                      | 2                               |
| Manual of emergency airway management and intraoperative                                 | ProQuest Nursing and Allied Health                 | 601                             |
| Cognitive aid and crisis management  | PsycInfo   | 3                               |
| Checklists in medicine   | PubMed   | 23510                           |
| Cognitive aid in the operating room  | PubMed   | 21                              |
| Cognitive aids in medicine   | Directory of Open Access Journals                  | 317                             |

In addition to searching through databases, this author consulted with a librarian to find clinical practice guidelines, to define key terms, and to locate primary sources. After the initial literature search this author recognized articles that frequently mentioned “simulation” and

“barriers” and then searched the databases for more articles on those select topics for the literature review. After gathering the key articles and abstracts, an outline was constructed to guide thoughts in an organized manner.

**Landmark Organizations and Studies.** The Institute of Medicine (IOM) recorded that three to four percent of hospital injuries were preventable (Kohn et al., 2000). Human error in the healthcare setting was likened to a Boeing 747, full of passengers, crashing daily for a year (Spiess, 2013). Hence, a commitment to patient safety became the primary concern in this fast-paced perioperative (preoperative, intraoperative, and postoperative phases) culture. Multiple different organizations such as the World Health Organization (WHO), the Emergency Manual Implementation Collaborative, and The American College of Surgeons have highlighted the importance of an emergency checklist to guide patient care. The American College of Surgeons National Surgical Quality Improvement Program discovered that when a checklist was used, a statistically significant ( $p=0.000$ ) reduction in errors occurred (Bliss et al., 2012). In 2008, the WHO created an International Surgical Safety Checklist (SSC) to decrease untoward surgical events. This checklist has been implemented worldwide (Evain et al., 2019). For example, when the SSC was implemented in Scotland, mortality rates dropped by 36.6 % (Ramsay et al., 2019). The Emergency Manual Implementation Collaborative, a professional organization sponsored by the Council on Surgical and Perioperative Safety, was created exclusively for research and implementation of emergency manuals (Simmons & Huang, 2019). These organizations recognized the importance of cognitive aid creation and utilization.

For twenty years, Stanford has educated healthcare professionals on crisis management (Goldhaber-Fiebert & Howard, 2013). The Stanford Anesthesia Cognitive Aid Group studied that people, including healthcare professionals, cannot easily recall rarely utilized information

(Goldhaber-Fiebert & Howard, 2013). To avoid the potentially offending words of “cognitive aid,” which implied that providers do not have adequate knowledge, Stanford compiled a group of cognitive aids into a manual known as the Stanford Emergency Manual (Goldhaber-Fiebert & Howard, 2013). Stanford designed and tested it through simulated crises prior to placing it into each Stanford OR. Since 2012, the Manual has been placed into different perioperative locations at Stanford. Fifteen months after the implementation of the cognitive aids, 45% (19 professionals) said that they used the Manual at least one time during a crisis, with 11% of users accessing the Manual more than three times (Goldhaber-Fiebert et al., 2016). Of the Manual users, 78% said that it helped provide better patient care (Goldhaber-Fiebert et al., 2016). Worldwide, the Stanford Emergency Manual has been downloaded more than 20,000 times (Goldhaber-Fiebert et al., 2016). The Stanford Anesthesia Cognitive Aid Group has recognized that during a crisis, errors occurred related to leadership, communication, lack of knowledge, and stress (Goldhaber-Fiebert & Howard, 2013). The research exemplifies the importance of Emergency Manual use.

In a study performed in China, the Stanford Emergency Manual was provided to hospitals (Huang et al., 2019). The study showed that among the people receiving the Manual, there were more crisis review, group study, simulation training, and cognitive aid utilization during a crisis than among those who did not receive the Manual ( $p < 0.001$ ) (Huang et al., 2019). As China discovered, the Manual improved staff knowledge and efficiency in a crisis, which resulted in decreased patient morbidity and mortality (Simmons & Huang, 2019). These studies showed that the Emergency Manual can significantly decrease patient errors.

Several milestone studies were documented in the literature. Bliss et al. (2012) mentioned a study that showed use of a surgical safety checklist and a team training course that resulted in a

statistically significant decrease in 30-day morbidity and mortality. In a “can’t intubate, can’t ventilate” scenario, anesthesiologists’ skills were improved when a cognitive aid was used. In this scenario, an emergent airway was placed in three minutes in 76% of the study group compared to the control participants (55.3%) who did not use a cognitive aid ( $p < 0.001$ ) (Marshall & Mehra, 2014). Local anesthetic systemic toxicity (LAST) was another area in which a cognitive aid was helpful. When the staff used a checklist, 16 tasks were performed correctly versus eight tasks when a checklist was not used (Neal et al., 2012). The French Society of Anesthesia and Intensive Care had a malignant hyperthermia (MH) checklist that was used for a simulated MH crisis (Hardy et al., 2018). MH is a deadly disease of skeletal muscle catabolism that manifests after the induction of anesthesia. If not treated quickly, MH will result in patient death. When the staff were placed into two groups, checklist and control, there was better performance and faster administration of the life-saving medication, Dantrolene, in the checklist group. Dantrolene was administered seven minutes faster than the control group (Hardy et al., 2018). All of these studies demonstrated that team communication and lifesaving skills were improved with cognitive aids.

Massachusetts General Hospital (MGH) averages 42,000 surgeries a year. Six clinicians were involved in a real life pulseless electrical activity (PEA) crisis. Previously, a Stanford study was conducted at MGH and an Emergency Manual was placed in each OR (Bereknyei Merrell et al., 2018). During the PEA crisis, a clinician initiated the use of the Manual which helped result in patient survival. The staff members involved in this crisis stated that the Emergency Manual helped to increase teamwork, helped to decrease anxiety, and led to a positive patient outcome. Of note, all the staff involved had over 20 years of experience in their fields (Bereknyei Merrell et al., 2018). It was vital for clinicians to remember that regardless of the years of work experience, a crisis can occur at any time and all staff must be prepared to act.

**Necessity of a Cognitive Aid.** After reading the history, definition, and published landmark organizations and studies, it was apparent that cognitive aids were an important component to patient safety. The Emergency Manual was an ideal tool for decreasing the number of forgotten critical steps and improving team communication during an OR crisis. From a medical standpoint, stress negatively affects performance. Cortisol, a hormone released in the body during a stressful encounter, hinders one's memory during a crisis and causes critical actions to be forgotten (Kuhlmann et al., 2005). Therefore, when staff encounters a rare patient crisis in the OR, there is both a memory and knowledge deficit that can result in patient mortality (Kuhlmann et al., 2005). Furthermore, multiple studies indicated that regardless of the years of professional experience, people were unable to thoroughly remember information, especially rarely used information (Goldhaber-Fiebert et al., 2015; Marshall, 2017). Because crises were a rare occurrence, a cognitive aid was an important memory aid.

Lack of quality communication was a common issue among OR staff (Agarwala et al., 2019). While a cognitive aid helped with decision making in a crisis, it was to be used in addition to clinician judgement and not as a replacement (Bereknyei Merrell et al., 2018). Communication among team members was able to improve with the help of a cognitive aid. Crises challenged the most experienced OR team. These devices helped staff prevail in a crisis, recall information that may otherwise be forgotten, identify errors, and learn from past mistakes (Goldhaber-Fiebert et al., 2015; Hey & Turner, 2016). Knowing that memory retrieval and team communication can be improved with a cognitive aid, facilities would benefit from implementing this process.

**Leadership and Organization Support.** Several strategies must be present in order to properly implement a cognitive aid. The first strategy was to gain support from leadership and

the organization. Quality leadership support was essential to guide the introduction and the sustainability of the cognitive aid at a facility (Alidina et al., 2018). Passive leaders are unsuccessful in overcoming the cultural change (Spiess, 2013). If a cognitive aid is supported by all stakeholders of a facility and is implemented in an organized manner, there is potential for it to be used in a crisis (ACOG, 2016; Alidina et al., 2018). Moreover, it is important for leadership to encourage staff education on the cognitive aid.

**Simulation Training.** The second strategy for improved cognitive aid implementation was simulation training. The literature stated that simulation was an essential method to increase the use and familiarity of cognitive aids (Goldhaber-Fiebert et al., 2015; Huang et al., 2018). Dagey (2017) mentioned that simulation identified a gap in knowledge. For instance, some staff did not know how to connect the defibrillator pads to a defibrillator. Multiple studies also stated that simulation training was best to increase knowledge of crisis management (Vural Dođru & Zengin Aydın, 2020). Furthermore, when a checklist was combined with simulation training, there was more than a 50% decrease in time needed to complete a lifesaving task (Spiess, 2013). Simulation not only increased correct decision making, task management, teamwork, situational awareness, but also decreased errors (Boet et al., 2014; Hall et al., 2020; Huang et al., 2019). A randomized controlled trial (RCT) in Australia consisted of 21 groups of providers that worked in the emergency room. The groups completed 84 simulated crises. There was a 54% reduction in errors when a cognitive aid was used, and 97% of participants desired for one to be made readily available (Hall et al., 2020).

Because cognitive aids have become more commonly used in the healthcare setting, someone might question why some facilities use cognitive aids while others do not. These questions were facility specific as some cognitive aids were met with resistance by staff

members. It was not enough to simply place a cognitive aid in an OR and expect all personnel to use it in a crisis. Rather, leadership support, discussions focused on the aid's importance, and simulation training helped cognitive aids to become successfully utilized (Huang et al., 2019). It is vital that an organization understand the importance of a cognitive aid and its impact on patient safety.

**Established Reader.** A third implementation strategy was utilizing a reader. A reader was a staff member that read the cognitive aid, tracked time, and checked off items that have been completed (ACOG, 2016). In the literature, before a reader was implemented, participants missed critical steps. After a reader was designated, no critical steps were missed (Burden et al., 2012). Arriaga et al. (2013) stated that a reader increased team performance by having situational awareness and improved communication (Harrison et al., 2006; Ranganathan et al., 2014). Any competent OR team member may take on the role of a reader (Dagey, 2017). Staff must recognize the importance of dedicating a person who can confidently read from the cognitive aid in a crisis.

In conclusion, in order to successfully integrate a cognitive aid, leadership support, simulation training, and a reader position must exist (Goldhaber-Fiebert & Howard, 2013; Huang et al., 2018). Cognitive aids were seen as a method to promote a positive, safe, culture change.

**Barriers to Implementation of a Cognitive Aid.** Barriers against the initiation of a cognitive aid were presented in the readings. One barrier was lack of staff to organize simulation training and proper introduction of the manual (Dagey, 2017; Huang et al., 2019). Another barrier was the culture of medicine and cognitive aid perception. For instance, some physicians believed that a checklist was too restrictive (Spiess, 2013). Also, some providers felt that a cognitive aid gave a negative perception to others and appeared as a weakness and a threat to

one's autonomy (Goldhaber-Fiebert et al., 2015; Harrison et al., 2006; Hey & Turner, 2016). Providers who were apathetic about the process are also a hindrance to the implementation of the cognitive aid (Alidina et al., 2018). Another barrier was forgetting that the cognitive aid was available in the midst of the fast-paced culture of the OR (Alidina et al., 2018; Goldhaber-Fiebert et al., 2015; Huang et al., 2019). Lastly, wrong assessment and diagnosis of a crisis may lead to an adverse outcome (Ranganathan et al., 2014). While barriers do exist, it is important to recognize and overcome these adversities.

**Confidence.** A cognitive aid may help increase confidence of staff members (Huang et al., 2019). A facility utilized an Operating Room Comprehensive Unit Based Safety Program team. This team was utilized during an emergency to strengthen the staffs' confidence in managing an OR crisis (Dagey, 2017). This same team implemented 90-minute education sessions, simulations, and debriefings which enabled 80% of participating staff to have increased confidence when involved in a cardiac arrest (Dagey, 2017). At Massachusetts General Hospital, all participants said the cognitive aids decreased stress and improved confidence (Bereknyei Merrell et al., 2018). The Hey Clinic for Scoliosis and Spine Surgery in North Carolina also reported that a cognitive aid decreased errors and increased self-confidence (Hey & Turner, 2016). From the literature, confidence and cognitive aid use were positively correlated.

**Further Research Needed.** While research has been done on the best methods of cognitive aid implementation, there was room for improvement (Marshall, 2017). One topic the lacks extensive research was the best location to easily access the cognitive aid. Currently, the best location is near the equipment most likely to be used during a crisis (Marshall, 2017). Another area of inadequate research was that when "crisis" becomes universally defined, more research was needed to standardize OR crisis management. In China, providers had a different

view on what constitutes a crisis situation in need of a cognitive aid (Huang et al., 2019).

Research in these areas will increase utilization of this patient safety device.

### ***Summary of Supportive Evidence***

In summary, this comprehensive literature review of cognitive aids detailed the history and landmark studies, necessity, implementation methods, increase in confidence, and further research needed. As mentioned, there will be barriers encountered when initiating cognitive aids. By working through those barriers and initiating a cognitive aid, such as the Stanford Emergency Manual, there will be improved communication, teamwork, and patient safety during an OR crisis (ACOG, 2016). In the literature, the Stanford Emergency Manual resulted in increased crisis management skills (Bereknyei Merrell et al., 2018). The Stanford Emergency Manual implementation at Parkview Noble Hospital was an important adjunct to patient safety during the perioperative period.

## **Chapter 3: Project Design**

### **Methodology**

#### ***Project Design***

This DNP Scholarly Project was a project guided by evidence-based practice. The QI project was designed to improve patient outcomes and initiate a practice improvement at Parkview Noble Hospital. The goals of the QI project were to increase participants' knowledge of proper use of the Stanford Emergency Manual (e.g. use the manual to look up a critical step in crisis management versus relying on memory alone) and to improve participants' confidence regarding skills in crisis management. In order to meet these goals, an educational PowerPoint presentation on the importance of crisis management with the Stanford Emergency Manual was provided along with a MH simulation in which participants utilized the Manual to effectively manage the MH crisis.

## *Methods*

**Kaizen Event.** A Kaizen event was a method used for the QI project. Kaizen, a Japanese word for “improvement” and “change for the good”, was a method to focus on the implementation of a sustainable, cultural change (Belson, 2016). A Kaizen event was a project that was completed within a set time frame with mentors who were familiar with the improvement process. It was an ongoing change process (Belson, 2016). The person(s) most impacted by the event was identified followed by the areas to be improved. The Kaizen Event was known for producing short term goals, thus aiding in the gradual acceptance of change. Once staff members saw that change was doable and could be completed in a short time frame, there was incentive to continue with change initiatives. At Parkview Noble Hospital, the person(s) mostly affected were future patients and the intervention was the Manual implementation.

The following are steps in the Kaizen event (Belson, 2016):

1. **Identify the topic of interest and assemble a team to complete the project:** The topic of interest was the introduction of the Stanford Emergency Manual at Parkview Noble Hospital and the team used was the 12 perioperative staff members who volunteered.
2. **Discuss the current situation and the desired goals at the time of the project completion:** There was not a standard process in place to manage a crisis nor was the team aware of the Stanford Emergency Manual to manage a crisis. After the project was completed, a crisis manual was present in each OR and staff gained the knowledge to use the Emergency Manual.
3. **Kaizen encourages team thinking and encourages an attitude that is willing to learn and inquire:** Every interaction was an opportunity to have participants ask questions and

learn. Team thinking was demonstrated by participants discussing the scenario steps during the simulated MH crisis, reading from the Manual, and listening from the Emergency Manual's crisis management steps.

4. **Decide on the improvement method and goals that are specific, measurable, attainable, and time sensitive (SMART):** Specific goals were to increase participants actions of using the Emergency Manual as well as increase confidence in crisis management. The improvement methods were the PowerPoint educational session and the simulation. Goals were measured using the pre/post-knowledge test and the SET-M tool. The time for the intervention to occur was on the implementation day.
5. **Implement the project and determine a method to sustain the initiative:** The project was implemented by the project manager on January 12, 2021. A method for sustainment was the provision of seven Stanford Emergency Manuals to Parkview Noble Hospital along with relaying the importance of frequent simulation training and Emergency Manual review to the participants.
6. **Congratulate staff and relay the importance of their input into the project:** Staff were congratulated for their participation, desire to learn about crisis management, and work during the implementation process. If participants felt that they were an integral part of the improvement process, they would desire to see the change sustained.

**Poka-Yoke Technique.** The Poka-Yoke technique was another method desired to help with the implementation of the Manual at Parkview Noble Hospital. Poka-Yoke is Japanese for “mistake proofing” and could have helped with the solidification and implementation of the QI project (Belson, 2016). Poka-Yoke techniques were meant to be “simple, inexpensive and fail-safe” (Dvorak, 1998). An example of this inexpensive method in action was reported by John

Grout, a representative from Berry's College. Grout reported that 1,500 of the fail-safe devices that Lucent Technologies used, cost less than \$100 and saved the company \$8.4 million dollars (Dvorak, 1998). Application of the Poka-Yoke technique to the DNP scholarly project would have consisted of taping an outline of the Stanford Manual on the anesthesia cart, making it noticeable if the Manual was not in the correct location. Even though this process did not occur at the time of the QI project implementation due to the change in location to the endoscopy unit, the project manager encouraged participants to carry out this technique. Figure 3.1 pictures the Poka-Yoke technique.

**Figure 3.1**



Example of the Poke-Yoke technique.

[https://www.queri.research.va.gov/implementation/quality\\_improvement/methods.cfm?method=](https://www.queri.research.va.gov/implementation/quality_improvement/methods.cfm?method=)

[35](#)

### ***Ethical Considerations***

Ethical concerns were not identified for the QI project. Prior to the implementation of the project, IRB approval from USF was obtained and the project manager received the implementation approval form from USF. Heather Antal, OR director at Parkview Noble Hospital signed the letter of exemption from Parkview Noble's IRB. The participants each

voluntarily read and signed the informed consent form before the project began which outlined that the QI project was a simulated environment, utilizing a mannequin, and that there were no added risks to the OR staff, outside of their normal work routine, and that the surveys and demographic information were kept anonymous and confidential throughout the project process. Furthermore, privacy was maintained as the results were stored in a locked filing cabinet. Participation was voluntary throughout QI project implementation and anyone could have declined to continue with the project at any point during the QI project implementation. The project manager completed Collaborative Institutional Training Initiative (CITI) training (see appendix J) in the early stages of the project planning. The project manager was prepared to uphold the ethical standards of Parkview Noble Hospital and USF throughout the project process.

### ***Project Schedule***

January of 2020 marked the beginning of the QI project. A comprehensive literature search took place in order to have a better understanding of the gap in practice. Throughout 2020 multiple steps in the QI project took place. During January through March 2020, multiple meetings, phone calls, and emails were completed in order to plan for the simulation and implementation of the project. The project manuscript was divided into separate parts for submission as part of NURS 638. During NURS 658, an organizational assessment, strengths-weaknesses-opportunities-threats (SWOT) analysis, budget planning, and a Gantt chart was drafted. In the following course, NURS 710, the methods for the project were planned which included formulating project aims and outcomes, selecting measurement tools, establishing a data collection and analysis plan for outcome evaluation, and constructing a preliminary dataset. In NURS 715, IRB preparation and submission were completed. The DNP project was

implemented on January 12, 2021. One day was set aside for the project implementation and data collection. Three weeks later, when returning to Parkview Noble Hospital to provide three additional manuals that were requested by participants, the project manager followed up with several of the participants and inquired as to whether the Emergency Manual was being utilized. The nurse lead stated that an Emergency Manual was now hanging in each OR. Dissemination of the QI project occurred on June 17, 2021.

### ***Implementation Methods***

**Pre-Survey.** The project day occurred on January 12, 2021. Participants gathered in the meeting room where the project manager introduced herself and the purpose of the project. Staff completed the informed consent form which detailed the purpose of the project, risks, benefits, and the project manager's contact information. Next, the staff who agreed to participate filled out a demographic data form, a pre-test, and the SET-M survey tool. The participants were instructed to fill out the "scenario" portion of the SET-M tool during the pre-survey period as the "prebriefing" and "debriefing" portions did not fit the aims of this portion of the QI project. The time to read the informed consent and fill out the forms was approximately 10 minutes. A PowerPoint presentation was then presented by the project manager utilizing her personal computer.

**PowerPoint.** A PowerPoint was presented to participants that discussed crisis management and the importance of the Stanford Emergency Manual. The PowerPoint began with an introduction on crisis management followed by the history of the Stanford Emergency Manual. The presentation took approximately 20 minutes. See appendix K for the learning objectives of the presentation.

**Simulation.** The next step in the QI project was simulation. During the prebriefing, participants were told that it would be a MH simulation. The goal was not to make them feel nervous but rather to prepare them to use the Emergency Manual and gain confidence with crisis management. It was important that everyone practiced in their normal, professional role in order to gain the most out of the experience. The project manager guided participants into the endoscopy room and conducted a prebriefing on the simulation expectations and the location of the Stanford Emergency Manual. All questions were answered in preparation to have the staff succeed. See appendix K for the learning objectives. The MH simulation was one provided by the Association of Operating Room Nurses (AORN). During the SIM 101 course, it was discussed that it is best to use simulation templates available versus creating one's own. The project manager emailed Professor Dawn Parker, MSN, RN, CNE, CHSE, School of Health Sciences simulation lab director at USF who agreed that the project manager should use a scenario that has been in existence.

**Debriefing and Post-Survey.** After the simulation, a debriefing session occurred. Participants gave their insights regarding the QI project experience. It was important that the project manager stress that debriefing was not meant to be punitive, but rather a way to implement the Emergency Manual at this facility. Prior to the conclusion of the project, participants completed the post-SET-M survey and the post-test. The project manager kept all results anonymous by storing data on her password protected computer and by keeping documents stored in a locked filing cabinet.

**Conclusion.** At the conclusion of the project, all participants were assured that the OR director would receive a copy of the data results after dissemination. Staff were assured that all anonymous results were stored in a locked filing cabinet and on the project manager's password

protected computer. These locations could only be accessed by the project manager. Staff were encouraged to contact the project manager with questions at any time. Several participants remained in the meeting room after the debriefing session to gain further insight on the Stanford Emergency Manual.

### ***Measurement Tools and Instruments***

Two different measurement tools were used for the QI project. The first tool was a knowledge test with verified face validity from three CRNAs and experts in anesthesia. The test was constructed using the Stanford Emergency Manual as a reference and was in the format of a pre-test and post-test. The pre-test was completed at the beginning of the QI project and the post-test was completed by participants at the conclusion of the project (see appendix E and F respectively). The second measurement tool was the Simulation Effectiveness Tool-Modified (SET-M) which was developed by Leighton, Ravert, Mudra, and Macintosh in 2015 and has been proven to be reliable and valid (see appendix C). Permission for the project manager to use the SET-M survey was granted by Dr. Leighton on April 29, 2020 (see appendix L). At the beginning of the QI project, the scenario portion of the SET-M was filled out by participants and the entire SET-M was completed at the end of the QI project.

### ***Evaluation Plan***

**Data Sources and Measures.** Multiple sources were utilized during evaluation. The first data source was the demographic questionnaire. Participants were given a numbered folder after signing informed consent, prior to the start of the QI project. In the folder was a demographic data form that provided the project manager data for analysis (see appendix D). Items addressed included age, vocation, number of years in that vocation, and prior simulation training. A second data source was the pre-test and post-test. These tests displayed five scenario questions from the

Emergency Manual. Participants had access to the Manual for use on the post-test, after it had been formally introduced. Use of Statistical Package for the Social Sciences (SPSS) enabled the project manager to compare the pre-test and post-test results. The last data source was the SET-M survey presented at the beginning and end of the QI project. See appendix M for the specific project measures outlined in a table format.

**Data Collection Methods.** The first data collection method was observation. The project manager observed the staff and completed notes immediately after the QI project regarding what was noticed during the project process. The second data collection method was by way of a focus group. This focus group met in a quiet meeting room where the post-simulation documents were filled out and debriefing occurred. The project manager was the facilitator of the debriefing session. The third data collection method was through written responses on the tests and surveys and anonymous subjective comments and critiques from participants. Subjective data was also collected from spoken remarks during the project process. Quantitative data was organized into SPSS and results were compiled based on each collection method and purpose.

**Data Analysis Plan.** During the summer of 2020, an analysis plan and a data dictionary for the QI project were constructed (see appendix M and N respectively). A summary of the aims, outcomes, and measures of the analysis plan follows.

1. **Aim 1:** Increase participants' action of accessing the Stanford Emergency Manual for crisis management when unsure of a critical step.

**Outcome 1a:** Participants will have increased awareness to access the Manual in a crisis event as evidenced by a 20% increase in total correct answers on the post-test compared to the pre-test.

**Measure 1a:** Pre-test/Post-test

- Outcome 1b:** Thirty percent of participants will recognize the importance of accessing the Manual when unsure of a critical step during crisis management as evidenced by Emergency Manual use on the post-test and/or during simulation.
- Measure 1b:** Pre-test/Post-test.
2. **Aim 2:** Increase participants' confidence in managing a simulated crisis.
- Outcome 2a:** The "scenario" score section on the SET-M tool will show an increase in confidence from the pre-SET-M to the post-SET-M scores.
- Measure 2a:** Pre/post-SET-M tool
- Outcome 2b:** Twenty percent of total "pre-briefing" SET-M scores reflected increased confidence when prebriefing occurred as evidenced by the result of *somewhat agree* (see SET-M tool) selected.
- Measure 2b:** Post-SET-M tool
3. **Aim 3:** Determine whether debriefing was a valuable component to the PowerPoint and MH simulation.
- Outcome 3a:** Twenty percent of scores reflected "somewhat agree" (see SET-M tool) in that debriefing was a valuable part of the QI project.
- Measure 3a:** Post-SET-M tool
- Outcome 3b:** Twenty percent of SET-M scores reflected "strongly agree" (see SET-M tool) in that debriefing was a valuable part of the QI project.
- Measure 3b:** Post-SET-M tool

The results of the tests and SET-M surveys were analyzed using SPSS and results were placed in a graphic display shown in chapter four and in the figures section at the end of this paper.

### *Dissemination Plan*

Dissemination of the findings of the QI project was important as participants willingly gave of their time and the IRB granted permission for the project manager to conduct this QI project. Dissemination involved presenting the final results to the stakeholders of the QI project. The project manager prepared a formal PowerPoint presentation in the form of an executive summary listing areas of the QI project such as purpose, aims, results of the QI project data analysis, and recommendations for practice. The PowerPoint was presented to staff at USF and results of the QI project were emailed to Parkview Noble Hospital's OR director after USF dissemination.

### *Implementation Process Analysis*

**Planning Stage.** Successful QI project implementation required quality planning. The project manager desired to increase staffs' awareness of the Emergency Manual when faced with an OR crisis and to increase staff members' confidence in this situation. This Manual had the potential to decrease financial costs of Parkview Noble Hospital as patient safety was increased. During this planning stage, Parkview Noble's management support was vital. Without the OR director or anesthesia director's permission to undertake the QI project, it would not have occurred. After a needs assessment and communication of the project goals and purpose to each stakeholder, a schedule was outlined to meet the DNP project objectives (see appendix K).

**Team Communication.** Frequent communication with the stakeholders of the project such as the DNP project mentor, USF stakeholders, and Parkview Noble stakeholders was vital to complete the project successfully. The goal was to address any barriers that arose prior to implementation. Problem solving and decision making occurred frequently and required a constant line of communication by the project manager. Clarity, requirements, resources,

stakeholders, time, and barriers were essential to keep in mind. Communication was done frequently with the DNP project advisor and with the OR director.

**Completion Phase.** The total cost of completing the QI project was approximately \$300. System factors were reviewed, and the project manager contemplated what might work better for the next QI project. The impact on patient care was evident as the Stanford Emergency Manual provided another means for the OR staff to safely care for the patient. The lessons learned included to plan early and plan often, remain flexible to unanticipated changes such as COVID - 19, and be sensitive to advice from others. Dr. Spath, the DNP project advisor, was helpful throughout the entire QI project process. The University of Saint Francis was influential in providing the project manager with the knowledge and ability to complete this DNP Scholarly Project.

## **Chapter 4: Results and Outcomes Analysis**

### **Data Collection Techniques**

Weeks prior to the implementation of the QI project, the project manager utilized a control group consisting of 20 registered nurses to take the five-question knowledge test that received face validity from three CRNAs with extensive healthcare experience. The control group was instructed to complete the five-question knowledge pre-test and place the test in a blank folder provided by the project manager. Each test was anonymous with no identifying information. After data was completed on the control group tests, results revealed that everyone missed at least two questions and 25% of participants missed all five questions. The control group provided the project manager with data showing that nurses do not regularly retain rarely used information.

The QI project implementation day consisted of 12 perioperative staff members from Parkview Noble Hospital. Demographic data revealed that participants were all female ages 25-

57. Vocations included registered nurse, scrub technician, and “other”. The years of experience in their designated vocations ranged from 2-33 years. Eleven staff members had previously completed simulation training. In the past, 11 staff members were involved in teamwork training and five staff members had completed simulated MH training. None of the participants were involved in a real life, actual, MH crisis.

Two data collection techniques were utilized during the project process, focus group (with subjective, anonymous comments) and written responses. The focus group was facilitated by the project manager. This focus group included all participants who met in a quiet meeting room where the presentation, completion of pre-simulation and post-simulation documents, and debriefing occurred. The second data collection method was through written responses on the five-question knowledge pre/post-test along with the pre/post-SET-M survey and anonymous, subjective comments from participants. Subjective data was also collected from spoken remarks during the project process.

### **Measures/Indicators**

The first aim was to increase participants’ action of accessing the Stanford Emergency Manual for crisis management when unsure of a critical step. The desired outcome was that participants would gain increased awareness to use the Manual as evidenced by a 20% increase in total correct answers on the post-test compared to the pre-test. The measurement tools were the five-question knowledge pre-test and the five-question knowledge post-test that consisted of the same five knowledge questions, were created using the Stanford Emergency Manual, and received face validity from experienced CRNAs.

Data calculation of the five-question knowledge pre and post-tests consisted of collecting a percentage of total correct answers for the pre-tests (45% correct answers) and the post-tests (96.67% correct answers). The result was a 51.67% increase in percentage points on the post-

test. Participants had access to the Emergency Manual for use on the post-test, after it had been formally introduced, as likewise, staff now had a copy of the Manual for each OR and gained the ability to access the Manual during an OR crisis. Figure 4.1 details the number of total correct and incorrect answers for each of the five knowledge questions on the pre-test. See the Figures section at the end of this paper for a larger view of figure 4.1.

**Figure 4.1**

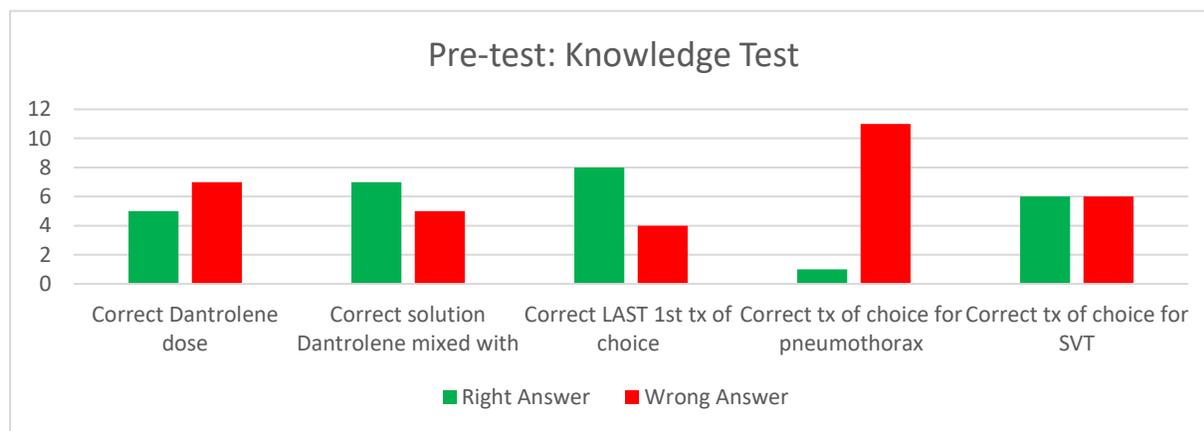
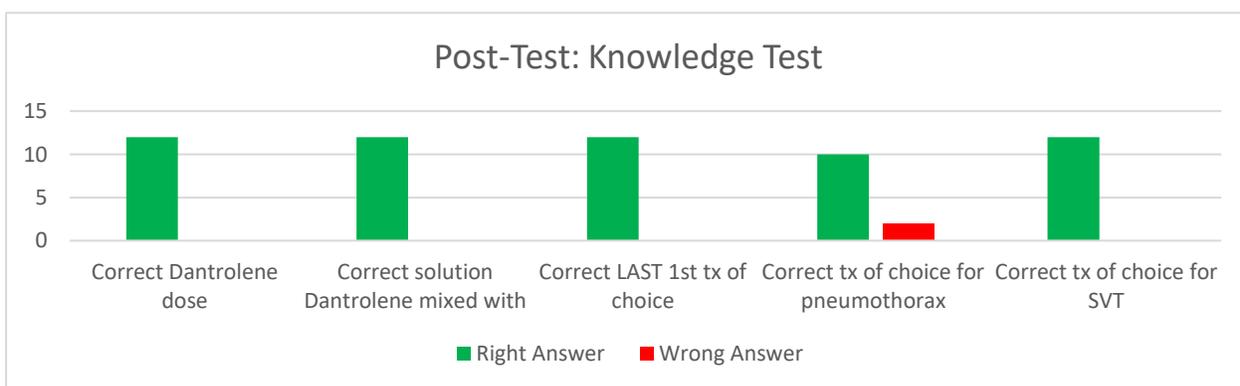


Figure 4.2 details the number of total correct and incorrect answers for each of the five knowledge questions on the post-test. See the Figures section for a larger view of figure 4.2.

**Figure 4.2**



The second desired outcome of Aim 1 was that 30% of participants will recognize the importance of accessing the Manual when unsure of a critical step during crisis management as

evidence by Manual use on the post-test and/or during the simulation. The post-test had six additional “yes” or “no” questions regarding the implementation day which helped to gather data to satisfy the outcome of Manual usage. The measure for this outcome was the five-question knowledge post-test which included two questions on the reverse side of the post-test stating “Did you use/access the Emergency Manual on this post-test?” and “Did you use/abide by the Emergency Manual during the simulation?”. The result was that 100% of participants used the Emergency Manual on the post-test and/or the simulation, and 100% stated *very likely* when asked “How likely are you to use the Manual when faced with a crisis?”.

The second aim of the QI project was to increase participants’ confidence in managing a simulated crisis. The measure used was the SET-M tool, which consisted of 12 questions in the “scenario” portion of the tool. The scenario questions pertained to confidence and users were to rank their answer on the Likert scale provided. The desired outcome of this aim was that the “scenario” score sections on the SET-M tool would show an increase in confidence from the pre-SET-M scenario scores to the post SET-M scenario scores. There was not a set benchmark for the increased confidence, just simply that confidence increased as a result of the QI project.

Originally, there were 144 total possible answer responses included in the scenario questions on the SET-M tool (12 participants were instructed to complete 12 Likert choices both on the pre-SET-M and post-SET-M “scenario” section). On the pre-SET-M, two participants neglected to fill out the 12 Likert questions, along with one participant who also neglected to complete question five. Thus, there was a total of 119 answers on the scenario portion of the pre-SET-M. The results showed that 2.52% of scores reflected *do not agree*, 78.15% of scores reflected *somewhat agree* and 19.32% of scores reflected *strongly agree* in regard to confidence.

On the post-SET-M, only one participant neglected to complete question four on the post-SET-M tool. Therefore, a total of 143 answers were selected on the scenario portion of the post-SET-M tool. Results showed that 1.39% of scores reflected *do not agree*, 29.37% of scores reflected *somewhat agree*, and 69.23% of scores reflected *strongly agree* in regard to increased confidence from pre-scenario to post-scenario on the post-SET-M tool.

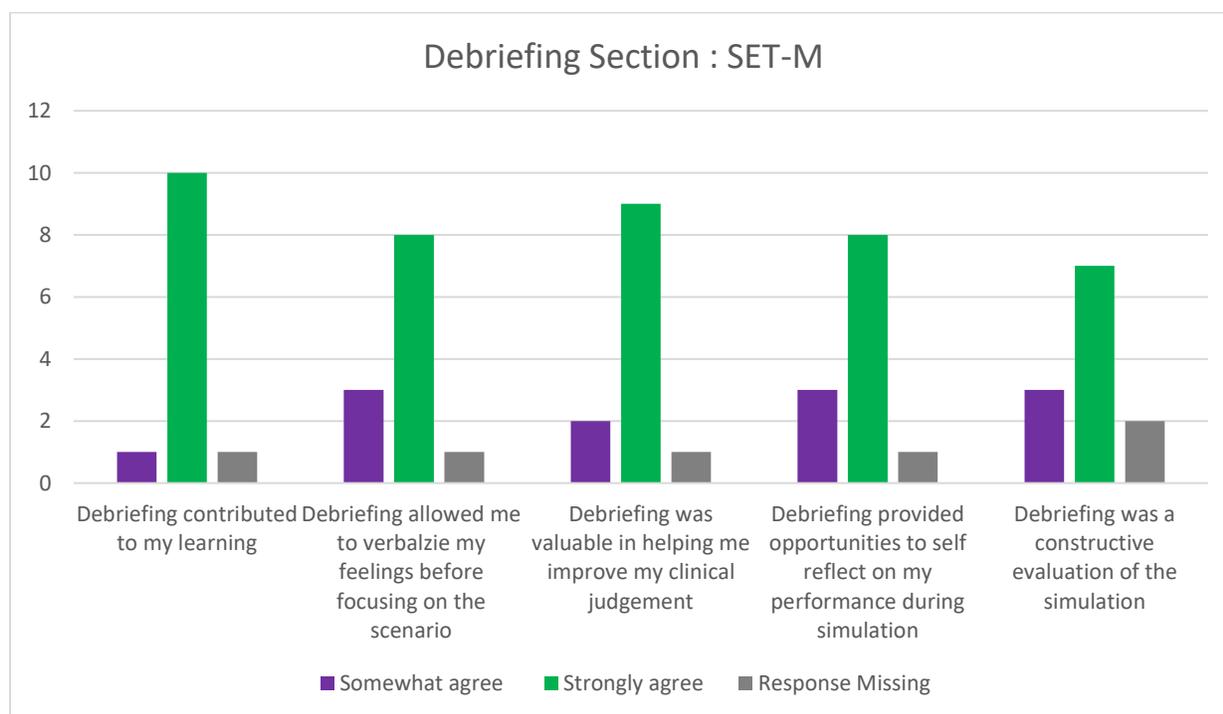
Though the pre-SET-M tool had 119 total answers and the post-SET-M tool had 143 total answers, the results from the *strongly agree* category were substantial enough that the project manager focused on that category result. Also, results showed while the majority of results on the pre-SET-M displayed *somewhat agree*, while on the post-SET-M the majority of results stated *strongly agree*. The Figures section on page 118 states each question on the scenario portion of the pre-SET-M tool. The y axis correlates with the number of participants that selected each answer choice for each of the 12 scenario questions. Figure 4.4 in the Figures section on page 119 states each question on the scenario portion of the post SET-M tool. The y axis correlates with the number of participants that selected that answer choice for each of the 12 scenario questions.

When simulation pre-briefing occurred, increased confidence of participants was also examined as a second specific outcome for Aim 2. The project manager desired that 20% of total post SET-M scores of the pre-briefing question, “Pre-briefing increased by confidence” would show *somewhat agree*. Eleven participants completed the question and results showed that 45.45% of the total scores of the post-Set-M tool “pre-briefing” section showed *somewhat agree* and 54.54% of total scores stated *strongly agree*.

The last aim of the QI project was to examine whether debriefing was a valuable component to this educational learning QI project. The measure used was the post SET-M tool

and the five questions under the “debriefing” section. One participant did not complete the debriefing section along with another participant who did not complete question five on the “debriefing” section. Hence, there were 54 total answers responses which were used to calculate the percentage result. The desired outcome was that at least 20% of scores would reflect *somewhat agree*. Data analysis showed that 22.22% of the debriefing scores stated *somewhat agree* and 77.77% of all the debriefing scores stated *strongly agree*. The Figure 4.5 displays the number of participants for each question on the y axis and the individual five questions on the x axis. See the Figures section for a larger view of figure 4.5.

**Figure 4.5**



### Data Analysis Inferences

Several inferences were gained by the DNP project. First, when a cognitive aid is used, participants are more likely to complete the correct step in a crisis. When the Stanford Manual

was accessed on the post-test, 96.67% of the answers were correct versus the pre-test which had 45% correct answers. Second, when given a cognitive aid, there is a good probability that participants will access it. During the project implementation, 100% of staff accessed the Manual at least once. A third inference is that when a cognitive aid is available, confidence during crisis management increases. Increased confidence was evidenced by the post-SET-M scenario section scores showing that 69.23% of the participants answers stating *strongly agree* for increased confidence after the Emergency Manual was introduced and the simulation was implemented. Fourth, pre-briefing increased confidence during a simulation experience. The last inference gained was that 77.77% of results on the “debriefing” section of the post SET-M test stated *strongly agree* in regard to the fact that debriefing was perceived to be a valuable asset to a simulation. Subjective comments from participants are added below to demonstrate the effectiveness of the QI project.

Anonymous Comments included:

*“Good. Book helpful, feels like when under pressure shuts down. Excited for book.”*

*“Good. Great reinforcement. Love the quick reference.”*

*“Liked it. Could have been clearer with directions at beginning on what to fill out, tests, etc.”*

*“Power point great. Simulation would have been better if cut into smaller groups. Might have been more beneficial.”*

*“Fine, wish more of hands on with simulation.”*

*“Love the books. Great resource, especially when we are here after hours with minimal staff.”*

*“Simulation needed make into smaller groups. Excited for book.”*

*“Straightforward and good information.”*

*“Very well presented. Thank you for bringing it to us and presenting a learning experience.”*

## **Gaps**

The only gaps encountered for the data analysis were on the SET-M survey. Due to the hurried nature of the instructions at the beginning of the project implementation, the project manager was not as clear as she could have been in regard to completing the SET-M survey. The project manager relayed to staff to complete the “scenario” portion of the SET-M survey at the beginning of the project implementation and that the “pre-briefing and debriefing” portions would be used for the post SET-M survey. None of the staff asked questions when completing the forms prior to the PowerPoint. The project manager believed participants understood the directions. Then, after the simulation and debriefing, staff were instructed to complete the post-SET-M survey in its entirety (e.g. prebriefing, survey, and debriefing portions). Several desired responses on the pre/post-SET-M tool were missing as a result of the uncertainty of the participants and a lack of instruction from the project manager. Even though these responses were missing, the project manager still captured significant data.

## **Unanticipated Consequences**

The major unpredicted consequence was the COVID-19 pandemic. While it did not negatively impact the number of project participants, it did impact the SET-M survey data and simulation. Originally, the project manager intended to formally introduce the QI project to participants weeks in advance in order to prepare for the number of staff participating in the PowerPoint and the simulation. Instead, the project manager could only be present at the scheduled time on implementation day. She had roughly ten minutes to set up the supplies for the project implementation. Time spent in preparation took time from the project implementation. The project manager assured the OR director that she would heed the implementation time allotment.

The project manager was pleased that 12 participants were present for the QI project. While the educational PowerPoint was not affected, the simulation was. The project manager originally planned to do two groups of participants for the simulation. Instead, as a result of the time constraints, one simulation occurred. Because there were more people than simulation roles, only half of the staff were able to play a role in the simulation while others stood and observed. The simulation was not as beneficial as the project manager would have liked, as evidenced by the post-SET-M scores. COVID-19 made the in-person planning difficult. However, the project manager successfully implemented the QI project at Parkview Noble Hospital.

### **Expenditures**

The major expenditures for the QI project included the printing of the Stanford Emergency Manuals and SPSS used for data analysis. The Emergency Manuals cost the project manager \$210 and SPSS cost approximately \$90 per year. While the SPSS did provide accurate statistical results, it was a cost to the project. Another expenditure was for fuel to get to Parkview Nobel Hospital for project implementation. The project manager did not live close to the Parkview facility, thus had an hour drive to the facility in order to implement the QI project.

## **Chapter 5: Leadership and Management**

### **Organizational Culture**

This DNP project was an innovative process of introducing the Stanford Emergency Manual to the perioperative staff at Parkview Noble Hospital. In order for the QI project to be successful and sustainable, Parkview Noble Hospital's leadership support was required along with the attainment of an environmental assessment (Williams, 2016). The QI project also required innovativeness from the perioperative staff participants. According to Joseph (2015), innovativeness consists of people who are committed to the innovation in order for it to come to

fruition. Furthermore, a thorough organizational assessment (OA) was conducted by the project manager to better assess the culture, goals, and vision of Parkview Noble Hospital. The following paragraphs provide a detailed OA using the Institutional and Organizational Assessment (IOA) Model.

### ***Institutional and Organizational Assessment Model***

The Universalia Institutional and Organizational Assessment (IOA) Model was chosen as a framework to guide the project manager. The objectives of the IOA Model were to increase the unit's performance while addressing specific strengths and weaknesses of Parkview Noble Hospital (Reflect & Learn, n.d.). Within this model, categories such as organizational motivation, external environment, organizational capacity, and organizational performance were addressed in order to gain an accurate OA (Reflect & Learn, n.d.). The assessment of the environment helped to determine whether the Emergency Manual would be a viable option for crisis management sustainability at Parkview Noble Hospital.

**Organizational Motivation.** The first category of an OA in the IOA Model was organizational motivation and included subcategories such as history, mission, culture, and incentives. Parkview Noble Hospital is one of nine Parkview Health facilities. Parkview Noble Hospital's success in the community of Kendallville, Indiana was largely due to a gentleman named Elmer McCray. During the late 1800s, McCray and his father collected eggs and butter around the Kendallville area by way of horse and buggy (Householder, 2018). In order to keep the dairy from spoiling, the two men built a "cold room" and later established the McCray Refrigerator Company in 1890, one of the largest refrigerator companies in the world (Householder, 2018). McCray truly cared for those in his community and was eager to serve Kendallville. He served as president of Lakeside Hospital, a hospital founded in 1912 and to

which Elmer McCray donated significant sums of money (Housholder, 2018; Parkview Health, 2018). Later, Lakeside Hospital became known as McCray Memorial Hospital in honor of Elmer McCray (Housholder, 2018). In 2000, Parkview Health System bought McCray Memorial Hospital (Parkview Health, 2018). Currently, the hospital is known as Parkview Noble Hospital.

The mission of Parkview Health and Parkview Noble Hospital was to maintain care and compassion and to improve patients' well-being. Their mission statement read "Providing the excellence, innovation and value you seek in terms of convenience, compassion, service, cost and quality" (Parkview Health, 2020). The support for the project manager to complete the innovative QI project was an example of how Parkview Noble Hospital fulfills the mission statement.

The culture of a unit was one of the most important aspects that determines the success of change (Williams, 2016). Thomas et al. (1990) believed that an organizational culture includes the manner of "thinking, behaving, and believing that members have in common" (as cited in Ingersoll et al., 2000). Furthermore, the culture of an organization includes attitudes, actions, behaviors, and standards that are specific to the facility or unit (Schein, 2010). If Parkview Noble Hospital's perioperative unit and OR staff had possessed a stagnant culture, then presenting the Stanford Manual would have been unsuccessful and disregarded. Because the environment fostered change and learning, the project manager felt supported during the DNP project implementation of the Stanford Emergency Manual.

Organizational incentives included the manner in which Parkview Noble Hospital acquired staff for the unit and recognized employees for their service (Lusthaus, et al., 2002). From time spent with the anesthesia providers and inquiring the reasons for joining Parkview Noble Hospital, it was apparent to the project manager that financial compensation and the small

community hospital culture appealed to the providers. Through casual communication with multiple OR nurses, the project manager learned that there was incentive for overtime at the facility. When reflecting on the QI project, it would have been an incentive for more staff to participate if compensation would have been provided; however, the project manager did not want compensation to affect voluntary participation, nor could she financially provide compensation to participants. Prior to the implementation of the QI project, an informed consent was signed by each participant stating that financial reimbursement was not allotted. However, the project manager voiced great appreciation for each staff member's participation. The history, mission, culture, and incentives of Parkview Noble Hospital reassured the project manager that the organization would support the innovativeness desired.

**External Environment.** Second, the external environment was essential for an organization to survive. Subcategories such as equality, political, social, economic, stakeholder, and technology influenced the organization (Reflect & Learn, n.d.). Parkview Noble Hospital was a non-for-profit facility. Parkview Health has a history of investing back into the community because they are owned by the community rather than a specific group of stakeholders (Parkview Health, 2020). Parkview Noble Hospital treated patients equally despite insurance coverage or lack thereof. The project manager witnessed the perioperative nurses care for patients from different backgrounds with equality and respect. Parkview Health was also a social leader in the community. Campaigns such as "Don't Text and Drive" and "Share the Road" were implemented as an emphasis for a safe culture and community (Parkview Health, 2020). Parkview Noble Hospital welcomed student registered nurse anesthetists (SRNAs), nursing students, radiology students, and high school students with healthcare interests to complete clinical and observation time. From a social standpoint, the OR and perioperative unit were a

safe, encouraging, learning environment during the project manager's clinical assignment. Preceptors, nurses, and the perioperative staff were encouraging as the project manager completed training at Parkview Noble Hospital.

Technology was another subcategory of the external environment under the IOA Model. Parkview Health excelled in this category with the creation of the Mirro Center for Research and Innovation. Advanced technology in simulation existed such as the Advanced Medical Simulation Lab, Advanced Medical Mobile Simulation Lab, and medical simulation technology. The Advanced Medical Simulation Lab was equipped with medical mannequins that are able to respond to medications, cry, bleed, and show pupil response. Furthermore, 3-dimensional virtual reality systems were available that enable the practice of endovascular procedures with fluoroscopy, give training for general surgery, and provide training for bronchoscopy and endoscopy procedures (Parkview Health, 2020). These technological advances provided Parkview Noble Hospital's perioperative staff the advantage of learning and perfecting skills in a controlled environment. One of the simulation supervisors of the Mirro Center, was contacted by the project manager to assist with the simulation aspect of the QI project. Unfortunately, due to COVID-19 precautions, the simulation supervisor was unable to assist with the project manager's simulation. Nonetheless, after the external environment assessment, it was evident that quality opportunities existed for the perioperative staff at Parkview Noble Hospital.

**Organizational Capacity.** Organizational capacity was the third category of the IOA model. It included leadership, financial management, process management, human resources, infrastructure, and structure. Salopek (1998) listed four essentials of a leader-collaborator, innovator, integrator, and producer (as cited in Lusthaus et al., 2002). Parkview Noble Hospital's OR director was a leader who encouraged collaboration. She was observed having

interprofessional collaboration with surgeons, the anesthesia director, nurse anesthetists, the secretary, and the perioperative staff. For example, this collaboration was evidenced by the OR director having a meeting with the chief of anesthesia regarding who was in authority and able to cancel cases. It was a very collegial, professional scene. Another collaboration example was that on a regular basis, the OR director was seen talking to perioperative nurses, addressing patient situations with providers, and present in her open-door office for staff to communicate with her. According to Williams (2016), strong leaders provided support for staff to accomplish innovation and welcome an array of ideas. When the project manager inquired about completing the QI project at Parkview Noble Hospital, the OR director agreed without hesitation.

Lusthaus et al. (2002) defined the operating structure of an organization as the group of people working towards the common goal. The structure of Parkview Noble was focused on the patient and community (Parkview Health, 2020). The project manager witnessed quality teamwork when an emergent surgical case was called. Staff members all assisted to prepare the OR quickly and to assure tasks were done for surgery to begin. It was evident that the staff knew that the common goal was to provide quality care for the patient.

The next part of the organizational capacity dealt with human resources. According to the Lusthaus et al. (2002), a human resource plan includes training new staff to fulfill the role of an organization. Parkview Noble Hospital had staff that were both new nurses and experienced nurses. With nurses beginning their career at Parkview Noble Hospital, the project manager knew that an innovative project for crisis management should be presented.

The last subcategory under organizational capacity was financial management. Leaders in the community who are involved on the board for Parkview Health and Parkview Noble Hospital stated that “their earnings are reinvested for the benefit of the community” (Parkview Health,

2020). Without being an employee at Parkview Noble Hospital, it was difficult to understand the individual finances of the facility. Financial obligations of the DNP project were not discussed as the project manager assumed the costs of printing and preparing the Manuals for Parkview Noble Hospital. The organizational capacity of the facility was largely obtained through direct communication and observation of the leadership, infrastructure, process management, and human resource structures.

**Organizational Performance.** The final category of the IOA model was organizational performance and included effectiveness, efficiency, relevance, and financial viability. The effectiveness and efficiency of a facility was individualized and was largely determined by the stakeholders (Lusthaus et al., 2002). Because Parkview Noble was a non-for-profit facility owned by the community, the facility is ethically responsible to support the community (Parkview Health, 2020). Each staff member had a role in the overall performance of the unit and they each performed exceptionally well. Patients told the project manager how much they enjoyed the staff at Parkview Noble Hospital. Lusthaus et al. (2002) reported that one must know the purpose of the facility in order to determine the effectiveness. For Parkview Noble Hospital the purpose related back to the vision and mission statement. With patients' safety at the mindset of implementing the Stanford Emergency Manual, the QI project was an appropriate fit for the small, rural, community hospital.

Efficiency related to the ability to use resources that were provided to Parkview Noble Hospital (Lusthaus et al., 2002). When the project manager asked about implementing the Stanford Emergency Manual, the OR director approved the idea knowing that although crises do not commonly occur, the OR staff should be prepared. The output of patient safety was greater than the financial input of providing the Emergency Manual. Relevance, another subcategory of

the organization performance section was also assessed. Lusthaus et al (2002) stated that a unit that can adapt to change and remain a relevant healthcare center will be sustained. The Mirro Center for Research and Innovation excelled in this area as Parkview Health desired to remain a relevant organization for evidenced-based practice in healthcare.

The last subset of organizational performance was financial viability. Though a non-for-profit facility, Parkview Noble should have produced revenue in excess of expenses (Lusthaus et al., 2002). When introducing the Stanford Emergency Manual, the project manager relayed to the OR director that the manual was a free download and that the project manager would provide the Manuals for the organization. Organization performance was demonstrated by the healthcare provided, patients' opinions, and the facility's acceptance of the Stanford Emergency Manual.

**Organizational Culture Summary.** In conclusion an organizational assessment is a technique used to thoroughly assess the culture, goals, and vision of a facility (Moran, 2020). Furthermore, the success of Parkview Noble Hospital was largely due to the culture present and was outlined by the assessment of the environment (Williams, 2016). Completing the OA provided the project manager with further insight on the organization and the perioperative surgical unit. Time spent applying the IOA model to Parkview Noble enabled keen incites to be gathered in the areas of organizational motivation, external environment, organizational capacity, and organizational performance. The project manager gained the ability to address areas that needed improved, identify best practice, and gain support for the innovation of the Stanford Emergency Manual (Moran, 2020). The most important aspect of the OA is that that the QI project remained in accordance with the mission of the facility (Moran, 2020). Parkview Noble Hospital was a facility that fostered change, learning, and innovation. The DNP QI project was

made possible because the perioperative unit at Parkview Noble Hospital believed in change and in fostering innovativeness for the benefit of patient safety.

### **Change Strategy**

The change strategy that guided the DNP project was Pettigrew and Whipp's Model of Strategic Change. This model, developed by Pettigrew and Whipp (1991) discussed how context, content, and processes influenced change (White, 2016). Context involves the factors causing change to occur, the reason for change, the change setting, and the organization involved in change (White, 2016). The context involved the project manager's task of implementing the desired change at Parkview Noble Hospital in the perioperative setting.

Next is the content of change or what is being changed. The change desired was to address the lack of standardized crisis management for Parkview Noble Hospital's perioperative unit. The goal was to implement an evidenced-based practice approach to crisis management in the form of the Stanford Emergency Manual. The desire was to help participants gain the knowledge to know what tool to access in the event of a perioperative crisis, how to use the tool, and to increase their confidence in managing the crisis.

The last section of this strategy is the process of how change will happen and the new strategies to be initiated (White, 2016). The change process occurred after participants were educated on implementation day by a presentation and a crisis simulation. Participants were receptive of the crisis strategy in the form of the Emergency Manual. The project manager returned to the facility three weeks later in order to provide three additional Emergency Manuals that were requested and to follow up with the status of the Manual use. Staff stated that they had already placed one Manual in each OR in a designated location and one Manual in the postoperative care unit (PACU).

Pettigrew and Whipp's Model of Strategic Change was helpful to outline the change process for the project manager. Change was not guaranteed, but with sufficient evidence and enthusiasm from the project manager, change occurred. The strategy involving context, content, and processes were all necessary for successful Emergency Manual implementation at Parkview Noble Hospital.

### **Leadership Style**

For this DNP project, transformational leadership was exhibited. The transformational leadership style required one to be a quality communicator, trusting, honest, responsible, and committed (Grossman & Valiga, 2017). Moreover, transformational leadership expressed vigilance in pursuing a vision or an innovation (Grossman & Valiga, 2017). As a transformational leader, the project manager was passionate about communication in a professional, yet succinct, manner and was focused on change throughout the project. This leadership trait was known to Parkview Noble Hospital as their OR director favored evidenced-based practice and was committed to seeing quality change for the facility. When communication between the project manager and the OR director was sluggish, there were reasons for the delay in communication and management reiterated their commitment to have the project implemented.

During the planning stage, circumstances-such as a global pandemic-presented and change had to be initiated. Transformational leadership traits were seen as the project manager was persistent in planning in order to meet the deadlines for the QI project implementation. COVID-19 was an example where transformational leadership was pivotal. Communication had to be done primarily via email and telephone as social distancing decreased interactions with participants at Parkview Noble Hospital. All the while, the project manager had to maintain the

enthusiasm for the project and had to prepare early for the innovation despite the global pandemic.

The project manager recognized that a transformational leader was one who instilled a passion of excellence in the followers. Grossman and Valiga (2017) stated that a transformational leader creates an environment where others have a growth mindset and feel that they can contribute to the decision-making process. Following project implementation, several participants determined the location for the Emergency Manual to hang in the OR. In essence, they contributed to the decision-making process. Participants requested three more Emergency Manuals—two for the endoscopy rooms and one more for the preoperative unit—thus, exhibiting the ability for participants to have a personal investment in the QI project plan.

As a result of the project manager's clinical rotation at Parkview Noble Hospital during the fall of 2019, the project manager had time to begin to show transformational leadership traits to staff. During clinical, the project manager received compliments on her clinical skills. While the project manager was not seeking to gain compliments, it enabled her to become known as a leader. When the project manager approached the OR director with the idea of the Stanford Emergency Manual for the OR environment, the OR director, chief of anesthesia, and the perioperative staff were all supportive. During implementation, the project manager had to show the key transformational leadership traits such as commitment, honesty, and quality communication in order for the Stanford Emergency Manual to be accepted as a QI initiative.

### **Interprofessional Collaboration**

Interprofessional collaboration was defined as the interaction of different professionals for a particular process or intervention (Conrad, 2020). Interprofessional collaboration was a key determinant of the success of the DNP project. Professionals such as the OR director, the chief of anesthesia, registered nurses, licensed practical nurses, surgical technicians, operating room

assistants, the doctoral faculty advisor, nursing anesthesia faculty, a student mentor, and the project manager were all professionals who had to communicate with each other in order for the Stanford Emergency Manual to be implemented. The project manager had demonstrated persistent interprofessional collaboration during the planning of the project. Because COVID-19 prevented face-to-face communication, much planning had to occur over the telephone and via email. The project manager had to demonstrate persistence, patience, diligence, planning, and organization in order to assure that the planning progressed to project implementation.

According to the American Association of Colleges of Nursing (AACN) (2015), a faculty member who has earned a doctorate degree will be a value asset to the project manager (as cited in Conrad, 2020, p. 190). The project manager diligently participated in interprofessional collaboration with her advisor Dr. Spath. When issues arose during the planning and preparation stages, Dr. Spath was a constant source of advice and leadership. Having earned her PhD, Dr. Spath provided a research viewpoint at times, which helped the project manager view information from a different perspective. During the QI project process, interprofessional collaboration was a learned trait that was developed by the project manager.

### **Conflict Management**

Conflict was defined as competitive or opposing action of incompatibles (Merriam-Webster, 2021). Conflict was inevitable during a change process and could yield negative or positive outcomes depending on how a person responds to a situation (Watson, 2017). In healthcare, conflicts often stem from decision-making authority and interprofessional roles (Shin, 2009). According to Watson (2017), when it comes to conflict management, people act in a learned way and are often disappointed with the outcome of the conflict situation (Watson, 2017). Recognizing that conflict is unavoidable, the project manager prepared for unexpected circumstances during the project process.

During the planning stages, a conflict arose in the mind of the DNP project advisor. The manager had sent multiple emails to the OR director at Parkview Noble Hospital and did not receive any response for several months. After time spent contemplating and doubting, the project manager sought guidance from her student mentor. The mentor told her to remain persistent. After another email was sent, without a response, the project manager sought guidance from her advisor, Dr. Spath. After a phone call with the chief of anesthesia, the project manager learned that Parkview Network had blocked all outside emails sent to Parkview Noble Hospital. In essence, the OR director had never even received the emails to begin with. The project manager was relieved to know that the emails were not being ignored by the OR director.

Two weeks prior to the implementation day, the project manager learned that outside guests were not permitted to come to the facility due to COVID-19 precautions. The project manager was prepared to do anything necessary to implement the project in person versus virtually. She assured the OR director that she would keep the project to an hour in length, would screen for signs and symptoms of COVID-19 prior to coming, and would bring all the supplies needed. The project manager was granted approval to present the QI project-in person- on January 12, 2021 with the understanding that this was a very special request and the QI project must be completed in a timely manner.

While there was potential for conflict to occur, the project manager was prepared to complete the project virtually, if necessary. However, the OR director understood the importance of an in-person implementation. Conflict was a potential for the QI project. The project manager was reminded to utilize interprofessional communication to resolve the conflict at hand.

The implementation day looked different than the project manager anticipated. Instead of coming weeks in advance to place fliers and a sign-up sheet for the simulation, the project

manager was only able to come the day of implementation. Instead of completing the simulation in an OR as planned, the simulation was completed in an endoscopy suite equipped with a ventilator. Rather than using the MH supplies at Parkview Noble Hospital, the project manager had to bring outside supplies in order to minimize contact with supplies at the facility. Also, the project manager was unable to go to the facility in advance and set up for the simulation, but rather had to assemble the simulation supplies in the few minutes preceding the PowerPoint presentation. The project manager did not have the ability to know how many participants would be present. Knowing that there are fewer perioperative staff at this facility, the project manager anticipated that there would be five to ten participants. Nevertheless, 12 participants came to the DNP project implementation.

While conflict management was a difficult topic to master, the project manager felt that she learned to control conflict appropriately through the project process. Learning to be flexible, anticipating change, and creating alternative action plans were all experienced. The COVID-19 pandemic was a conflict in many respects. Even so, the project manager felt that if the pandemic had not occurred, the normal activity of the OR staff may have not afforded the availability of the 12 staff members that participated.

## **Chapter 6: Discussion**

### **Impact of Project**

The Stanford Cognitive Aid group diligently invested their time and attention into creating a safety tool that has the potential to benefit every perioperative setting. Through the creation of the QI project, the project manager learned how very few people are aware of the Manual. When having the Manuals printed at a local printing company, the clerk was interested in the purpose of the Manuals. When the project manager relayed the reason to access the

cognitive aid, she explained how surprised she was that every OR does not currently have the Manuals.

The project manager desired to leave an effective tool for the perioperative staff at Parkview Noble Hospital. After the project was implemented on January 12, 2021 several staff stayed behind to ask further questions about the Stanford Manual. Staff inquired how the project manager discovered the Manual and expressed their gratitude for bringing this tool to the facility. Staff determined where the optimal location for the Manuals would be in order for easy, quick access. The project manager gifted four Manuals to the facility in January. The staff were thankful and stated they desired three more for the endoscopy suites and PACU. Because the project manager knew the importance of adequate crisis management, she provided an additional three manuals. Three weeks later, the project manager returned to the facility and staff communicated that the Stanford Emergency Manuals were now hanging at the entrance of each operating room.

The desire of the project manager is that the Stanford Manuals become a staple item in each OR throughout the nine Parkview Health Facilities. This Manual has the ability to guide staff through crisis management and has demonstrated that it helps to provide positive patient outcomes. Completing this QI DNP project was impactful for the project manager, as she gained the ability to educate others and make changes that could impact patients' lives for the better. In essence, the project impacted those learning about the Stanford Emergency Manual during the formation of the DNP project, Parkview Noble Hospital's perioperative staff, future patients, and the project manager.

### **Decisions and Recommendations**

Recommendations for Parkview Noble Hospital were to maintain a copy of the Stanford Emergency Manual in each OR and in the preoperative and postoperative areas. Furthermore,

scheduled simulation experiences for the perioperative staff would help make the Stanford Emergency Manuals a more frequented tool. The more the Manual is used in a safe, simulated setting, the more confident staff will become in using the Manual during a true crisis.

### **Limitations of the Project**

Limitations of the DNP project were due in part to COVID-19. The pandemic resulted in less facility preparation prior to the project implementation. Because the project manager was unable to visit the facility in the weeks preceding January 12, 2021, and since the email system throughout Parkview Health restricted outside emails from being received by Parkview Noble employees, the project manager was unable to know an exact number of participants. Had the project manager known that 12 participants would be present, she would have been able to better plan for two separate simulation experiences during the allotted QI project time. Two separate simulations would have enabled the twelve participants to be divided into two groups and provide a more individualized, hands-on experience and a more accurate representation of the SET-M survey's affect on participants' confidence level.

A second limitation due to the pandemic was that the project manager had a specified appointment time for the implementation. The project manager's assigned time slot was 1300 on January 12, 2021, for the start of the project. Therefore, she had to bring all her supplies in, set up the PowerPoint presentation in the meeting room, and prepare the simulation items in the endoscopy suite all in just minutes prior to the implementation time. In order to be able to successfully present the project in person versus virtual, the project manager relayed to the OR director that she would bring her own supplies and would keep the presentation to an hour. That re-assured the OR director that the in-person implementation could be completed despite the COVID-19 facility rules which restricted all other outside guests. The OR director knew the

importance of the in-person meeting and granted special permission for the project manager. Any more time spent preparing for the implementation took time away from the actual implementation and data collection.

### **Applications to Other Settings**

Though the Stanford Emergency Manual is used for perioperative crisis, it is applicable for other units of the hospital. It outlines advanced cardiac life support (ACLS) algorithms such as asystole, bradycardia, pulseless electrical activity, supraventricular tachycardias, and ventricular fibrillation/tachycardia. Moreover, hypotension and amniotic fluid embolism crises are contained in the manual which are applicable in the maternal unit. In essence, the Emergency Manual lists crisis that are applicable to healthcare providers throughout many fields.

### **Strategies for Maintaining and Sustaining**

Sustainability of the Emergency Manual is up to the direction of Parkview Noble Hospital. The project manager thoroughly provided the reasons that this Manual was a vital tool to increase patients' safety during the perioperative time period. The subjective responses received from the participants confirmed to the project manager that they were willing to use the Manual. Staff asked questions such as "*How do we know when an updated version is out?*", "*How did you find out about the Manuals?*", and "*Where do you think is the best place for each Manual?*". The project manager directed participants to the Stanford website to access further information, download the free Manuals, and for an updated version when Stanford Cognitive Aid group makes that available. Staff were appreciative of the Emergency Manuals gifted to Parkview Noble Hospital. Requesting of more Manuals was an indication that Parkview Noble Hospital was prepared to sustain the QI DNP project.

## Lessons Learned

Completing this DNP project was a feat that the project manager desired to do well and spent much time preparing, reading, and writing. It was important for the project manager to complete areas under each of the eight DNP Essentials in order to fulfill the requirements for the DNP project manuscript. The DNP Essentials served as a guide for the project process and the project manager met each DNP Essential.

- **Essential I- Scientific Underpinning for Practice-** was met by completing the literature review, presenting the problem statement, and presenting a new practice method for crisis management.
- **Essential II- Organization and System Leadership for Quality Improvement and Systems Thinking-** was accomplished by making a SWOT analysis, collaborating with stakeholders of Parkview Noble Hospital to influence change, and completing a practice assessment of the facility.
- **Essential III- Clinical Scholarship and Analytical Methods for Evidence-Based Practice-** was met by computing data analysis, implementing the QI project, finishing the DNP manuscript, and completing IRB documents.
- **Essential IV- Information Systems/Technology and Patient Care Technology for Improvement and Transformation of Health Care-** was achieved by completing training of data activities from data sets and participating as team leader in the guidance of the Stanford Emergency Manual website for Parkview Noble Hospital.
- **Essential V- Health Care Policy for Advocacy in Health Care-** was completed by critiquing peers' policy and their respective DNP projects.
- **Essential VI- Interprofessional Collaboration for Improving Patient and Population Outcomes-** was accomplished by meeting with the project advisor, mentors, and DNP

teammates throughout the project process, collaborating with a librarian, and communicating with Parkview Noble Hospital's leadership.

- **Essential VII- Clinical Prevention and Population Health for Improving the Nation's Health-** was met through the project implementation planning of the individual roles of crisis management for Parkview Noble Hospital's simulation experience.
- **Essential VIII- Advanced Nursing Practice-** was reached by disseminating the crisis knowledge to healthcare professionals, implementation of the project at Parkview Noble Hospital, and mentoring second year SRNAs at the University of Saint Francis on the DNP project process.

Though the DNP project implementation did not go as the project manager had originally planned, the project manager left Parkview Noble Hospital on implementation day with more test packets completed than she had anticipated. Although a global pandemic changed the implementation day schedule, communication was difficult via email, preparation before implementation was not allowed, and fewer staff were employed at Parkview Noble Hospital than other facilities, the project manager had more than twice the number of voluntary participants than she believed would attend. By demonstrating a sincere passion for a QI project and believing in the positive patient outcomes that Parkview Noble Hospital could experience due to the implementation of the Stanford Emergency Manual, the project manager met her desired aims for the QI project. Through the project process, the project manager learned how to be a quality interprofessional communicator, exhibit transformational leadership traits, persistently communicate despite difficulties, stay flexible when plans change, and demonstrate understanding when a pandemic causes undue stress for a facility and staff.

## **Chapter 7: Conclusion**

### **Potential Project Impact on Health Outcomes Beyond Implementation Site**

The DNP project, *Stanford Emergency Manual Use During Operating Room Crises* has the potential to positively impact outcomes for patients and staff in any perioperative setting. Cognitive aids allow healthcare professionals to have information readily available to aid in crisis management, enabling the adherence to evidenced-based practice and correct patient medical management. Any perioperative setting would benefit from having the Stanford Emergency Manual as their cognitive aid for perioperative crises as extensive time, simulation, and research were invested into the creation of the Manual by the Stanford Anesthesia Cognitive Aid Group (Goldhaber-Fiebert, Pollock, Howard, and Bereknyei Merrell, 2016). Furthermore, it has proved to be helpful in guiding crisis management in major medical centers such as Stanford Health Care and Massachusetts General Hospital.

In addition to having information at one's fingertips with a cognitive aid, such tools aid in streamlined, evidenced-based practice, in the medical management of a stressful crisis. Stress increases the chance of making critical errors, and amidst a stressful situation, people are unable to efficiently remember learned critical information (Goldhaber-Fiebert, Pollock, Howard, and Bereknyei Merrell, 2016). Errors of omission, either from stress or lack of knowledge, have been noted in the literature when a cognitive aid is not used. Positive health outcomes have resulted from the Emergency Manual incorporation into perioperative settings. Every perioperative setting would benefit from the Emergency Manual as stress is lessened with the ease of access to critical information algorithms.

### **Health Policy Implications of Project**

The World Health Organization (WHO) describes health policy as the decisions, plans, and actions completed to reach specific health care goals (University of North Dakota, 2021).

Currently, there is not a formal health policy regarding the Stanford Emergency Manual. However, there are standards set forth by the American Association of Nurse Anesthetists (AANA) by which Certified Registered Nurse Anesthetists (CRNAs) must abide. Standard 14 details the necessity of a safe culture, communication, and interdisciplinary engagement (AANA, 2019). Knowing that a cognitive aid is a tool that promotes patient safety, team communication, and cooperation through simulation experiences, CRNAs would be wise to incorporate the Manual into their arsenal of tools to promote the AANA Standard 14.

### **Proposed Future Direction for Practice**

When a crisis occurs in the perioperative setting, staff must possess correct crisis knowledge, situational awareness, and teamwork in order to optimize patient safety (Calder et al., 2017). The literature exemplifies that stress causes healthcare professionals to forget learned crisis knowledge, potentially resulting in patient harm (Kuhlmann et al., 2005). The Stanford Emergency Manual is a cognitive aid that has the potential to standardize crisis management, reduce knowledge errors, and improve correct crisis management (Goldhaber-Fiebert & Howard, 2013). This DNP project has demonstrated that the Stanford Emergency Manual is a tool that can be quickly accessed by the perioperative staff members during a crisis and will improve their ability and confidence to manage the crisis effectively and efficiently.

As healthcare providers, patient safety ought to be at the forefront. Cognitive aids, emergency manuals, or checklists serve to keep patients safe when their lives are placed in the midst of the healthcare system. This DNP project was implemented in order to encourage Parkview Noble Hospital to acquire and use the free Emergency Manual designed by the Stanford Anesthesia Cognitive Aid Group. The Emergency Manual has been a cognitive aid that users have greatly valued as evidenced by the fact that since its creation in 2012, the Stanford Emergency Manual has been downloaded in excess of 20,000 times according to Goldhaber-

Fiebert, Pollock, Howard, and Bereknyei Merrell (2016). As more staff become familiar with the Emergency Manual, utilize the Manual in simulations, and access the Manual as a learning device, the future care of crises management can result in positive outcomes-both for patients and health care professionals.

Parkview Noble Hospital now has crisis management knowledge, the Stanford Emergency Manual, and increased confidence to educate and influence the Parkview Health community and communities alike. The project manager desires that the future of perioperative care for Parkview Noble Hospital, and other hospitals, will be distinguished by the knowledge of crisis management outlined above and a future that maintains the Stanford Emergency Manual in each perioperative setting.

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## Appendices

### Appendix A: Simulation Completion Certificate



## **Appendix B: Informed Consent**

### **INFORMED CONSENT FORM**

#### **STANFORD EMERGENCY MANUAL USE DURING OPERATING ROOM CRISES**

##### **Introduction of the Quality Improvement Project:**

My name is Amanda Huff BSN, RN, USF DNP-NAP student from the University of Saint Francis. As part of my Doctoral of Nursing Practice (DNP) education, I am doing a quality improvement (QI) project to improve operating room (OR) and perioperative staff members' knowledge of the Stanford Emergency Manual and to improve staffs' confidence in crisis management. I, along with my DNP project advisor, Dr. Mary Spath, would be grateful if you would participate in this QI project. Your participation would greatly help in implementing the Stanford Emergency Manual into each OR at Parkview Noble Hospital. This cognitive aid will be an adjunct to patient safety during a crisis.

##### **Procedures:**

- Participants will be asked to complete this informed consent, a demographic data form, a pre-test and a pre-survey called the Simulation Effectiveness Tool-Modified (SET-M), prior to the introduction of the Stanford Emergency Manual. This will take approximately 10 minutes.
- A PowerPoint presentation lasting approximately 15-20 minutes will be then given, highlighting crisis management and the importance of utilizing the Stanford Emergency Manual.
- Following the presentation, each participant will be asked to participate (in their professional role) in an approximately 20-minute simulation of a malignant hyperthermia crisis. This simulation will occur in a designated OR at Parkview Noble Hospital.
- After the simulation there will be a period of debriefing that will take 15 minutes. The post-test and the SET-M survey will then be given for staff members to fill out at the conclusion of the QI project.
- Your total participation will take approximately one hour.

##### **Risks of the Quality Improvement Project:**

- During the pre and post survey, there may be hesitation in answering questions regarding confidence during crisis management. Your results will not be shared with anyone and each survey will be kept anonymous.
- There is a risk of accidental needle stick during the preparation of simulated medication preparation. If this occurs, staff will be directed to follow Parkview's protocol on needlestick injury.
- During debriefing, there is a risk of feeling vulnerable while sharing your thoughts of the simulation and your thoughts on personal confidence.

- This will be a simulated environment, utilizing a mannequin, and no risk to a patient will occur.
- During debriefing, audio recording will occur in order to gather aggregate data for survey support. Audio recording will not display any participant identifying information.
- There is no compensation for participating in the QI project.

**Benefits of the Quality Improvement Project:**

- You will be gaining an understanding of how to properly use the Stanford Emergency Manual during an operating room crisis and the importance of not relying solely on memory to complete tasks.
- You will gain further knowledge on a crisis management strategy specifically for malignant hyperthermia.
- Each staff member will have the potential to gain increased confidence during crisis management.

**Safeguards:**

- Confidentiality will be maintained. There will not be personal identification on surveys collected (e.g. name or date of birth).
- The audio recorded debriefing session will be confidential as no identifying information will be mentioned on the audio recording. Only the project manager will have access to the recording.
- The data collected will be shared under the results section and as part of the completion of the project. However, no personal identifying information will be presented.
- The forms and surveys collected will be stored in a locked filing cabinet.
- The anonymous results of the QI project will be given to Parkview Noble Hospital's OR director, anesthesia director, and the University of Saint Francis when the project is completed.
- Data that is published will be as the totality of the project.

**Withdraw Freedom:**

At any point of participation in the QI project, any staff member may freely withdraw without punitive action. Participation is 100% voluntary and those who opt out will do so without any worry of a penalty. If a staff member desires to withdraw mid-way through the QI project, then any partially completed information will be placed in the shred box. If any health care student is participating, withdrawing from the QI project will not influence any part of that student's grade.

**Questions?**

After the QI project is completed, I would be pleased to present the findings of this project to the staff members at Parkview Nobel Hospital. However, if any questions arise prior to completion, I can be contacted at:

Amanda Huff  
 8011 King Road  
 Plymouth, IN 46563  
 Phone: (574) 520-2434  
 Email: [snyderam1@cougars.sf.edu](mailto:snyderam1@cougars.sf.edu)

If any complaints arise as a participant in the QI project, please contact:

IRB Chairperson  
University of Saint Francis  
2701 Spring Street  
Fort Wayne, IN 46808  
(260) 399-7700  
Administration Email: [irb@sf.edu](mailto:irb@sf.edu)

**I have received an explanation of this QI project and agree to participate. I understand that my participation in this QI project is strictly voluntary.**

**Name** \_\_\_\_\_ **Date** \_\_\_\_\_

**This research project has been approved by the University of Saint Francis' Institutional Review Board for the Protection of Human Subjects for a one-year period.**

## Appendix C: SET-M Tool

### Simulation Effectiveness Tool - Modified (SET--M)

After completing a simulated clinical experience, please respond to the following statements by circling your response.

| <b>PREBRIEFING:</b>  | <b>Strongly Agree</b> | <b>Somewhat Agree</b> | <b>Do Not Agree</b> |
|--|-----------------------|-----------------------|---------------------|
| Prebriefing increased my confidence.   | 3                     | 2                     | 1                   |
| Prebriefing was beneficial to my learning.   | 3                     | 2                     | 1                   |
| <b>SCENARIO:</b>   |                       |                       |                     |
| I am better prepared to respond to changes in my patient's condition.                          | 3                     | 2                     | 1                   |
| I developed a better understanding of the pathophysiology.                                     | 3                     | 2                     | 1                   |
| I am more confident of my assessment skills.   | 3                     | 2                     | 1                   |
| I felt empowered to make clinical decisions.   | 3                     | 2                     | 1                   |
| I developed a better understanding of medications (Leave blank if no medications in scenario). | 3                     | 2                     | 1                   |
| I had the opportunity to practice my clinical decision-making skills.                          | 3                     | 2                     | 1                   |
| I am more confident in my ability to prioritize care and interventions.                        | 3                     | 2                     | 1                   |
| I am more confident in communicating with my patient.  | 3                     | 2                     | 1                   |
| I am more confident in my ability to teach patients about their illness and interventions.     | 3                     | 2                     | 1                   |
| I am more confident in my ability to report information to health care team.                   | 3                     | 2                     | 1                   |
| I am more confident in providing interventions that foster patient safety.                     | 3                     | 2                     | 1                   |
| I am more confident in using evidence-based practice to provide care.                          | 3                     | 2                     | 1                   |
| <b>DEBRIEFING:</b>   |                       |                       |                     |
| Debriefing contributed to my learning.   | 3                     | 2                     | 1                   |
| Debriefing allowed me to verbalize my feelings before focusing on the scenario.                | 3                     | 2                     | 1                   |
| Debriefing was valuable in helping me improve my clinical judgment.                            | 3                     | 2                     | 1                   |
| Debriefing provided opportunities to self-reflect on my performance during simulation.         | 3                     | 2                     | 1                   |
| Debriefing was a constructive evaluation of the simulation.                                    | 3                     | 2                     | 1                   |
| What else would you like to say about today's simulated clinical experience?                   |                       |                       |                     |

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Contact: Kim Leighton: kleighton@devry.edu; 402---617---1401

## Appendix D: Demographic Questionnaire

### Demographic Questionnaire

**Directions:** Please answer each question by filling in the space provided.

1. What is your gender?  
\_\_\_\_\_ Male          \_\_\_\_\_ Female
2. How old are you?  
\_\_\_\_\_ Years
3. What is your professional role? *Please fill in the circle.*
  - Surgeon
  - Anesthesiologist
  - Certified Registered Nurse Anesthetist (CRNA)
  - Registered Nurse (RN)
  - Licensed Practical Nurse (LPN)
  - Surgical Technologist
  - Operating Room Assistant (ORA)
  - Anesthesia Technician
  - Student
  - Other
4. How many years of service do you have in the above-mentioned professional role?  
\_\_\_\_\_ Years
5. Have you participated in simulation training before?  
\_\_\_\_\_ Yes          \_\_\_\_\_ No
6. Have you participated in teamwork training before?  
\_\_\_\_\_ Yes          \_\_\_\_\_ No
7. Have you ever participated in a malignant hyperthermia crisis?  
\_\_\_\_\_ Yes (*If yes, please also fill in the circle below that applies to you.*)
  - Real Crisis.
  - Simulated Crisis\_\_\_\_\_ No

### Appendix E: Pre-Test

**Directions:** Please circle the letter that corresponds to the correct answer. Only **one** answer is correct for each question.

1. When a patient is suspected of having malignant hyperthermia (MH), what is the recommended Dantrolene dose to administer?
  - a. 25 mg/kg
  - b. 15 mg/kg
  - c. 2.5 mg/kg
  - d. 1.5 mg/kg
  
2. During an episode of MH, what do you mix Dantrolene with?
  - a. Sterile water
  - b. Normal Saline
  - c. Lactated Ringer
  - d. Any of the above
  
3. You are assisting with a peripheral nerve block in the operating room or pre-operative unit. The anesthesia provider believes the patient is experiencing a local anesthetic systemic toxicity (LAST) event. The patient has a sustained heart rate of 65. What is the first treatment of choice?
  - a. Epinephrine
  - b. Ephedrine
  - c. Normal Saline
  - d. Intralipids
  
4. The anesthesia provider suspects that that patient has a pneumothorax. The patient is now hemodynamically unstable. What is the next course of action you anticipate?
  - a. Place a 12- or 14-gauge needle mid axillary line 4<sup>th</sup> intercostal space on affected side
  - b. Place 14- or 16-gauge needle mid clavicular line 2<sup>nd</sup> intercostal space on affected side
  - c. The patient will be sent for a chest x-ray
  - d. Both A and C
  
5. During surgery, the patient goes into supraventricular tachycardia and is unstable. What should be done next?
  - a. Immediate synchronized cardioversion
  - b. The patient should receive atropine 0.4 mg
  - c. Give magnesium sulfate 2 g
  - d. All of the above

## Reference

Stanford Anesthesia Cognitive Aid Group. (2016). *Emergency manual: Cognitive aids for perioperative critical events*.

[http://web.stanford.edu/dept/anesthesia/em/semv3.1\\_digital.pdf?\\_ga=2.219553945.1406350378.1501440567-576169366.1501440567](http://web.stanford.edu/dept/anesthesia/em/semv3.1_digital.pdf?_ga=2.219553945.1406350378.1501440567-576169366.1501440567)

## Appendix F: Post-Test

**Directions:** Please circle the letter that corresponds to the correct answer. Only **one** answer is correct for each question.

1. When a patient is suspected of having malignant hyperthermia (MH), what is the recommended Dantrolene dose to administer?
  - a. 25 mg/kg
  - b. 15 mg/kg
  - c. 2.5 mg/kg
  - d. 1.5 mg/kg
  
2. During an episode of MH, what do you mix Dantrolene with?
  - a. Sterile water
  - b. Normal Saline
  - c. Lactated Ringer
  - d. Any of the above
  
3. You are assisting with a peripheral nerve block in the operating room or pre-operative unit. The anesthesia provider believes the patient is experiencing a local anesthetic systemic toxicity (LAST) event. The patient has a sustained heart rate of 65. What is the first treatment of choice?
  - a. Epinephrine
  - b. Ephedrine
  - c. Normal Saline
  - d. Intralipids
  
4. The anesthesia provider suspects that that patient has a pneumothorax. The patient is now hemodynamically unstable. What is the next course of action you anticipate?
  - a. Place a 12- or 14-gauge needle mid axillary line 4<sup>th</sup> intercostal space on affected side
  - b. Place 14- or 16-gauge needle mid clavicular line 2<sup>nd</sup> intercostal space on affected side
  - c. The patient will be sent for a chest x-ray
  - d. Both A and C
  
5. During surgery, the patient goes into supraventricular tachycardia and is unstable. What should be done next?
  - a. Immediate synchronized cardioversion
  - b. The patient should receive atropine 0.4 mg
  - c. Give magnesium sulfate 2 g
  - d. All of the above

**Directions:** Please place an X on the answer that applies to you.

1. Did you complete the PowerPoint Presentation?  
\_\_\_\_\_ Yes                      \_\_\_\_\_ No
2. Did you complete the MH simulation?  
\_\_\_\_\_ Yes                      \_\_\_\_\_ No
3. Did you use/access the Emergency Manual on this post-test?  
\_\_\_\_\_ Yes                      \_\_\_\_\_ No
4. Did you use or abide by the Emergency Manual during the simulation (e.g. complete a task assigned to you by leader/reader)?  
\_\_\_\_\_ Yes                      \_\_\_\_\_ No
5. Did you find the Emergency Manual helpful on the post-test?  
\_\_\_\_\_ Yes                      \_\_\_\_\_ No
6. How likely are you to use the Emergency Manual when faced with a perioperative crisis?  
\_\_\_\_\_ Very likely              \_\_\_\_\_ Somewhat likely              \_\_\_\_\_ Not very likely

## Reference

Stanford Anesthesia Cognitive Aid Group. (2016). *Emergency manual: Cognitive aids for perioperative critical events*.

[http://web.stanford.edu/dept/anesthesia/em/semv3.1\\_digital.pdf?\\_ga=2.219553945.1406350378.1501440567-576169366.1501440567](http://web.stanford.edu/dept/anesthesia/em/semv3.1_digital.pdf?_ga=2.219553945.1406350378.1501440567-576169366.1501440567)

## Appendix G: SWOT Analysis

### Strengths

- Patient centered Staff
- Network leadership that encourages innovation
- Patients committed to Parkview Noble Hospital
- Favorable environment for learning and students
- Small, community feel
- Access to Mirro Center for further simulation practice
- Support of stakeholders
- Interprofessional collaboration present
- Community owned
- New nursing staff anxious to learn

### Weaknesses

- Absence of standardized crisis management
- New, less experienced nursing staff
- Less perioperative staff than a large facility has in order to help the QI project be sustained
- Fewer crises thus far causing the innovation to not be used as regularly as a large teaching hospital
- Less providers aware of cognitive aids and the importance of the use
- Three operating rooms which all may be in use the day of implementation
- Small number of staff

### Opportunities

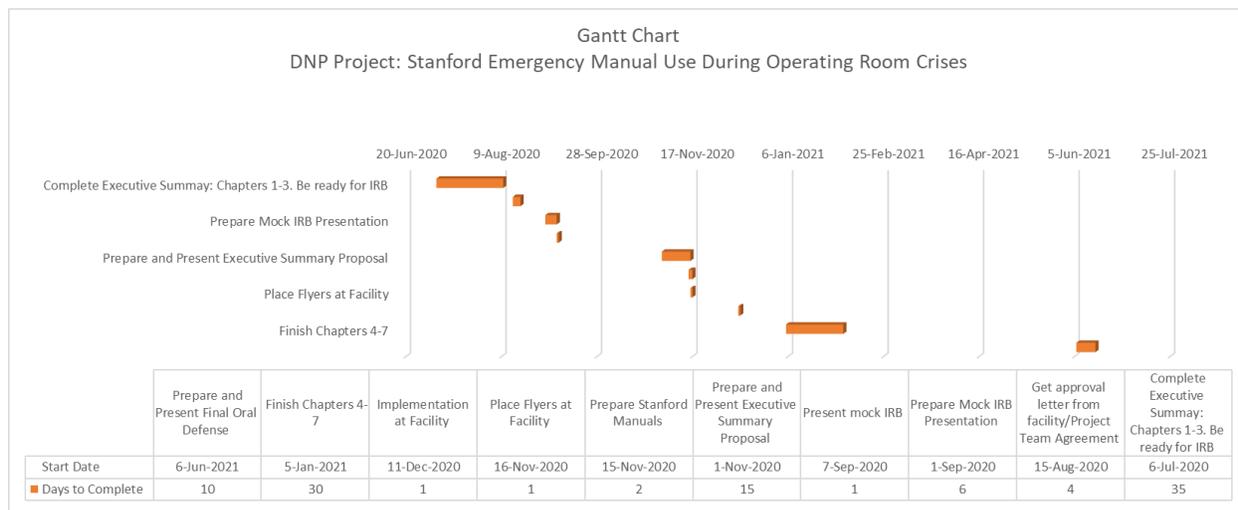
- Mirro Center for Innovation is a community leader in research and innovation
- Staff that are highly engaged with patient care
- High potential to be an influencer for the whole Parkview Health network
- Students who partake in clinical experience can help innovation occur at Parkview Noble Hospital
- Free Emergency Manual innovation may lead to other innovative projects
- Experienced anesthesia director who is familiar with the Stanford Emergency Manual
- OR director who was eager and excited about innovation and the QI project

### Threats

- Large demands on OR director causing a lack of communication back to the DNP student
- Unforeseen busy OR day on the implementation day causing a change to the project simulation setting
- Staff that do not feel the implementation day is necessary to attend
- Covid-19 facility standards do not allow for project education session and simulation
- Simulation supervisor is unable to attend the simulation day
- Resistance from the OR director with the implementation plan
- Staff unable to attend due to sickness or staffing shortages

## Appendix H: Gantt Chart

| Task   | Start Date  | Days to Complete |
|--|-------------|------------------|
| Complete Executive Summary: Chapters 1-3. Be ready for IRB | 6-Jul-2020  | 35               |
| Get approval letter from facility/Project Team Agreement   | 15-Aug-2020 | 4                |
| Prepare Mock IRB Presentation                              | 1-Sep-2020  | 6                |
| Present mock IRB   | 7-Sep-2020  | 1                |
| Prepare and Present Executive Summary Proposal             | 1-Nov-2020  | 15               |
| Prepare Stanford Manuals                                   | 15-Nov-2020 | 2                |
| Place Flyers at Facility                                   | 16-Nov-2020 | 1                |
| Implementation at Facility                                 | 11-Dec-2020 | 1                |
| Finish Chapters 4-7  | 5-Jan-2021  | 30               |
| Prepare and Present Final Oral Defense                     | 6-Jun-2021  | 10               |



**Appendix I: Parkview Noble Hospital Support Letter**

August 18, 2020

To the University of Saint Francis Institutional Review Board:

This letter is being written in support of the University of Saint Francis NAP/DNP Amanda Huff's Doctor of Nursing Practice Scholarly Project entitled Stanford Emergency Manual Use During Operating Room Crises. Parkview Noble Hospital understands that the aims of the DNP Scholarly Project are to provide an overview on crisis management and the importance of utilizing the Stanford Emergency Manual by way of a PowerPoint presentation and a crisis simulation.

Parkview Noble Hospital is supportive of the aims of the project. This facility's role in the DNP project is allowing the DNP project manager to provide staff with documents and surveys related to the DNP project, a PowerPoint presentation, and a crisis simulation. Furthermore, Parkview Noble Hospital does not require this DNP project to go through Parkview's IRB.

Parkview Noble Hospital and the perioperative leadership is committed to Amanda Huff's DNP Scholarly Project: Stanford Emergency Manual Use During Operating Room Crises.

Sincerely,

*Heather Antal, MSN, RN, CNOR*

Manager of Perioperative Services & FBC  
Parkview Noble Hospital  
260-347-8372

## Appendix J: CITI Training Certificates





Completion Date 31-Jan-2020  
 Expiration Date 30-Jan-2023  
 Record ID 34924055

This is to certify that:

**Amanda Huff**

Has completed the following CITI Program course:

**Public Health Research** (Curriculum Group)  
**Public Health Research** (Course Learner Group)  
**1 - Basic** (Stage)

Under requirements set by:

**University of Saint Francis**



Verify at [www.citiprogram.org/verify/?w4c124b62-b24f-494d-bb45-581470a4bfc2-34924055](http://www.citiprogram.org/verify/?w4c124b62-b24f-494d-bb45-581470a4bfc2-34924055)





Completion Date 01-Feb-2020  
 Expiration Date 31-Jan-2023  
 Record ID 34924051

This is to certify that:

**Amanda Huff**

Has completed the following CITI Program course:

**Social & Behavioral Research - Basic/Refresher** (Curriculum Group)  
**Social & Behavioral Research** (Course Learner Group)  
**1 - Basic Course** (Stage)

Under requirements set by:

**University of Saint Francis**



Verify at [www.citiprogram.org/verify/?wcd1e3c8b-e8ea-4e04-94fd-b5128d2c916b-34924051](http://www.citiprogram.org/verify/?wcd1e3c8b-e8ea-4e04-94fd-b5128d2c916b-34924051)

Completion Date 01-Feb-2020  
Expiration Date N/A  
Record ID 34924052

This is to certify that:

**Amanda Huff**

Has completed the following CITI Program course:

**Information Privacy Security (IPS)** (Curriculum Group)  
**Researchers** (Course Learner Group)  
**1 - Basic Course** (Stage)

Under requirements set by:

**University of Saint Francis**



Verify at [www.citiprogram.org/verify/?w5fed60ae-5c27-4c2f-9d6c-78dfdea5a8bf-34924052](http://www.citiprogram.org/verify/?w5fed60ae-5c27-4c2f-9d6c-78dfdea5a8bf-34924052)

Completion Date 30-Jan-2020  
Expiration Date 29-Jan-2023  
Record ID 34924054

This is to certify that:

**Amanda Huff**

Has completed the following CITI Program course:

**GCP – Social and Behavioral Research Best Practices for Clinical Research** (Curriculum Group)  
**GCP – Social and Behavioral Research Best Practices for Clinical Research** (Course Learner Group)  
**1 - Basic Course** (Stage)

Under requirements set by:

**University of Saint Francis**



Verify at [www.citiprogram.org/verify/?we5b1fd00-b469-4ed7-a5ef-e1271f9c61cb-34924054](http://www.citiprogram.org/verify/?we5b1fd00-b469-4ed7-a5ef-e1271f9c61cb-34924054)

Completion Date 17-Mar-2020  
Expiration Date 17-Mar-2023  
Record ID 34924053

This is to certify that:

**Amanda Huff**

Has completed the following CITI Program course:

**Social and Behavioral Responsible Conduct of Research** (Curriculum Group)  
**Social and Behavioral Responsible Conduct of Research** (Course Learner Group)  
**1 - RCR** (Stage)

Under requirements set by:

**University of Saint Francis**



Verify at [www.citiprogram.org/verify/?w027c2a17-4c54-4044-9128-67f7222fb935-34924053](http://www.citiprogram.org/verify/?w027c2a17-4c54-4044-9128-67f7222fb935-34924053)

## **Appendix K: Learning Objectives**

### **Learning Objectives for PowerPoint Presentation**

By the end of the PowerPoint presentation: participants will understand:

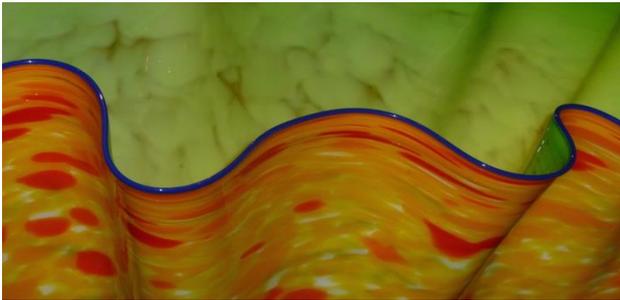
- The background of cognitive aids and the importance of the use during a crisis
- Review landmark studies
- The importance of the Stanford Emergency Manual

### **Learning Objectives for Crisis Simulation**

By the end of the simulation experience, participants will be able to:

- Request for the Emergency Manual to be read from to guide the MH crisis
- Demonstrate appropriate communication with members of the team and assign roles for crisis management
- Use the Emergency Manual as a guide for MH management and complete critical steps in a timely manner

## Appendix L: Permission Letter



# Evaluating Healthcare Simulation

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April 29, 2020

Dear Amanda

The authors of the Simulation Effectiveness Tool - Modified (SET-M) are pleased to grant permission for you to use this instrument in your DNP project for “Cognitive Aid Use in Operating Room Crisis.” We look forward to learning about the outcomes of your work.

Please don't hesitate to reach out with any questions.

Warm regards,

Kim

Kim Leighton, PhD, RN, CHSE, CHSOS, ANEF, FAAN  
[huskern@gmail.com](mailto:huskern@gmail.com)

## Appendix M: Data Analysis Plan

**Part 1: Overall Project Purpose Statement:** The purpose of this quality improvement project is to increase knowledge on crisis management utilizing the Stanford Emergency Manual and to increase perioperative staff members' confidence when faced with a perioperative crisis.

**Describe the denominators in which you will be measuring your outcomes:**

Population of People: Perioperative staff members

- 1) Perioperative nurses- Parkview Noble Hospital is a small rural hospital. Therefore, many preoperative, operating room, and post-anesthesia care unit nurses cross train for all three locations. Therefore, perioperative nurses will be measured.
- 2) Anesthesia staff members, operating room assistants (ORAs), surgical technicians, medical/nursing students in clinical at the time will also be measured as part of the perioperative staff.
- 3) In these staff members increased knowledge (demonstrated by increased number on correct answers on post-test versus pre-test) and confidence (on pre- SET-M versus post-SET-M surveys) will be measured to see if either/both increased after the QI project is completed.

Events: Crisis management via a PowerPoint presentation and a simulation experience.

- 1) PowerPoint presentation on crisis management and the importance of the Stanford Emergency Manual usage
- 2) Simulation of a malignant hyperthermia crisis and using the Emergency Manual to guide the crisis management.

*For sections 2a (Population Description Table) and 3a (Event Description Table) use one or both as it fits what you will be measuring in your DNP project*

**Part 2a: Population Description Table:**

| (Fill in the required information in the right column) |  |
|--|--|
| Name of the Population                                 | Perioperative Staff Members  |
| Aims and Outcomes Measured in this population          | <p><b>Aim 1:</b> Increase staff members knowledge of correct usage of the Stanford Emergency Manual for crisis management.</p> <p><b>Outcome/Indicator 1a:</b> Perioperative staff members will have increased knowledge of the Stanford Emergency Manual as evidenced by a 20% increase in correct answers on post-test compared to the pre-test.</p> <p><b>Measure 1a:</b> Pre-test/post-test</p> <p><b>Outcome/Indicator 1b:</b> Thirty percent of staff will recognize the importance of accessing the Manual when unsure of a critical step during crisis management as evidenced by Manual use on the post-test and/or during the simulation.</p> <p><b>Measure 1b:</b> Pre-test/post-test</p> |

|   |   |
|---|---|
|   | <p><b>Aim 2:</b> Increase staff's confidence in managing the simulated crisis.</p> <p><b>Outcome/Indicator 2a:</b> The "scenario" score section on the SET-M tool will show an increase in confidence from the pre-SET-M scores to the post-SET-M scores.</p> <p><b>Measure 2a:</b> SET-M</p> <p><b>Outcome/Indicator 2b:</b> Twenty percent of total "prebriefing" SET-M scores reflected increased confidence when prebriefing occurred.</p> <p><b>Measure 2b:</b> SET-M</p> <p><b>Aim 3:</b> Debriefing is a valuable component to the PowerPoint and malignant hyperthermia simulation (done at the conclusion of the quality improvement (QI) project)</p> <p><b>Outcome/Indicator 3a:</b> Thirty percent of scores reflected "somewhat agree" (see SET-M tool) in that debriefing was a valuable part of the QI project.</p> <p><b>Measure 3a:</b> SET-M</p> <p><b>Outcome/Indicator 3b:</b> Twenty percent of SET-M scores reflected "strongly agree" (see SET-M tool) in that debriefing was a valuable part of the QI project.</p> <p>Aim 1, outcomes 1a and 1b<br/>Aim 2, outcomes 2a and 2b<br/>Aim 3, outcomes 3a and 3b</p> <p>(I included "measures" here to help organize my thoughts)</p> |
| Measures applied in this population                       | Pre-test/post-test and SET-M (See Part 4)   |
| What is the intervention?                                 | Conduct an educational intervention (PowerPoint and simulation) to <i>increase perioperative staff's knowledge</i> on crisis management using the Stanford Emergency Manual and <i>increase their confidence</i> when faced with a crisis.  |
| Group receiving intervention                              | Perioperative staff at Parkview Noble Hospital: Anesthesia staff, nurses, ORAs, surgical techs, and medical/nursing students in clinical at the time.   |
| N   | 8 (goal at minimum)   |
| Criteria for inclusion                                    | All perioperative staff   |
| Criteria for exclusion                                    | Staff who do not work in either the preoperative, operative, or post anesthesia care unit (PACU).   |
| Demographic Variables you will collect on this population | Gender, age, professional background, years in professional background, past participation in simulation training, past participation in teamwork training, past participation in malignant hyperthermia training.  |
| Timeframe for measurement                                 | December 2020 (as soon as IRB approval). Intervention will be completed in one day and measurements collected that day.   |
| Group used for comparison to intervention group           | Yes; but same group. Preintervention and postintervention compared against each other.  |

|   |  |
|---|--|
| Same group as intervention? (i.e. pre/post design?)       | <i>This may not be needed if you are using the same group (pre and post-intervention. If so, do not fill in the next set of items)</i> |
| N   |  |
| Criteria for inclusion                                    |  |
| Criteria for exclusion                                    |  |
| Demographic Variables you will collect on this population |  |
| Timeframe for measurement                                 |  |

**Part 2b: Demographic Variables:** List all the variables below you plan to use when examining your sample.

| Variable  | Brief Description   | Data Source<br>Provide name of questionnaire, instrument, log sheet, etc. | Possible Range of Values  | Level of Measurement    | Timeframe for Collection                           |
|---|---|---|---|-------------------------|--|
| Gender  | Male or female  | Demographic questionnaire   | 0= Male<br>1= Female  | Nominal:<br>Dichotomous | Implementation day.<br>Prior to PowerPoint session |
| Age   | Age in years  | Demographic questionnaire   | 17-80 years.  | Continuous: Ratio       | Implementation day.<br>Prior to PowerPoint session |
| Professional Role                                       | <ul style="list-style-type: none"> <li>• Surgeon</li> <li>• Anesthesiologist</li> <li>• Certified Registered Nurse Anesthetist (CRNA)</li> <li>• Registered Nurse (RN)</li> <li>• Licensed Practical Nurse (LPN)</li> <li>• Surgical Technologist</li> <li>• Operating Room Assistant (ORA)</li> <li>• Anesthesia Technician</li> <li>• Student</li> <li>• Other</li> </ul> | Demographic questionnaire   | 0= Surgeon<br>1= Anesthesiologist<br>2= Certified Registered Nurse Anesthetist (CRNA)<br>3= Registered Nurse (RN)<br>4= Licensed Practical Nurse (LPN)<br>5= Surgical Technologist<br>6= Operating Room Assistant (ORA)<br>7= Anesthesia Technician<br>8= Student<br>9= Other | Nominal                 | Implementation day.<br>Prior to PowerPoint session |
| Years of service in professional role                   | Years of service in professional role (as designated in question #3)  | Demographic questionnaire   | 0.002778- 60 years  | Continuous: Ration      | Implementation day.<br>Prior to PowerPoint session |
| Past participation in simulation training               | Yes or no   | Demographic questionnaire   | 0= No<br>1= Yes   | Nominal:<br>Dichotomous | Implementation day.<br>Prior to PowerPoint session |
| Past participation in teamwork training                 | Yes or no   | Demographic questionnaire   | 0= No<br>1= Yes   | Nominal:<br>Dichotomous | Implementation day.<br>Prior to PowerPoint session |
| Past participation in malignant hyperthermia simulation | Yes (if so was it real or simulated) or No  | Demographic questionnaire   | 0= No<br>1= Yes   | Nominal:<br>Dichotomous | Implementation day.<br>Prior to PowerPoint session |

**Part 3a: Events Description Table:**

| (Fill in the required information in the right column)   |   |
|--|---|
| Name of the Events in which you will measure your outcomes   | Crisis management at Parkview Noble Hospital via introduction of the Stanford Emergency Manual via PowerPoint presentation and simulation (malignant hyperthermia).   |
| Aims and Outcomes Measured in this population  | <p><b>Aim 4:</b> Provide PowerPoint presentation and a simulation (malignant hyperthermia) on crisis management using the Stanford Emergency Manual.</p> <p><b>Outcome/Indicator 4a:</b> At least 8 perioperative staff members will attend PowerPoint educational intervention.</p> <p><b>Measure 4a:</b> Demographic data form filled out as attendance roster</p> <p><b>Outcome/Indicator 4b:</b> At least 8 perioperative staff members will attend simulation intervention (the same staff members that attended the PowerPoint intervention).</p> <p><b>Measure 4b:</b> Demographic data form filled out as attendance roster</p> <p>Aim 4, outcomes 4a and 4b</p> <p>(I included “measures” here to help organize my thoughts)</p> |
| Measures applied to these events   | The dependent variable is the number of staff attending the PowerPoint and simulation → recorded by the demographic questionnaire which serves as attendance roster   |
| What is the intervention?  | Conduct an educational intervention (PowerPoint and simulation on malignant hyperthermia) to increase perioperative staff’s knowledge on crisis management using the Stanford Emergency Manual.   |
| Do you need to consider “populations” in the event collection? If so what do you need to collect for data? | --No--  |
| Collection of “events” receiving the intervention  | Malignant hyperthermia (MH) crisis will be simulated in the operating room environment at Parkview Noble. The staff will learn to utilize the Stanford Emergency Manual to manage the crisis.   |
| N  | 1 PowerPoint presentation for all participants. Maximum of 2 MH simulations depending on number of participants (want the group to be small enough for all participants to benefit)   |
| Criteria for inclusion   | PowerPoint presentation and MH simulation   |
| Criteria for exclusion   | No exclusion criteria   |
| Descriptive information you will collect about these events  | Number of participants in the PowerPoint presentation, number of participants in each simulation, staff who used manual during simulation and/or Post-test, length of time for the simulation(s), number of correct steps or medication dosages   |

|   |   |
|---|---|
| Timeframe for measurement                                   | December 2020 (after IRB approval). Measurements collected on QI project implementation day   |
| Group used for comparison to intervention group             | <i>This may not be needed if you are using the same group (pre and post-intervention events. If so, do not fill in the next set of items)</i> |
| N   |   |
| Criteria for inclusion                                      |   |
| Criteria for exclusion                                      |   |
| Descriptive information you will collect about these events |   |
| Timeframe for measurement                                   |   |

**Part 3b: Descriptive Variables:** List all the variables below you plan to use when examining the event(s).

| Variable  | Brief Description   | Data Source<br>Provide name of questionnaire, instrument, log sheet, etc.   | Possible Range of Values | Level of Measurement | Timeframe for Collection |
|---|---|---|--------------------------|----------------------|--------------------------|
| Participants in PowerPoint presentation                 | Number of perioperative staff present                             | Demographic questionnaire serves as log sheet   | 0-20                     | Ratio                | Implementation day       |
| Participants in Simulation                              | Number of perioperative staff present                             | Demographic questionnaire serves as log sheet   | 0-20                     | Ratio                | Implementation day       |
| Staff who utilize the Stanford Manual during Post-test  | Number of perioperative staff who used of Manual during post-test | Post-test (will have box to check: "I used the manual during this test")  | 0-20                     | Ratio                | Implementation day       |
| Staff who utilize the Stanford Manual during simulation | Number of perioperative staff who used Manual during post-test    | Post-test (will have box to check: "I used the manual/listened for steps read from the Manual during simulation") | 0-20                     | Ratio                | Implementation day       |
| Length of time for the simulation                       | Time in minutes   | Simulation-recording  | 1-60                     | Ratio                | Implementation day       |
| Number of correct steps and/or medication doses         | Number of correct steps followed on the manual                    | Simulation-recording  | 0-20                     | Ratio                | Implementation day       |

**Part 4:** Fill in the below information for each evaluation aim (*go back to earlier in the course where you*

| Variable                                     | Brief Description   | Data Source<br><br>Provide name of questionnaire, instrument, log sheet, etc.<br>Provide Question #'s on the tool that measure this variable | Possible Range of Values         | Level of Measurement | Timeframe for Collection                               | Statistical Test          |
|--|---|--|----------------------------------|----------------------|--|---------------------------|
| Knowledge                                    | Number of correct answers on post-test compared to pre-test | Pre-test/Post-test with verified face validity from 2 CRNAs outside of USF and 1 USF faculty member  | 0-7                              | Ratio                | 1 day: intervention day                                | Wilcoxon signed rank test |
| Dantrolene dose (Q1)                         | Dose if MH is suspected? Correct?                           | Pre-test/Post-test   | Correct answer?<br>0=No<br>1=Yes | Nominal: Dichotomous | Before QI PowerPoint and after simulation intervention | Wilcoxon signed rank test |
| What to mix Dantrolene with (Q2)             | What do you mix dantrolene with?                            | Pre-test/Post-test   | Correct answer?<br>0=No<br>1=Yes | Nominal: Dichotomous | Before QI PowerPoint and after simulation intervention | Wilcoxon signed rank test |
| LAST, first treatment of choice (Q3)         | LAST, first treatment of choice                             | Pre-test/Post-test   | Correct answer?<br>0=No<br>1=Yes | Nominal: Dichotomous | Before QI PowerPoint and after simulation intervention | Wilcoxon signed rank test |
| Next step when pt develops pneumothorax (Q5) | Treatment of choice during this situation                   | Pre-test/Post-test   | Correct answer?<br>0=No<br>1=Yes | Nominal: Dichotomous | Before QI PowerPoint and after simulation intervention | Wilcoxon signed rank test |
| SVT treatment (Q6)                           | Next step when SVT develops                                 | Pre-test/Post-test   | Correct answer?<br>0=No<br>1=Yes | Nominal: Dichotomous | Before QI PowerPoint and after simulation intervention | Wilcoxon signed rank test |

*have outlined these and copy/paste here*). Add as many evaluation aims as necessary by copying and pasting this section as many times as needed

**Aim 1:** Increase staff members knowledge of correct usage of the Stanford Emergency Manual for crisis management.

**Outcome/Indicator1a:** Perioperative staff members will have increased knowledge of the Stanford Emergency Manual as evidenced by a 20% increase in correct answers on post-test compared to the pre-test.

**Measure 1a:** The dependent variable is the number of right answers in proportion to the total number of test answers.

**Calculation of measure 1a :**

$$\frac{\text{The total number of right answers on the pre-test}}{\text{The total number of test answers}}$$

$$\frac{\text{The total number of right answers on the post-test}}{\text{The total number of test answers .}}$$
**Variables used for measure 1a: Complete the below table for your measure***\*\* All of pre-test/post-test questions used to measure knowledge*

**Outcome 1b:** Thirty percent of staff will recognize the importance of accessing the Manual when unsure of a critical step during crisis management as evidenced by Manual use on the post-test and/or during the simulation.

**Measure 1b :** The dependent variable is the number of staff adhering to the Manual during the simulation intervention and/or post-test in proportion to the total number of participants

**Calculation of measure 1b:**

$$\frac{\text{The number of staff accessing the Manual during the post-test}}{\text{The total number of staff participants}}$$

$$\frac{\text{The number of staff accessing the Manual during the simulation}}{\text{The total number of staff participants}}$$

$$\frac{\text{The number of staff listening to verbal instructions from a reader of the Manual during the simulation}}{\text{The total number of staff participants}}$$

**Variables used for measure 1b : Complete the below table for your measure**

| Variable  | Brief Description   | Data Source<br><i>Provide name of questionnaire, instrument, log sheet, etc.<br/>Provide Question #'s on the tool that measure this variable</i> | Possible Range of Values | Level of Measurement    | Timeframe for Collection | Statistical Test               |
|---|---|--|--------------------------|-------------------------|--------------------------|--------------------------------|
| Manual use on Post-test                                 | Determine if manual was used on post test                 | Post-test  | 0= no<br>1=yes           | Nominal:<br>Dichotomous | Implementation day       | Chi-square test (Cipher, 2017) |
| Manual use during simulation                            | Determine if manual was used during simulation            | Post-test (Box to check regarding manual used during simulation)   | 0= no<br>1=yes           | Nominal:<br>Dichotomous | Implementation day       | Chi-square test                |
| Manual use by listening to reader and completing action | Determine if manual adhered to during listening to reader | Post-test(Box to check regarding manual adhered to during simulation)  | 0= no<br>1=yes           | Nominal:<br>Dichotomous | Implementation day       | Chi-square test                |

**Aim 2:** Increase staff’s confidence in managing the simulated crisis.

**Outcome/Indicator 2a:** The “scenario” score sections on the SET-M tool will show an increase in confidence from the pre-SET-M scores compared to the post-SET-M scores.

**Measure 2a:** The dependent variable is the score of confidence added up on the SET-M “scenario” score sections pre-intervention and post-intervention.

**Calculation of measure 2a :**

Amount of confidence based on Likert score as measured on the “scenario” pre-intervention

---

The total score possible for the SET-M “scenario” section of surveys

Amount of confidence based on Likert score as measured on the “scenario” post-intervention

---

The total score possible for the SET-M “scenario” section of surveys

**Variables used for measure 2a : Complete the below table for your measure**

| Variable   | Brief Description  | Data Source<br>Provide name of questionnaire, instrument, log sheet, etc.<br>Provide Question #'s on the tool that measure this variable | Possible Range of Values                                  | Level of Measurement | Timeframe for Collection | Statistical Test       |
|------------|--|--|---|----------------------|--------------------------|------------------------|
| Confidence | Did confidence on "scenario" increase/decrease/no change due to intervention | SET-M tool (Leighton, 2015)  | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q1         | Prepared to respond to patient's condition changes                           | SET-M tool- Scenario section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q2         | Developed understanding of pathophysiology                                   | SET-M tool- Scenario section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q3         | Confident in assessment skills   | SET-M tool- Scenario section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q4         | Empowered to make clinical decisions   | SET-M tool- Scenario section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q5         | Have/ development understanding of medications                               | SET-M tool- Scenario section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |

|     |   |                             |   |         |                    |                        |
|-----|---|-----------------------------|---|---------|--------------------|------------------------|
| Q6  | Have opportunities to practice decision making skills | SET-M tool-Scenario section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |
| Q7  | Confident in ability to prioritize care/interventions | SET-M tool-Scenario section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |
| Q8  | Confident in communicating                            | SET-M tool-Scenario section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |
| Q9  | Confident to teach patients about illness             | SET-M tool-Scenario section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |
| Q10 | Confident to report information to healthcare team    | SET-M tool-Scenario section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |
| Q11 | Confident to do interventions for patient safety      | SET-M tool-Scenario section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |
| Q12 | Confident to use EBP in patient care                  | SET-M tool-Scenario section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |

**Outcome/Indicator 2b:** Twenty percent of SET-M scores reflected increased confidence when prebriefing occurred, as evidenced by the “prebriefing” score section on each of the SET-M survey tool.

**Measure 2b:** The dependent variable is the score of confidence added up on the SET-M “pre-briefing” scores pre-intervention and post-intervention.

**Calculation of measure 2b:**

Amount of confidence based on Likert score as measured on the “pre-scenario”  
pre-intervention

---

The total score possible for the SET-M “pre-scenario” section of surveys

Amount of confidence based on Likert score as measured on the “pre-scenario”  
post-intervention

---

The total score possible for the SET-M “pre-scenario” section of surveys

**Variables used for measure 2b : Complete the below table for your measure**

| Variable | Brief Description                | Data Source<br>Provide name of questionnaire, instrument, log sheet, etc.<br>Provide Question #'s on the tool that measure this variable | Possible Range of Values                                  | Level of Measurement | Timeframe for Collection | Statistical Test       |
|----------|----------------------------------|--|---|----------------------|--------------------------|------------------------|
| Q1       | Prebriefing increased confidence | SET-M tool (Leighton, 2015)- Prebriefing section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q2       | Prebriefing helpful to learning  | SET-M tool- Scenario section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |

**Aim 3:** Debriefing becomes a valuable component to the intervention

**Outcome/Indicator 3a:** Thirty percent of SET-M scores reflected “somewhat agree” in that debriefing was a valuable part of the intervention, as evidenced by the “debriefing” score section on each SET-M survey.

**Measure 3a:** The dependent variable is the scores of “somewhat agree” combined on the SET-M debriefing survey section of SET-M.

**Calculation of measure 3a:**

Amount of value that debriefing had on the intervention as evidenced by  
“somewhat agree” on the SET-M survey

---

The total score possible for the SET-M “debriefing” section of surveys

**Variables used for measure 3a and 3b: Complete the below table for your measure**

| Variable | Brief Description  | Data Source<br>Provide name of questionnaire, instrument, log sheet, etc.<br>Provide Question #'s on the tool that measure this variable | Possible Range of Values                                  | Level of Measurement | Timeframe for Collection | Statistical Test       |
|----------|--|--|---|----------------------|--------------------------|------------------------|
| Value    | The value that debriefing had on the intervention                        | SET-M tool (Leighton, 2015)  | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q1       | Debriefing was helpful to learning                                       | SET-M tool- Debriefing section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q2       | Debriefing helped me focus on feelings before scenario                   | SET-M tool- Debriefing section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q3       | Debriefing was valuable, helped me improve clinical judgement            | SET-M tool- Debriefing section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |
| Q4       | Debriefing provided a time for self-reflection of simulation performance | SET-M tool- Debriefing section   | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal              | Implementation day       | Descriptive Statistics |

|    |  |                                |   |         |                    |                        |
|----|--|--------------------------------|---|---------|--------------------|------------------------|
| Q5 | Debriefing was constructive evaluation of the simulation | SET-M tool- Debriefing section | 1= Do not agree<br>2= Somewhat agree<br>3= Strongly agree | Ordinal | Implementation day | Descriptive Statistics |
|----|--|--------------------------------|---|---------|--------------------|------------------------|

**Outcome/Indicator 3b:** Twenty percent of SET-M scores reflected “strongly agree” in that debriefing was a valuable part of the intervention, as evidenced by the “debriefing” score section on each SET-M survey.

**Measure 3b:** The dependent variable is the scores of “strongly agree” combined on the SET-M debriefing survey section of SET-M tool.

**Calculation of measure 3b:**

Amount of value that debriefing had on the intervention as evidenced by  
“strongly agree” on the SET-M survey

---

The total score possible for the SET-M “debriefing” section of surveys

**Variables used for measure 3b : Complete the below table for your measure (SEE CHART ABOVE)**

*\*\* All of SET-M survey (Leighton, 2015) will be used. The prebriefing and scenario will be used prior to the PowerPoint session and simulation and then used again after the simulation to compare results. The debriefing portion will only be used after the simulation.*

## References

- Cipher, D. J. (2017). Using statistics to determine differences. In J. Gray, S. Grove & S. Sutherland (Eds.), *The practice of nursing research: Appraisal, synthesis, and generation of evidence* (8<sup>rd</sup> ed., pp. 567-577). Elsevier.
- Leighton, K., Ravert, P., Mudra, V., & Macintosh, C. (2015). Update the Simulation Effectiveness Tool: Item modifications and reevaluation of psychometric properties. *Nursing Education Perspectives*, 36(5), 317-323. Doi: 10.5480/15-1671.
- Sylvia, M. L. & Terhaar, M. F. (2018). *Clinical analytics and data management for the DNP* (2<sup>nd</sup> Ed.). Springer Publishing Company, LLC.

**Appendix N: DNP Project Initial Approval Form**

USF NURS 715 Student ATTESTATION LETTER to the USF IRB



## DNP Scholarly Project Proposal Initial Approval

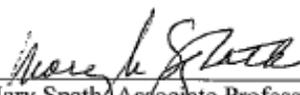
**To:** Amanda Huff, DNP-NAP Student  
**From:** Dr. Susan Lown, Course Coordinator NURS 715  
**Re:** DNP Project Proposal Review Council Endorsement  
**Date:** 11-12-2020

**DNP Scholarly Project Title:** Stanford Emergency Manual Use During Operating Room Crises

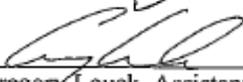
**DNP Scholarly Project Review Council:**

DNP Project Advisor

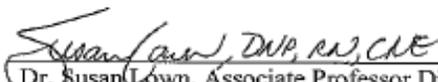
Signature:

  
 \_\_\_\_\_  
 Dr. Mary Spath, Associate Professor of Nursing

DNP Project Proposal  
 Review Council  
 Member Signature:

  
 \_\_\_\_\_  
 Dr. Gregory Louck, Assistant Professor Division of Nursing  
 and Assistant Director Nurse Anesthesia Program

DNP Project Proposal  
 Review Council  
 Member Signature:

  
 \_\_\_\_\_  
 Dr. Susan Lown, Associate Professor Division of Nursing

Date of initial approval by DNP  
 Scholarly Project Review Council:  
 11-14-19

- 1 - Graduate Office
- 2 - Student File
- 3 - Attached to Proposal

2701 Spring Street  
 Fort Wayne, Indiana 46808

Phone: 260-399-7999  
 Fax: 260-399-8156  
[sf.edu](http://sf.edu)



**Appendix O: Student Attestation Letter**

Date: 9/18/2020

Student Name: Amanda Huff

**RE: NURS 715 Executive Summary explaining the doctoral student's proposal for their DNP Scholarly Project**

Dear USF IRB Committee member,

The USF DNP faculty has given the CRNA-DNP students the option of writing their DNP Scholarly Project proposals in the past tense. The purpose of this is to help minimize the need to revise written work after projects have been implemented and evaluated.

When reviewing this proposal, you will note it is written in past tense. This letter is to formally inform you that I have not begun the implementation of my project at this time.

I understand that I will need to have a formal letter of approval from the USF IRB Committee, and that I will have to have met any outstanding requirements indicated by the IRB Committee, prior to beginning the implementation phase of my project.

Student Name (print): Amanda Huff

Student Signature: Amanda Huff

*I have read and understand the academic integrity/plagiarism policy as outlined in the course syllabus, the Nursing Student Handbook appropriate to my program of study and the USF Student Handbook relating to the USF Academic Integrity and Plagiarism Policy. By affixing this statement to the title page of my work, I certify that I have not violated any aspect of the USF Academic Integrity/Plagiarism Policy in the process of completing this assignment. If it is found that I have violated any of the above mentioned policy in this assignment, I understand the possible consequences of the act(s), which could include dismissal from USF.*

Amanda Huff

9/18/2020

*Student Signature*

*Date*

## Figures

Figure 4.1 details the number of total correct and incorrect answers for each of the five knowledge questions on the pre-test.

**Figure 4.1**

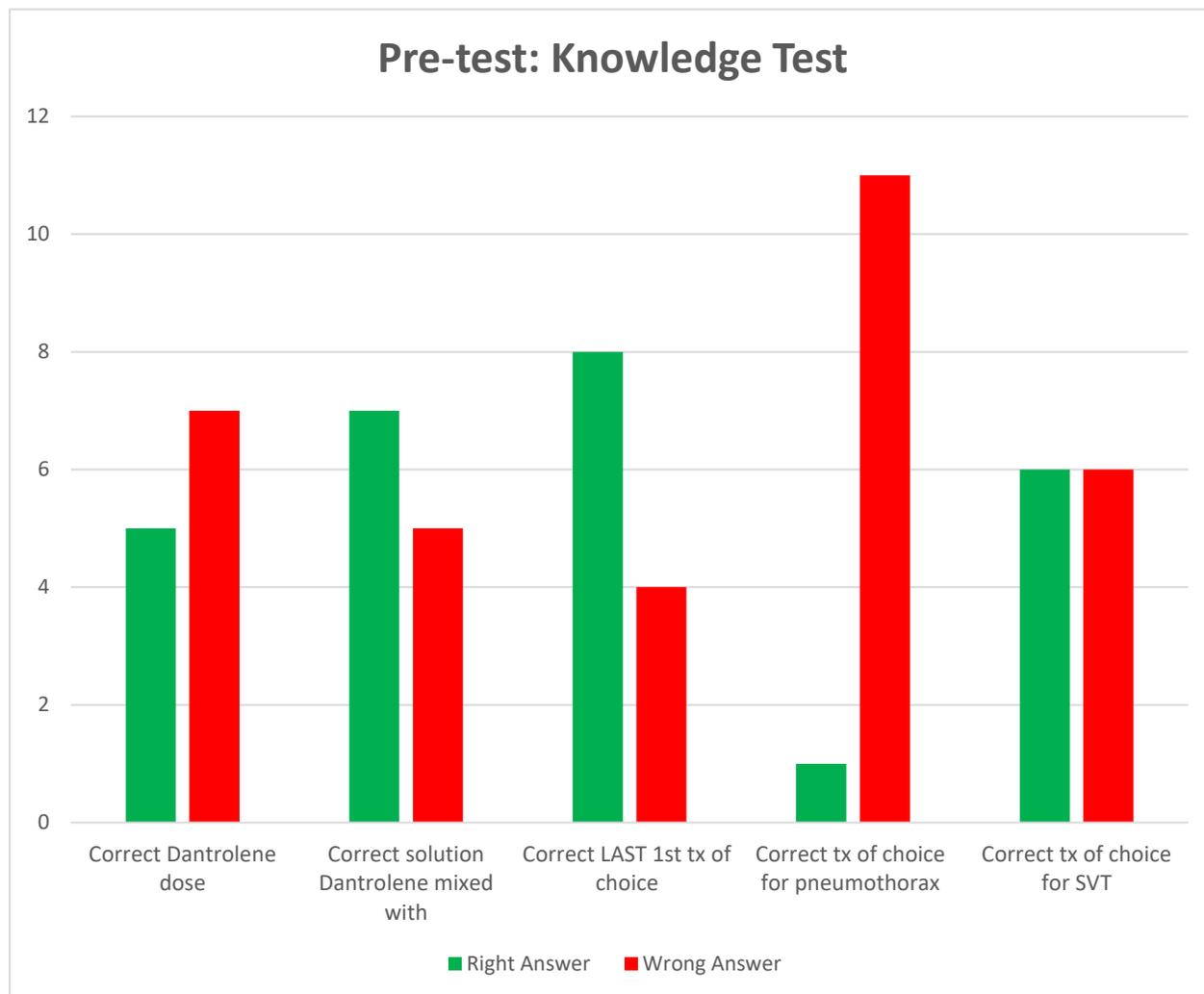


Figure 4.2 details the number of total correct and incorrect answers for each of the five knowledge questions on the post-test.

**Figure 4.2**

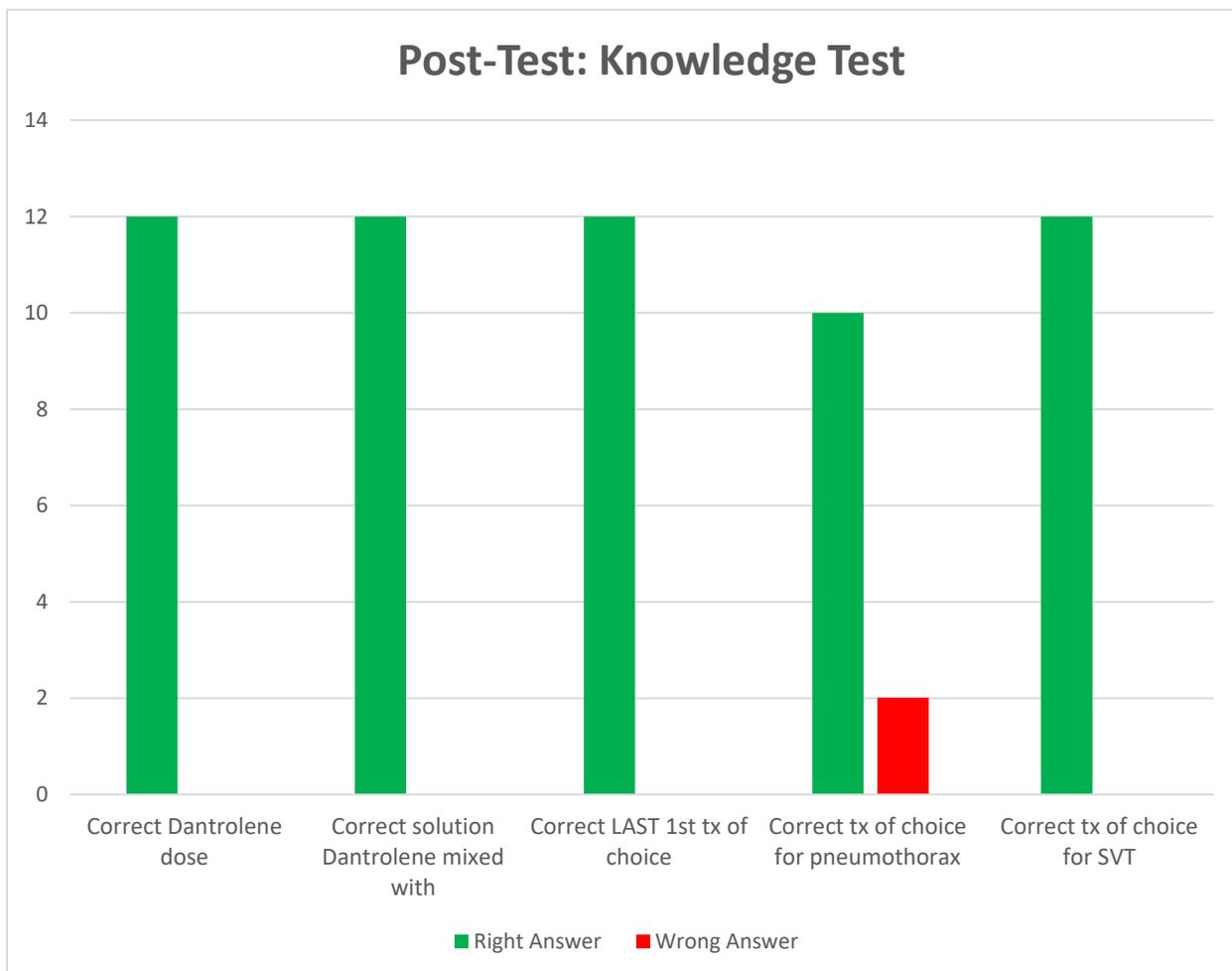


Figure 4.3 states each question of the scenario portion of the pre- SET-M tool. The y axis correlates with the number of participants that selected each answer choice for each of the 12 scenario questions.

**Figure 4.3**

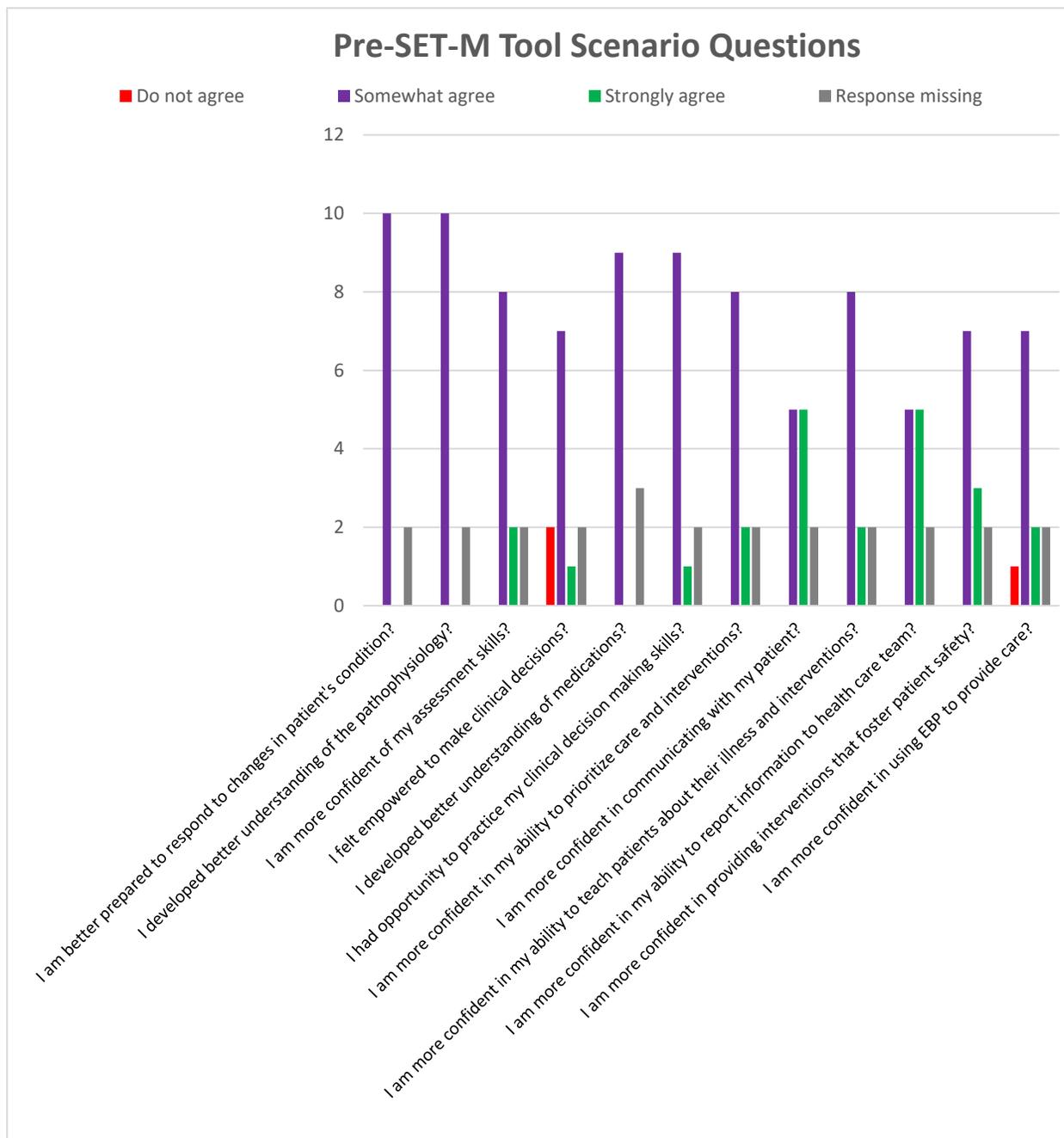


Figure 4.4 states each question of the scenario portion of the post-SET-M tool. The y axis correlates with the number of participants that selected that answer choice for each of the 12 scenario questions.

**Figure 4.4**

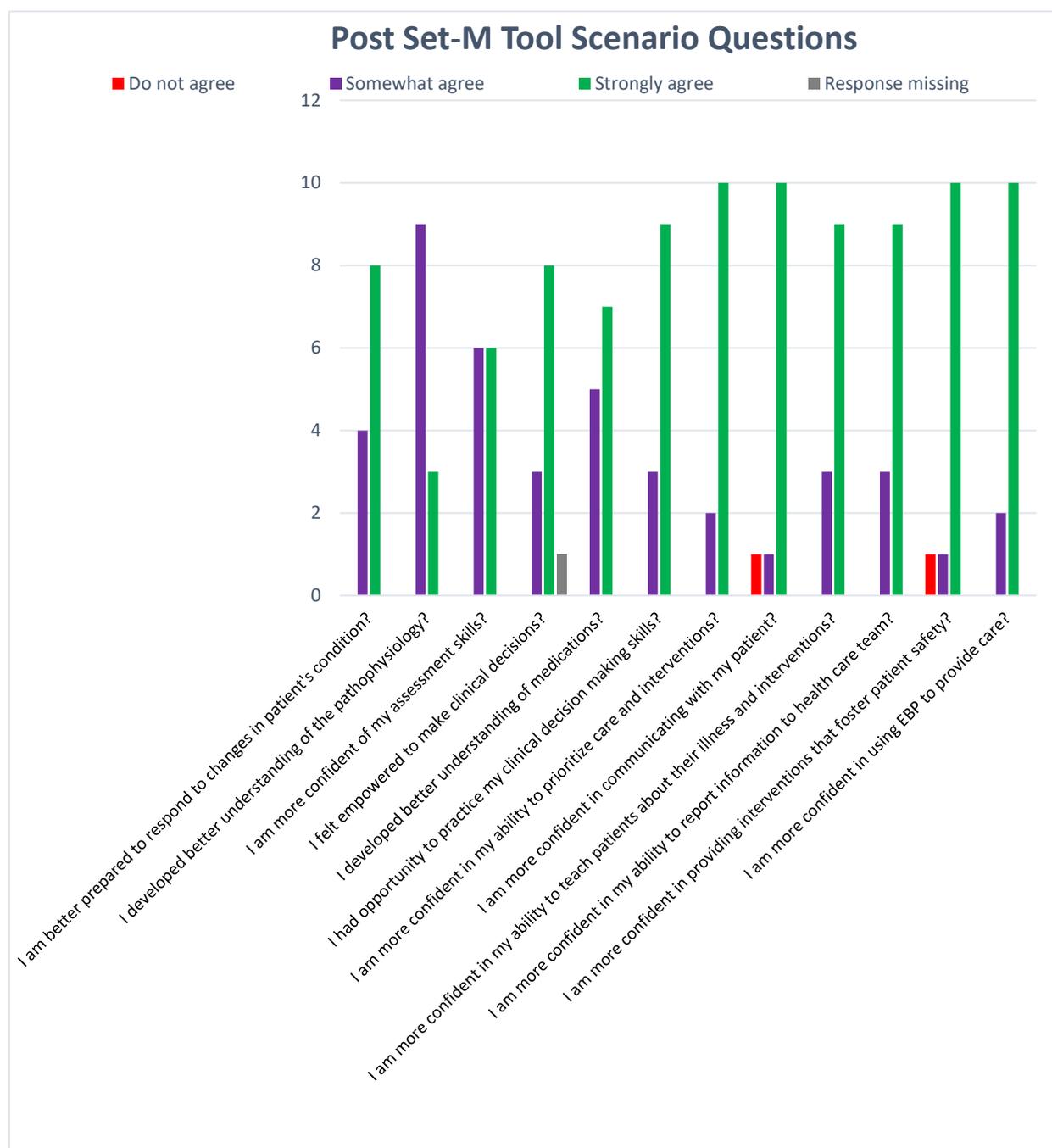


Figure 4.5 displays the number of participants for each question on the y axis and the individual five questions on the x axis.

**Figure 4.5**

