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An Exploration of Nurses' Perceptions of Resuscitation of Spinal Cord and Traumatic Brain Injured Patients

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An Exploration of Nurses' Perceptions of Resuscitation of Spinal Cord and Traumatic Brain
Injured Patients

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Submitted to Pamella Stoeckel, Ph.D., RN, CNE in partial fulfillment of

The Doctor of Nursing Practice Degree

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Abstract

The study explored nurse perceptions of resuscitation of Spinal Cord injured (SCI) and Traumatic Brain injured patients (TBI) with nurses at a specialty rehabilitation hospital. Research shows that cardiac arrests that occur within hospitals but outside of critical care or emergency departments are challenges for first responders who are generally nurses (Ranse & Arbon, 2008; Morrison et al., 2013). SCI and TBI patients are at increased risk for cardiac arrest which can extend into the rehabilitation period (Casha & Christie, 2011). In settings where emergencies are not the norm, additional anxiety and stress are created for these first responders, especially when patient lengths of stay are long and the patients are well known. This capstone project examined nurse's perceptions of resuscitation of TBI and SCI patients. An interpretive phenomenological design was used to interview a purposive sample of eight nurses who had experienced resuscitation of a TBI or SCI patient. The nurse researcher conducted 45-60 minute face to face interviews that were audio-recorded, transcribed and coded for themes using constant comparative analysis. Three broad themes with subthemes emerged from the interviews: *Calling Code Blue*, *Code Blue Event* and *Debrief*. Subthemes under *Calling Code Blue* were *History and Presentation* and *Staff Reaction*. Subthemes under *Code Blue Event* were *Shifting Leadership*, *Shifting Roles* and *Challenges*. Subthemes under *Debrief* were *Immediate Needs*, *Solitary Reflection* and *Root Cause Analysis*.

Key Words: DNP Capstone project, resuscitation, code blue, nurse perceptions, spinal cord injury, traumatic brain injury, rehabilitation.

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Sincerely,

Lisa

An Exploration of Nurses' Perceptions of Resuscitation of Spinal Cord and Traumatic Brain Injured Patients

Executive Summary

Problem

Nurses consistently identify the need for further education with resuscitation of TBI/SCI patients. They also experience an increase in the level of responsibility for managing resuscitation due to a decrease in contractual support from a code team at a neighboring hospital. Many inexperienced new nurses are on staff at the specialty hospital. Literature is sparse in relation to in-hospital resuscitation of specialty populations such as TBI and SCI individuals.

Purpose

The purpose of the study was to investigate the perceptions of nurses who had an active role in resuscitation of TBI or SCI patients in order to identify needs and enhance policies, procedures and educational programs surrounding resuscitation of the specialty populations. The purpose was to gain insight into nurse perceptions to improve education efforts and support systems. The research question was: In nurses working with spinal cord injured (SCI) and/or traumatic brain injured (TBI) patients at a specialty rehabilitation hospital who have participated in a patient resuscitation, how do nurses perceive in-hospital resuscitation?

Goals

The goal of this project included gaining insight into how nurses perceived resuscitation with traumatic brain and spinal cord injured patients to aid nurse educators in enhancing policies, procedures, and educational programs.

Objectives

The objectives for this capstone project were to interview and record participants who had experienced resuscitation of SCI and TBI and then code their perceptions of the experience.

Plan

This study used a qualitative interpretive phenomenological design that involved 45-60 minute face to face interviews conducted by the researcher with study participants. A purposive sample of eight nurses who had actively participated in resuscitation with TBI or SCI patients was identified. Interviews were recorded, transcribed and coded for themes using constant comparative analysis.

Findings and Results

Three broad themes with subthemes emerged from the interviews: The theme of *Calling the Code Blue* included the need for participants to quickly recognize history and presentation of the TBI/SCI patient and appropriately react. Patient arrests were sudden with little time to prepare. Staff reactions consistent with "fight or flight" varied with the arrival of crowds to the scene. The second theme of *Code Blue Event* included shifting leadership between nurses, physicians and the code blue team; shifting roles between nurses and other professionals; challenges of patient access, roommate or family presence, and personal attachments with patients. Nurses revealed a final a final theme of *Desire for Debrief*. This theme involved immediate support of staff emotional needs; solitary reflection at home, and root cause analysis.

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An Exploration of Nurses' Perceptions of Resuscitation of Spinal Cord and Traumatic Brain Injured Patients

Over 200,000 patients per year suffer cardiac arrest while in hospitals (American Heart Association, 2015). According to Morrison et al. (2013) in-hospital cardiac arrests have not received the same research attention as out of hospital cardiac arrests. Authors indicate, “there are many gaps in science, policy, and institutional application and accountability for care of these patients” (p. 1538). General assumptions have pervaded that outcomes from research related to out of hospital cardiac arrests can be directly applied to in-hospital cardiac arrests “with no consideration given to the different causes and burden of co-morbidities that contribute” (Morrison et al., 2013, p. 1539). Each hospital is forced to evaluate best practices and develop policies and procedures specific to their institutions surrounding response to cardiac arrest (Boehm, 2006).

In-hospital cardiac arrests occurring outside of an emergency room or intensive care unit present their own challenge (Ranse & Arbon, 2008). Typically nurses with varying levels of emergency training respond to these arrests until ICU or ED clinicians arrive or a transfer of care can take place (Pusateri, Prior, & Kiely 2011). Traumatic spinal cord injured (SCI) and traumatic brain injured (TBI) patients require comprehensive rehabilitation along a care continuum from intensive trauma treatment to rehabilitation and follow-up care. Patients are at risk for cardiac arrest, which can extend into the rehabilitation phase of recovery (Casha & Christie, 2011). Survival following cardiac arrest is lower than in general patient populations for both TBI (McNett & Gianakis, 2010) and SCI patients (Caruso, Carter, Cifu & Carne, 2014). There is a paucity of literature about resuscitation of the TBI or SCI patient especially during the rehabilitation phase.

Resuscitation involves cardiac arrest which is defined by the American Heart Association (AHA; Sinz & Navarro, 2010) as “temporary or permanent cessation of the heartbeat” (p. 168). Cardiac arrest is not the same as a heart attack or myocardial infarction (MI) because it is characterized by a malfunction in the electrical signals of the heart, which can be caused by a variety of underlying reasons (AHA, 2015). When cardiac arrest occurs inside the hospital, actions are required by a team of clinicians that include basic life support (BLS) measures, cardiopulmonary resuscitation (CPR), advanced cardiac life support (ACLS) measures, effective resuscitation team dynamics, and immediate post-cardiac arrest care (Sinz & Navarro, 2010). Appropriate in-hospital cardiac arrest measures are taken in accordance with best practices, AHA BLS and ACLS guidelines, and the specific institutional policies and procedures (Boehm, 2006).

The occurrence of in-hospital cardiac arrest in the rehabilitation setting is not well documented. The literature is clear that repetition and practice of basic life support (BLS) and advanced cardiac life support (ACLS) skills is necessary for confidence and competence (Castro, Cruz & Briones, 2014), however recertification only occurs every two years. When nurses have little practice and limited support and resources for resuscitating high-risk patients, anxiety, fear and stress can result (Roh, Issenberg, Chung, Kim & Lim, 2013). When cardiac arrest necessitating resuscitation occurs at a specialty SCI or TBI rehabilitation center without an ICU, the rehabilitation nurse is a primary responder. In addition to careful consideration of SCI or TBI specific co-morbidities, the nurse also struggles with role clarity and anxiety related to patient and/or family relationships. According to the American Nurses Association (ANA) and the Association of Rehabilitation Nurses (ARN), the role of the rehab nurse is multifaceted and complex. The goal of rehabilitation nursing is to assist a person with a disability and/or chronic illness with maximizing independence and function. Rehabilitation settings vary from more acute

to long term care. The nurse may serve as caregiver, teacher, collaborator, and advocate (ANA; ARN, 1986).

SCI and TBI patients will spend a range of 21-98 days in rehabilitation and will need a lifetime of follow-up care for their disability (National Spinal Cord Injury Statistical Center, 2013; TBI model systems database, 2012). Nurses in the rehabilitation setting become intimately familiar with patients and families. A documented phenomenon amongst care providers of SCI and TBI patients and families is the risk for crossing of boundaries from professional to personal and emotional relationships, perhaps related to the vulnerability of the patients and families who reach out for support and the inexperience of new graduate clinicians who desire to be liked by their patients and families (Warren, Hamilton & Roden-Foreman, 2013). TBI nurses report the provision of emotional support for patients and families as a basic competence for caring (Coco, Tossavainen, Jääskeläinen, & Turunen, 2013). The longstanding relationships nurses form with their patients and families may increase the level of anxiety experienced during an emergent situation with a patient whom the nurse is very familiar. Dwyer (2008) reports barriers to family initiated CPR related to family-member fear of failing and anxiety related to performing CPR on a person they know and care about. Clinicians at specialty rehab hospitals verbalize that patients become like family to them. In order to provide training and education specific to in-hospital resuscitation of SCI and TBI patients at a specialty rehabilitation hospital, more information is needed about nurses' experiences.

Problem Recognition and Definition

Purpose Statement

The purpose of this study was to investigate the experience of nurses who participated in patient resuscitation with SCI and TBI patients. Nurse educators desire to provide services that

meet the needs of managers and staff nurses in providing the best possible care for SCI and TBI patients during critical events. Understanding nurses' experiences during resuscitation from their own words will provide information that leads to the development of guidelines, policies and educational programs, including simulations, that support nurses and managers who face resuscitation of an SCI or TBI patient. Re-certification in BLS and CPR is a routine process all staff follows every two years.

Problem Statement

A specialty rehabilitation hospital that cares for spinal cord injured (SCI) and traumatic brain injured (TBI) patients found through an annual survey that nurses and support staff listed mock codes and CPR as the areas of most educational need. In the 2014 annual education needs survey it was revealed that 44.41% of staff reported they would attend mock code training no matter when it was is offered and 55.15% reported they would attend if the time was convenient for them. The following year the 2015 survey revealed that 30.3% would attend mock emergency training no matter what time it is offered and 65.15% would attend training if offered at a time that was convenient for them. Staff also requested in informal conversations that they were interested in more information about CPR with SCI and TBI rehabilitation patients.

The need for greater understanding and competence in CPR is further supported by a policy change related to who is expected to respond to resuscitation at the rehabilitation hospital. Historically, the rehabilitation hospital relied upon the emergency response team or "code team" of a neighboring hospital to manage patient resuscitations. In 2012 simultaneous resuscitations occurred between the rehabilitation hospital and the neighboring hospital prompting a change in policy. To ensure that the neighboring hospital needs are met, contractual support for the code team was decreased for the rehabilitation hospital to one code team nurse with a goal for the

rehabilitation hospital to independently manage resuscitations before transfer to the neighboring hospital intensive care unit (ICU) or emergency department (ED). An additional challenge for nurses is that the physicians who respond to the resuscitations during day shift hours are not ACLS certified. ACLS nurses are responsible for leading the team through resuscitation, and directing the physician to order medications based on AHA ACLS guidelines (2010). During the night-shift, the hospital has no physician in house. Nurses have to request orders based on ACLS protocols over the phone. Nurses report that this situation produces additional anxiety.

Nurses and managers at the rehabilitation hospital are competent in meeting the medical and rehabilitation needs of their patients, but few have critical care experience. It was determined that 60% of staff nurses and 59% of nurse leaders at the rehabilitation hospital were hired as new graduates with less than one year of experience. There are not repetitive critical experiences present at the hospital as it does not have an ICU or ED. Overall, pre-hospital mortality rates nationwide are improving following traumas due to technology and extensive training with emergency medical services (EMS) providers with cardiopulmonary resuscitation (Johansson et al., 2012). This rehabilitation hospital has experienced a related increase in patient acuity over the past decade. In addition the hospital has begun accepting patients with cardiac monitoring since 2009 who previously were transferred to the neighboring hospital.

Nursing staff are currently more likely to experience patient emergencies and rely on basic life support (BLS) and advanced cardiac life support (ACLS) training than in previous years. The numbers of nurses at the hospital certified in ACLS has increased from 20% in 2010 to over 75% in 2014 to meet the increased demands. Due to rising acuity levels and monitoring capabilities, the numbers of emergency events and cardiac arrest events has also increased.

From third quarter 2012 through fourth quarter 2013, nursing staff experienced eight patient resuscitations. During these events, no pulse was detected and cardiopulmonary resuscitation (CPR) efforts were initiated. Of the eight resuscitations, four patients survived the event (50%) and four patients died. Lukas and colleagues (2012) report that although training of pre-hospital providers has increased the quality of compressions and overall CPR outside of the hospital, in-hospital CPR survival rates are lower at 44% of cardiovascular related events and 23% of cardiopulmonary related events. Although the rehab hospital survival rates are comparable to the national average, nurses desire to provide the best possible care and chances of survival following cardiac arrest.

More information is needed to identify why nurses are requesting additional education and in which areas. The proposal and following study outline resuscitation of the TBI or SCI patient during the rehabilitation phase from the perspective of the nurse. For the purposes of the study, the combination of measures taken to revive a patient from cardiac arrest in the hospital including CPR, BLS, ACLS, IV fluid or medication interventions, defibrillation, recording or documenting, team leading, and family witnessed support will be referred to as “resuscitation.”

PICO and Research Question

This project is an evidence-based practice (EBP) project in which a quality improvement plan was completed. The project was internal to the agency and informs the agency of issues regarding health care quality, cost, and satisfaction. The results of this project are not meant to generate new knowledge or be generalizable across settings but rather seek to address a specific population, at a specific time, in a specific agency. These projects translate and apply the science of nursing to the greater health care field.

Projects utilize the acronym “PICO”, rather than stating a formal research hypothesis.

The acronym stands for: Population (P), Intervention or Issue of Interest (I), Comparison group or Current Practice (C), and Outcome (O) and is usually framed as a question (Melnik & Fineout-Overholt, 2011, p. 31). The PICO for this DNP capstone project is:

P: Population: Nurses working at a specialty rehabilitation hospital

I: Intervention- Participation in in-hospital patient resuscitation with SCI or TBI patients

C: Comparison- None

O: Outcome- Perceptions of the experience of in-hospital resuscitation

The question this study seeks to address is: In nurses working with spinal cord injured (SCI) and/or traumatic brain injured (TBI) patients at a specialty rehabilitation hospital (**P**) who have participated in a patient resuscitation (**I**), how do nurses perceive in-hospital resuscitation (**O**)?”

Project, Scope, Significance, and Rationale

Project Scope

This project is a quality assessment project to determine the education and training needed by nurses at one specialty rehabilitation hospital regarding resuscitation of SCI and TBI patients.

Significance

With a need for research about in-hospital cardiac arrests with specialty populations, this project provides insight into how the nurses who care for SCI and TBI patients perceive the process of resuscitation of an SCI or TBI patient.

Rationale

This study provides insights into the perspectives of nurses surrounding in-hospital resuscitation of an SCI or TBI patient and the process. Findings from the study help improve guidelines, procedures, and education for nurses working with SCI or TBI patients.

Theoretical Foundation

The conceptual framework for this study is Lazarus's Theory of Stress and Coping (1966). This model provides the theoretical framework for the DNP capstone project. Stress is considered to be a transactional phenomenon depending on the meaning of the stressor to the perceiver (Rice, 2012). Stressors are demands made by the external or internal environment which require action to restore balance. Coping with stress involves a transaction between the person and the environment. Coping is determined by the person's appraisal of the stressor and the social and cultural resources available for managing the stressful event (Rice, 2012). It is recognized that both internal and external stressors are present in the resuscitation experience. Internal stressors are related to feelings of uncertainty, lack of composure and moral conflict such as the inappropriateness of the resuscitation event. External stressors are related to feelings of oppression, burden, poor patient outcomes and lack of education (Ranse & Arbon, 2008). Nurses in the study are expressing feelings of stress about performing CPR with SCI and TBI patients.

The nursing theory which offers a theoretical framework for the project is the Betty Neuman's Systems Theory (Neuman & Fawcett, 2011). Neuman's Systems Theory posits that there is an internal, external and created environment impacted by intra-personal, inter-personal and extra-personal stressors. According to Neuman's theory, illness is an excessive expenditure of energy. When more energy is used by the system in a state of disorganization than is built and stored, the outcome may be death (Neuman & Fawcett, 2011). Reconstitution is the increase in

energy required in reaction to the stressor to return and maintain systems stability following treatment of the stressor. Neuman's theory is applicable to the DNP capstone project because nurses are reacting to the stressor experienced by the patient causing cardiopulmonary arrest and helping the patient reconstitute to provide system stability through resuscitation. In order to help the patient, the nurse must be able to effectively cope with external stressors in the environment with resources available to allow reconstitution. The nurse is helping the patient restore system stability through CPR, BLS, ACLS and effective team dynamics. Both theories support the DNP capstone project, which seeks to increase understanding about an event that causes stress for the nurses and SCI and TBI patients through the eyes of the nurse.

Literature Selection

A literature search for the keyword "Resuscitation" conducted on CINAHL, EBSCO-host, and Academic Search Premier Databases resulted in 43,613 articles. With the keywords "nursing" and "resuscitation" added, there were 5,359 articles. With a modifier added of dates 2009-2015, 2,341 articles resulted. With the keywords "nursing", "resuscitation" and "perception", the search yielded 52 articles. Other keywords explored through the databases mentioned as well as Google Scholar, and Pubmed, and MEDLINE include "spinal cord injury", "traumatic brain injury" combined with "nursing" and "attitudes" or "perceptions". The systematic literature review resulted in 40 relevant articles to the study. Twenty-nine articles are cited in the proposal.

Scope of Literature

Inclusion criteria for this literature review included nurse perceptions related to in-hospital resuscitation. Supporting literature include studies that demonstrate acuity levels of TBI and SCI patients or specific resuscitation criteria related to the populations. Exclusion criteria

include out of hospital resuscitations. The scope of literature revealed some peer-reviewed, scholarly articles that support the capstone discussion. Some gaps in the literature were revealed. Melnyk's (2011) levels of evidence I-VII were used. Due to the limited evidence available, case studies, opinion pieces and quality improvement projects were included.

The systematic literature review resulted in eight quantitative studies including one cross-sectional descriptive survey, one observational study, three integrative reviews, which included one review with randomized control trials included, one primary database analysis and one secondary analysis; two prospective descriptive analyses, two retrospective chart review analyses, nine qualitative studies including one phenomenological study and eight descriptive survey studies; six quality improvement initiative and opinion pieces and one consensus statement based on evidence and expert opinions. The review resulted in two level I studies, one level II study, four level IV studies, four level V studies; 17 level VI studies and one level VII study.

Review of Literature

This review of literature is organized into four sections that address the background of the study. The four sections are: description and explanation of in-hospital resuscitation; in-hospital experiences of resuscitation, SCI and TBI patients and resuscitation, and training in preparation for resuscitation. The review of literature demonstrates a need for the DNP capstone project. The nurse perceptions of resuscitation of TBI or SCI patients during rehabilitation have not been previously studied.

Description and Explanation of In-Hospital Resuscitation

Resuscitation is defined by the American Heart Association (AHA) Advanced Cardiac Life Support Provider Manual (Sinz & Navarro, 2010) as a coordination of healthcare providers

to direct management of cardiac or pulmonary arrest through basic life support (BLS), high quality compressions, advanced cardiac life support (ACLS), effective resuscitation team dynamics, and immediate post-cardiac arrest care (p. 1). Provider training of ACLS is designed to improve outcomes for adult patients with cardiac arrest or other cardiopulmonary emergencies. According to the ACLS provider manual, BLS is defined as “emergency treatment of a victim of cardiac or respiratory arrest through cardiopulmonary resuscitation (CPR) and emergency cardiovascular care” (p. 168), CPR is defined as a basic emergency procedure for life support consisting of mainly manual external cardiac massage and some artificial respiration” (p. 168), ACLS is defined as “emergency medical procedures in which basic life support efforts of CPR are supplemented with drug administration, IV fluids, etc.” (p. 168). The ACLS provider manual emphasizes that “successful resuscitation attempts require healthcare providers to simultaneously perform a variety of interventions” which requires not only mastery of tasks, but also effective leadership and team member behaviors and communication (Sinz & Nararro, 2010, p. 17). The ACLS provider manual represents recommendations for best practices for cardiac arrest (Boehm, 2006).

Holcomb (2002) reports that ventricular fibrillation (VF) is the most common cause of in-hospital cardiac arrest. Early defibrillation is the intervention needed to correct VF. According to Boehm (2006) quality resuscitation should be evaluated. There is a gap in literature and practice as to what measures hospitals should collect in order to evaluate care during resuscitation (Morrison, et. al., 2013). Evaluating CPR is important since there is a direct correlation between the quality of CPR and victim survival (Holcomb, 2002; Morrison et al., 2013).

In addition to Joint Commission tracking measures such as patient demographics, number and length of codes, and survival rates, hospitals should collect data to evaluate actual quality of

CPR during the event such as following recommendations for chest compressions at a rate of at least 100 per minute, at a depth of at least two inches, allowing for full chest recoil; defibrillation within recommended timeframes and no pauses during CPR of more than 10 seconds (Sinz & Navarro, 2010). Ventilation rates should be at a rate of 12 breaths per minute (Sinz & Navarro, 2010), however, out of hospital resuscitations estimate averages of up to 37 breaths per minute due to anxiety of healthcare providers without specific repetitive training (Holcomb, 2002). An initiative by the American Heart Association (AHA) called “*Get with the Guidelines*” establishes tracking measures for quality CPR for hospitals to benchmark and evaluate resuscitations. The guidelines established are not currently enforced or tracked by any regulatory agencies (Morrison et al., 2013). It is difficult to evaluate the quality of in-hospital resuscitation since there are no established tracking measures and a lack of current research of in-hospital cardiac arrest.

Documentation of actions during resuscitation should take place by a designated person during the resuscitation efforts according to Holcomb (2002). High rates of documentation errors are estimated due to a lack of practice with recording, lack of effective communication about actions during resuscitation from the team to the recorder and lack of familiarity with the forms used by the institution.

The team leader plays an important role in the resuscitation process in knowing his or her own strengths and limitations as well as those of each care provider. Each team member should ask for assistance during the resuscitation process if they are uncomfortable with any task assigned by the leader (Sinz & Navarro, 2010, p. 21).

In Hospital Experiences of Resuscitation

The literature indicates that the stress graduate nurses experience while participating in a resuscitation event is similar to undertaking a clinical skill for the first time. Research shows that

nurses outside the critical care arena have similar emotionally taxing responses to resuscitation as bystanders or family witnessed out of hospital arrests (Ranse & Arbon, 2008).

Ranse and Arbon (2008) categorize four main areas of the lived experience of resuscitation for nurses in non-critical areas: “needing to decide” a role in participation based on comfort level, and education, “having to act” based on recognition of patient deterioration and previous simulated resuscitation experience, “feeling connected” either from confusion about how to emotionally respond or benefiting from recognition of a learning opportunity and “being supported” by hospital resources, need for formal debrief and informal emotional support of colleagues. Authors emphasize the importance of formal debriefing as well as personal coping strategies following the resuscitation event. Confiding in peers, co-workers and with family was important for nurse’s stress management. The finding is consistent with de Boer, van Rikxoort, Bakker and Smit (2014) who found that ICU nurses reported it is helpful to talk with colleagues following critical incidents, but felt they needed more support through a formal debriefing process. Debriefing is a chance to review occurrences, review the performance of peers and the emotions felt during the process. The debrief is where learning from mistakes takes place according to de Boer, et al. (2014).

Saevareid and Balandin (2011) report levels of anxiety and stress among nurses surrounding resuscitation of elderly patients, especially without clarity or an order for “Do Not Resuscitate” (DNR). Availability of the DNR was important for participants. Mitchell, Schatz and Francis (2014) found that availability of resources such as a Rapid Response Team (RRT) is beneficial for reducing cardiac arrest occurrence outside of the ICU. Pusateri, Prior and Kiely (2011) report that availability of a rapid response team positively impacts nurse perceptions of in-hospital resuscitation. Authors also indicate that having such a resource is cost-effective. In

many hospitals, a Rapid Response Team (RRT) is implemented for prevention of cardiac arrest for patients that are compromised as a resource for the non-ICU nurse who recognizes patient deterioration (Mitchell, Schatz & Francis, 2014). Shapiro, Donaldson and Scott (2010) report nurses feeling a sense of relief when RRTs are available. Pusateri, Prior and Kiely (2011) suggest that non-ICU nurses in hospital settings have varying degrees of understanding of their role during a resuscitations and anxieties surrounding actions during resuscitation with an RRT. Perception of teamwork enters into the resuscitation situation from general practice according to (Mahramus, Frewin, Penoyer, & Sole, 2013). Teamwork is another important factor that affects nurse perceptions of in-hospital resuscitation.

Many studies surrounding nurse perception or attitudes and resuscitation are related to family witnessed CPR. Perspectives vary; however, most healthcare professionals believe it is helpful for the family and the healthcare team to have the family present during resuscitation efforts (Sak-Dankosky et al., 2014). Family presence has an impact upon the perceptions of healthcare professionals during resuscitation. A healthcare provider should be assigned to the family to explain what is happening during the resuscitation. Gallagher and McGovern (2008) report deficiencies in healthcare professional's knowledge of in-hospital resuscitation ethics and outcomes, which compromise the integrity of resuscitation decisions.

In-hospital cardiac resuscitation creates fear and anxiety for nurses who do not routinely participate in critical situations. Castro, Cruz and Briones (2014) implemented a quality initiative in a Long Term Acute Care setting. Nurses in the setting relied upon an adjacent hospital code team, which was located several minutes away. Nurses reported lack of confidence and anxiety surrounding chest compressions, defibrillation, teamwork, and advanced cardiac life support skills.

SCI and TBI Patients and Resuscitation

Both TBI and SCI patient populations are at increased risk than general populations for emergencies and in-hospital cardiac arrest due to population-specific co-morbidities. SCI patients may experience sudden cardiac changes due to orthostatic hypotension, tracheal suctioning, deep vein thrombosis (DVT) and pulmonary emboli (Britt, Zolfaghari, Kennedy, Pagel & Minghini, 1996; Casha & Christie, 2011) or autonomic dysreflexia (AD). AD is an emergent condition unique to SCI caused by a painful stimulus and characterized by a sudden dangerous increase in systemic blood pressure which, if not treated properly, could lead to seizure, stroke, brain injury and death (Furlah, 2013). TBI patients are also at increased risk for hemorrhage, secondary brain injury, increased intracranial pressure, and prolonged seizure activity (Stein, McArthur, Etchepare & Vespa, 2012), which can contribute to in-hospital cardiac arrest.

SCI patients are at increased risk for cardiopulmonary insufficiency (Casha & Christie, 2011) and dysrhythmias which could lead to cardiac arrest up to one month after injury and well into the rehabilitation period (Bartholdy et al., 2014). The timeline for progression from an ICU setting to rehabilitation is determined by many factors including insurance coverage, patient stability and readiness for rehabilitation, however there is no definition for a concrete period where patients are no longer at great risk for cardiac arrest (Casha & Christie, 2011). TBI patients are also considered to be at high risk for cardiac complications and cardiac arrest given the nature of traumatic injuries, risk of increased intracranial pressure (ICP), and the risk of seizure activity, even after successful resuscitation post-trauma (Stein, McArthur, Etchepare & Vespa, 2012).

Caruso et al. (2014) found that healthcare providers of SCI patients are generally unaware

of patient wishes in regards to resuscitation although SCI patients are one-third less likely to survive in hospital cardiac arrest than the general populations.

The role of the nurse who cares for the SCI or TBI patient during the rehabilitation phase of recovery can be unclear to the nurse, patients and other professionals. SCI nurses perceive themselves as important to the rehab process but don't always view themselves as rehab nurses since patients are also acutely ill and recovering from significant traumas (Pellat, 2003; Pellat, 2005). Role clarity is important in the resuscitation process and role perceptions during cardiac arrest can transcend from role perceptions in general practice (Mahramus, et al., 2013).

For TBI nurses, experience level of the nurse has been shown to influence judgement with TBI patients (McNett, 2009). Nurses who care for TBI patients in the intensive care unit setting are more likely to rely on another member of the healthcare team as parameters of oxygen saturation, intracranial pressure (ICP) and cerebral perfusion pressure (CPP) fall further from recommended parameters. Nursing interventions for the critically ill TBI patient include physiologic monitoring parameters, psychosocial interventions, injury prevention and therapeutic milieu provision. Many of these interventions are unique for the TBI patient as opposed to the general population (McNett & Gianakis, 2010). There is a gap in the literature related to post-traumatic resuscitation of the TBI patient. Most of the literature supports resuscitation interventions during the trauma or during intensive care and not during recovery or rehabilitation.

Training in Preparation for In-hospital Resuscitation

Sak-Dunkosky et al. (2014) indicates that a primary area that impacts perceptions of nurses and resuscitation is ACLS training and the experience of greater than ten resuscitation events. The finding is supported by Roh, Issenberg, Chung, Kim, and Lim, (2013). Authors

indicate that effective training is the highest rated factor impacting perceptions of nurses about their competence during resuscitation. Other factors include work duration, exposure to simulation-based training, and recent resuscitation experience. Authors recommended a simulation-based resuscitation training curriculum with cardiac arrest scenarios and a strong emphasis on CPR technical and non-technical skills to supplement real resuscitation experiences. Wehbe-Janek (2012) report the positive impact of simulation education based programs on perceptions of resuscitation events. Roh et al., (2003) cite that in addition to technical skills which include chest compressions, airway management and medication administration, non-technical skills such as effective communication, decision making, leadership, task management, and monitoring are important for safe and efficient patient resuscitation. Hamilton (2005) found that training should be based on in-hospital simulated scenarios and evidence based practice guidelines specific to the institution. Nurses who work in areas that rarely experience cardiac arrest should be trained on automated defibrillators and manikins with enough frequency for retention of skills. Video self-instruction was also reported to be helpful (Hamilton, 2005).

Gesensway (2009) reports problems with in-hospital cardiac arrests related to lack of routine training and experience received by emergency workers. Clinicians are frequently “paralyzed with fear” and spend too much time checking for pulses, setting up equipment or focusing on ventilations when compressions should to be prioritized.

Hui, Low and Lee (2011) conducted a study related to nurse perceptions of potential constraints and anticipated support to practicing defibrillation. Important factors identified included the need for communication amongst team members. Barriers included fading memory of skills due to lack of practice and role confusion, especially of newer nurses. While charge nurses or managers usually assigned tasks during a nurse-led resuscitation, anxiety arose related

to role confusion, fear of making mistakes, lack of confidence and lack of practice. Practice mock-code simulations were effective in increasing confidence for nurses and unlicensed assistive personnel at a long-term acute care facility (Castro, Cruz & Briones, 2014).

Gallagher and McGovern (2008) report deficiencies in healthcare professional's knowledge of in-hospital resuscitation ethics and outcomes, which compromise the integrity of resuscitation decisions. Holcomb (2002) recommends specific training with healthcare providers on leadership, documentation, and CPR skills at a frequency of quarterly to monthly.

Project Plan and Evaluation

Market Risk/Analysis

There were no major market risks or obstacles to completing this DNP capstone project. The nurse researcher identified no conflicts of interest. Participants received informed consent to participate in phenomenological interviews and privacy was protected. Participant information was not endangered and participants were not harmed or at risk in any identifiable way.

Project Strengths Weaknesses Opportunities and Threats (SWOT)

Strengths, weaknesses, opportunities and threats (SWOT) identified in the market analysis included convenient access to the specific population, and a culture of inquiry, support, professional growth, and need for evidence-based practice. The organization and administration support collaboration and education through simulation. In fact, a brand new state of the art simulation lab was recently completed, which includes two simulated hospital rooms, a large educator control room and a new high fidelity manikin and scenario video recording software and equipment. Evidence lending to specific information for simulated scenarios is a strength for the organization. A strong shared-governance structure supports new policies, procedures and education programs through staff-driven initiatives.

Weaknesses of the DNP capstone project include the limited scope and applicability of the project, limited participation, and timeframe. A resuscitation event had not occurred within the past year at the facility when data collection began. Nurses express the need for resuscitation education; however limited experiences exist at the facility. The project represents worst-case scenarios, which are not the norm.

Opportunities of the project are the gaining of information and understanding of education needs for nurses during high-risk, low-volume events. The information gathered will improve policies, procedures, and education programs which have the potential to improve outcomes for the SCI and TBI populations.

Threats to the study included poor participation; non-participation and gathering the wrong participants who would not be able to provide the rich qualitative data needed to inform the study. Participant selection needed to occur carefully to be sure the data was significant to enhance policies, procedures, and educational programs. Potential strengths and opportunities presented by the study outweighed the weaknesses, risks, and threats presented.

Driving Forces/Restraining Forces

Driving forces existed for the project. The hospital is highly motivated to provide quality care and reduce adverse outcomes for the SCI and TBI patients. Another driving force was the lack of a formal debriefing process following resuscitation events. Nurses were motivated to describe their experiences with these types of events to help others learn. At this hospital, BLS and CPR certification are required every two years and ACLS certification is strongly encouraged every two years, but was not allowed for new graduate nurses at the time of data collection. Some nurses express fear or motivation about participating in ACLS certification classes. BLS is offered via a simulated and self-directed program. The failure rate for the BLS

simulated course is high due to the physical demand of correctly performing adequate compressions and ventilations to pass the test. A driving force for the project is the “need to know” more about resuscitation of SCI and TBI patients by the nursing staff.

Restraining forces hindering the project were the time commitment needed from participants and the researcher for the interviews and need for privacy of participants. The interviews were voluntary and uncompensated. Nurses and the researcher needed 45 minutes to an hour uninterrupted for each interview. In order to compensate for restraining forces, the nurse researcher offered interviews at times that were convenient for the participant. Verbal and written assurance for anonymity was assured.

Need, Resources and Sustainability

The need for the project was to explore, describe, understand and share the perceptions of nurses who participate in resuscitations of TBI and SCI patients. Participants lent information that is used to enhance and strengthen policies, procedures, and education programs including simulation scenarios.

Resources needed for the project included the researcher’s time to conduct the study, and transcribe and code data for themes. Time was also needed from participants to be interviewed. Equipment was needed for the project. A digital tape recorder, a backup recording device and lock cabinet were needed. The institution required no monetary expenditure. Personnel involved were the nurse researcher, capstone chair, project mentor and the participants.

Sustainability of the project was achieved through the following steps:

1. Findings of the study will be shared with nurses and nurse leaders.
2. Changes based on the findings will be implemented including policies, procedures, support programs and education programs including simulations.

3. Processes supporting resuscitation education including the use of simulation will be enhanced and supplemented based upon findings.

Feasibility/Risks/Unintended Consequences

Feasibility was determined by acceptance of exempt status by the Regis institutional review board (IRB) and ready participation by eight participants . The institution required that all research be approved by a “Research Taskforce” consisting of doctoral members of the research department staff, members of the hospital medical staff and clinical department supervisors or directors as well as the president of the hospital. The taskforce reviewed all research proposal materials and the IRB approval from Regis University and voted affirmatively that the research study should take place. The vote occurred in October of 2015. A formal letter was received from the taskforce on January 1st, 2015. I identified the sample of nurses who had played an active role in a patient resuscitation through a call for participants by email and conducted face-to-face recorded interviews with them in January 2016.

I transcribed coded and developed themes from the data identifying the perceptions of nurses participating in resuscitation of a TBI or SCI patient in March of 2016. The final report was completed in April of 2016. The nurse researcher anticipated no unintended risks or consequences and continued to monitor the project through the duration of research and implementation.

Stakeholders and Project Team

The resource team consisted of the nurse researcher and the capstone chair. Consultants consisted of the clinical mentor. Stakeholders included staff nurses, leaders and nurse educators at the facility, rehabilitation nursing and non-critical care nursing as a profession, TBI and SCI patients or consumers, and SCI and TBI nurse educators outside of the facility.

Cost-Benefit Analysis

There were no identified expenditures to the participants of the study. There was however, the cost of participant's time to participate in face-to-face interviews and for gas to and from the interview location. Costs to the nurse researcher were the digital recording devices which cost \$100.00; transcriptionist services which cost \$600; and a storage cabinet which cost \$50. Interviews were conducted at the most convenient times for participants. Additional costs for study replication include a consultation fee of the researcher at \$50/hour and NVivo software at \$200. Benefits of the study include nurses and nurse educators gaining information and understanding of the perspectives of nurses during resuscitation of a TBI or SCI patient to enhance policies, procedures, and educational programs including simulated mock-code programs, formal debrief processes and identification of emotional support needs, peer support needs and stress coping mechanism needs.

Mission/Vision Statement

The mission was to provide evidence-based education, policies, procedures and support for nurses caring for SCI and TBI patients who need resuscitation. The vision was to explore nurses' experience of in-hospital resuscitation of TBI or SCI patients at a specialty rehabilitation center in order to develop educational programs for nurses.

Project Outcome/Objectives

The objectives and timeline of the study were as follows:

- The nurse researcher met requirements for protection of human subjects through exempt IRB approval granted August 25th, 2015. Institution-specific permission through the research taskforce was granted in October of 2015. A formal letter from institution was granted in January of 2016.

- The nurse researcher identified the sample of nurses who participated in resuscitation with a TBI or SCI patient within the past 10 years through a call for participants through email in January of 2016.
- The nurse researcher conducted face-to-face recorded interviews of the participants which were completed in early February of 2016.
- The nurse researcher transcribed, coded and developed themes from the data identifying the perceptions of nurses participating in resuscitation of a TBI or SCI patient in March of 2016.
- The nurse researcher completed the final report and oral defense on April 22, 2016.

Logic Model

According to (Zaccagnini & White, 2011), a logic model is a systematic and visual way to present and share understanding of the resources available to produce the DNP project, the plan to present project information, and the short and long-term outcomes and impact the nurse-researcher anticipates.

Evaluation Plan and Logic Model					
Input	Activities	Output	Short-Term	Long-Term	Impact
Nurses selected to participate who are presently employed by the hospital. Recording equipment. The nurse researcher.	The nurse researcher conducted one-to-one interviews with the participants.	Common themes emerged as participants share perceptions of a common experience. Participants share personal insight into the experience of in-hospital resuscitation	Nurse Educators understand what is needed for immediate education. Nurses understand what it is like to go through in-hospital resuscitation of an SCI or TBI patient.	Policy change; process changes; long term education and support solutions at a consistent frequency.	Improved outcomes for SCI and TBI patients during and after in-hospital resuscitation. Increased confidence of nurses who face resuscitation of an SCI or TBI patient.

		of an SCI or TBI patient.			
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Appropriate for Objectives and Research Design

The study used a qualitative phenomenological design to gather perceptions of registered nurses who verbally validated that they had actively participated in an in-hospital patient resuscitation of an SCI or TBI patient. “Actively participated” was defined as undertaking a role of CPR such as external cardiac compressions, assisted ventilation, defibrillation, or role of ACLS such as prepared or retrieved medications, administered IV fluids, started an IV or intraosseous (IO) device for medications, documented, consoled family, led the event, called the physician for orders or was the primary nurse of the patient or the charge nurse or manager responsible during the resuscitation.

The phenomenological approach was chosen to direct this study and underpins the research method as it is appropriate to describe and explain the experience of nurses who have already been through an event. Phenomenology is the study of a phenomenon through inquiry about the way “things” appear. Phenomenology was first described by Husserl (1993) who emphasized that phenomenology is the description of human experiences that are common to all persons who study the same phenomena (Ranse & Arbon, 2008). Heidegger (1993) a student and critic of Husserl reinterpreted phenomenology as hermeneutic (interpretive) which not only describes the phenomena (knowing), but also interprets the findings (understanding). Gadamer (1990) took Heidegger’s work a step further proposing that it is impossible to remove conscious thought from the researcher’s mind, yet that the historical knowledge of the situation lends itself positively to the interpretation of findings in understanding the phenomena. Gadamer (1975) posits that hermeneutic (interpretive) phenomenology is to reflect upon the ability to understand as well as the knowledge on which it is based (Fleming, Gaidys, & Robb, 2003). The nurse

researcher of this study has taken an active role in a resuscitation of an SCI or TBI patient.

Gadamer's theory would support the study since the nurse researcher has historical perspective that impacts the results.

Population Sampling Parameters

A purposive sampling of nurses and nurse managers was chosen based upon ability to provide a robust historical perspective of resuscitation of SCI or TBI patients. They were Registered Nurses in good standing who verbally validated they had actively participated in a resuscitation with an SCI or TBI patient while working at the specialty rehabilitation setting. Participants could be be culturally diverse, male or female, and age 18 or above. Exclusion criteria included non-nurses, or nurses who had participated in patient resuscitations outside of the specialty hospital.

Appropriateness of the Setting for EBP Project

The setting of a specialty rehabilitation hospital that cares for SCI and TBI patients is appropriate for project. The facility is also categorized as a teaching hospital and is dedicated to expanding education resources for staff. The facility is appropriate for providing one-on-one, face-to-face interviews.

EBP Design Methodology

The research design used was the qualitative phenomenological interpretive methodology. According to Gadamer (1990), the relationship between questioning and understanding gives form to the hermeneutic (interpretive) experience and research. The nurse researcher explored through open-ended, but focused dialogue, the nurses' perspectives of resuscitation of SCI or TBI patients. Phenomenological methodologies yield rich, varied and textured words from participants, which informed the study (Fleming, Gaidys & Robb). Five

main research questions were proposed during each interview. The researcher provided a comfortable and welcoming environment, while listening attentively but in a consciously unbiased manner. Based upon the responses of the participant, the nurse researcher probed further with encouraging dialogue such as “can you tell me more about that?” or “can you give an example?”

Protection of Human Rights

The study proceeded with the approval of the institutional review board and CITI training by the nurse researcher. Participants were assured of confidentiality and anonymity and were offered a private location for the interviews for confidentiality. Participating had no impact on employment at the hospital. Informed consent was signed prior to participating and participants were notified of their ability to withdrawal from the study at any time for any reason with no risk incurred. All data was digitally recorded and transcribed and de-identified. At the conclusion of the study the data will be erased, overwritten and destroyed after a three year period as specified by law.

Trustworthiness

According to Lincoln and Guba (1985) issues of trustworthiness must be addressed in four areas: credibility, transferability, dependability and conformability. To be sure the study is credible, the guidance of the capstone mentor and chair was sought through peer debriefing. Peer reviewers are experienced doctoral prepared nurses who review the research process and results. They provided observations, suggestions and questions throughout the study. According to Fleming, Gaidys, and Robb (2003) the nurse researcher must keep themselves and the participants oriented to the subject under study in order to continue asking relevant questions throughout the research process. Fleming, Gaidys and Robb (2003) require nurse researchers to

explore their own opinions, bias and historical perspectives prior to the research being done and during the process. Authors indicate that conversations with colleagues and a journal throughout the research process will help the researcher stay oriented to the topic.

This nurse researcher formally dialogued with fellow nurse educators about resuscitation of an SCI or TBI patient and journaled after each interview to set aside bias. The analysis was provided in the research report. Fleming et al. (2003) indicates that the historical perspective of the researcher will transform throughout the interviews. Field notes were also kept not only about the conversations, but also about the non-verbal cues which may indicate emotions (Fleming et al., 2003).

To achieve the other areas of trustworthiness a complete auditing trail including field notes and data analysis information were kept in a password-protected file. The information that provides a “paper trail” could provide other researchers with the ability to transfer the conclusions of this inquiry to other cases or to repeat as closely as possible the procedures of the project. The audit trail also includes the reflexive journal and extensive field notes to establish rigor (Lincoln & Guba, 1985).

Data Collection and Study Protocol

Data collection was conducted with semi-structured, digitally recorded, individual, face-to-face phenomenological interpretive interviews conducted by the primary investigator. Demographic information was also gathered including: gender, approximate number of years spent in nursing and rehabilitation nursing, whether the participant was a manager or staff nurse at the time of resuscitation, approximate length of time since the last resuscitation event and whether the resuscitation was with a TBI or SCI patient. Final interviews were 40-65 minutes in duration.

The questions were:

1. What was your perception of participating in resuscitation for a TBI or SCI patient? Describe the experience? Who was present? What happened? What was your role?
2. What effect did the patient's spinal cord injury or traumatic brain injury have on your participation in the resuscitation? Describe how you were prepared for this experience.
3. What were your feelings and emotions in participating in resuscitation for an SCI or TBI patient?
4. What would you have wanted to know more about in the resuscitation of an SCI or TBI patient?

The data collection tool is replicated in *Appendix B*. Each interview was transcribed verbatim and coded, then analyzed for themes using constant comparative analysis.

Findings

The final study sample was composed of eight female rehabilitation nurses over the age of 18. Nurses readily volunteered and data saturation occurred easily. Levels of experience ranged from 5.5 years to 14 years as an RN with a mean of 9.6 years. Length of total time in rehabilitation nursing, including time spent as an unlicensed care provider of SCI/TBI patients, ranged from 6.5 years to 18 years with a mean of 9.8 years. Four of the nurses were staff nurses and four were in a leadership or management position at the time of the resuscitations. Six of the participants described experiences with SCI patients, and two with TBI patients. Some participants referred to multiple resuscitation events. Three of the experiences described by different participants were of the same event. One of the events occurred eight years prior to data collection and two of the events occurred within two years of data collection.

Participants were interviewed about their perceptions of resuscitation with TBI or SCI patients. Three major themes with subthemes emerged from the data that included; *Calling Code*

Blue, Code Blue Event, and Debrief. Subthemes from each theme are presented as they were revealed from the interviews.

Calling Code Blue

A major theme of the study emerged as the participants described *Calling Code Blue*. The process of initiating an emergency response system was described. An emergency STAT is called with any kind of emergency at the facility. A “code blue” is called when the patient is pulseless. The difference between the emergency STAT and the code blue is the level of response. An emergency STAT call elicits the response of rehab hospital clinicians including nurses, nurse leaders, physicians and respiratory therapists. A code blue call elicits the response of all of the above and the neighboring hospital code team made up of RNs who have specialty training in the intensive care/critical care setting. Interview participants reported recognizing the need to call a code blue and then acting in a manner to resuscitate the patient.

History and Presentation

A subtheme that emerged under *Calling Code Blue* was the nurses’ need to quickly recognize *History and Presentation* of patients that required resuscitation. The nurses had to distinguish signs of cardiac arrest and connect them to the patient’s history as part of the process of calling a code blue. Reasons for cardiac arrest were different for TBI and SCI patients. The main reasons for calling a code blue for TBI patients were cardiac and respiratory related. One participant said “I just assumed he was having a massive arrest and because of his cardiac history.” Another nurse reported a patient’s respiratory problems; “She had a compromised airway [and] tracheal stenosis.” Yet another nurse described a TBI patient as having “a cardiac arrest and had fallen and hit his head and so were treating his TBI.”

For SCI patients the causes of cardiac arrest were mainly related to pulmonary emboli (PE). A participant stated "...her left leg was hugely edematous and she had a history of PEs, she'd thrown a couple of PEs previously and...she was on birth control and...she was overweight." Another nurse identified a respiratory cause for an SCI patient and stated "He was a vented patient, A C-1 (cervical level 1) complete and we lost his airway." In some cases with SCI patients the cause was not clear. One participant noted that "We were all trying 'What's wrong? What's going on?' He ended up having a perforated bowel...he went downhill fast.... [he] would not have been able to tell someone that [he] was having abdominal pain."

The participants described the presentation of arrest symptoms as sudden without warning and with little time to prepare. A nurse described the presentation of PE as "There was not a slow decompensation obviously being that it was a PE. It was sudden and massive." Another nurse described how a patient was being moved around during a bed bath and "...the patient was chatting and she was just fine, and then all of a sudden apparently she sort of said something to the effect of 'I don't feel well' or 'something feels wrong' and she sat up and gasped." Another nurse reported "It was very fast. Somebody was fine just a little while ago but they weren't in a short amount of time." Yet another nurse said "I was standing there...saying hi to him when it happened." A nurse expressed shock at the sudden change of the patients' status by saying "When I walked in, because I had been with him for like an hour. He was my patient and I had been there...three minutes before. It was like what the heck happened when I walked in?"

Staff Reactions

The participants in the study identified *Staff Reactions* as an important subtheme under the experience of calling a code blue. The act of calling the code resulted in a variety of

Staff Reactions. A common reported response was that once a call went out crowds of staff arrived at the scene. A nurse stated “We have 50 people arriving at the door who are ready to shock and attach the pads.” Other participants stated “Everyone wants to be in, you know ... everyone kind of wants to help, because we are rehab people we want to help or like fix stuff right.” “It is hard when you’ve got three docs or probably by then ... five, there had to be fifty people standing there discussing what was going on, you know you can hear people suggesting things.” Yet another said “I mean it’s just like every single person in this building all of whom have knowledge on what to do in an emergency but it just makes it such a mess.” A nurse summed up the responses by saying “...it just seems like too many people respond...everything seemed a little jumbled because there were too many people.”

Individual responses by the nurses to calling code blue also varied. Some of the nurses had a panicked response. A participant described a nurse “Screaming down the hall. ‘He’s unresponsive I need the crash cart.’” A nurse described “Two staff were in the room and were just going crazy- [they] forgot basic CPR.” Another said “They [the nurses] were doing compressions on a person who was completely pulseless, sitting up at 90 degrees in her bed. [The nurses were] just screaming and panicking.” Another described the scene as “I felt like there was a lot of kind of shouting and I don’t know...it was pretty loud and kind of hectic.” A participant shared how the reactions of some influenced the responses of others when the code blue was called. The nurse stated “People feed off each other. So it always starts out based on who’s starting it. I mean if we have a nurse that’s crazy and starting it out crazy, it’s going to take longer to get it under control. “

Other nurses were described as more muted and controlled in their response to the code blue. One participant stated “It was like looking at a task...performing those tasks and ...I don’t

know, like [being] on auto pilot.” Another person said I’m always a little scared, but if you focus on the task at hand...it is important to pick a task that you know you’re going to be pretty good at. You know you don’t want to fumble. ” Yet another said “It was scary. It was my first time as a manger and as a nurse having to resuscitate a patient.” A nurse stated “I have always been one of those people that even if I’m screaming inside. I can hold it together and be very calm and organized on the outside.”

Some nurses felt overwhelmed by being involved in the code blue event. This was particularly true of the primary nurse assigned to the patient. A nurse stated “I think it was a pretty intense situation and I don’t know why, but she [primary nurse] just stood to the side. I don’t know if she felt responsible.” It was also noted that sometimes the primary nurse left the room. A participant noted “I’m pretty sure she left right away.” Another participant described the action of the primary nurse “...the [primary] nurse was at the door and another was out in the hall.” Yet another noted “I went and found the primary nurse for the information but she was just a little too scared in that situation.”

Code Blue Event

Another important theme that emerged from the participants words was the actual experience of the *Code Blue Event*. Under this theme the participants described in detail what it was like to actually experience a code blue event. Under this theme were three subthemes: *Shifting Leadership*; *Shifting Roles*; and *Challenges*.

Shifting Leadership

Participants reported that the role of leader shifted between nurses, doctors and the neighboring hospital code blue team. The participants described nurses taking the lead initially when the code blue was called. A nurse stated “I was the leader in the sense that I came in and

said call a code blue and then made sure people were switching off on CPR.” One nurse said “...there are people [nurses] that just literally come in the room and they push their way to the front and they take charge...and they do know what they’re doing and they just do it.”

Many nurses found themselves in a position to have to take charge. A nurse stated “I just take the lead and make sure we have the ZOLL and that we’re monitoring them [the patient].” Another nurse stated “I just take the lead and make sure we have the defibrillator and that were monitoring the patient.” One stated “I’ve just happened to end up in the position where I’m delegating everything and taking on that leader role because we have to keep things moving.”

There was confusion about who was the leader. There was an assumption that the doctor or primary nurse would take the lead. A participant commented that “If they [primary nurses] don’t take the lead then ... it’s [the leadership role] not distinct depending on who is there.” One nurse disputed that the physician was in charge by saying “When I’m in charge, I don’t look to them [physicians] as much because I’m going to follow the protocol.”

When physicians arrived on the scene there was confusion as to who the leader was. A nurse noted that even after the physicians arrived “There was no one person who was the team leader.” Another said “You know naturally we look to those doctors to tell us what to do next.” This caused confusion as to who was in charge. A nurse said “There were multiple docs and so it just was like ‘Okay, who is in charge?’” Another nurse noted “We had multiple doctors...They were all standing at the head of the patient and discussing what they thought needed to happen.”

Some of the nurses questioned the need for physician leadership in the code blue. One nurse stated “...when there’s a doctor present it makes us question the protocols [for code blue] or we look to them because they are leaders in every other situation.” Another participant said “The physicians are not the most comfortable managing emergencies... they’re not always the

most helpful.” One participant described the physicians “conversing about what it might be and meanwhile we’re delaying treatment.” A concern by one nurse was “I don’t know if our physicians ...have BLS ...ACLS and yet you know we’re using protocols that...still require physician back-up.” A nurse summed up the feeling of the participants by stating “We don’t need all the discussion and the conflicting opinions. We need to follow our protocol because we have the protocol for a reason.”

Leadership shifted to the neighboring hospital code team when they arrived. The code team came on scene after being notified by a call from the rehabilitation hospital. A nurse described how “It was the intensivist [on the code blue team] from the neighboring hospital that came over and was at the head of the bed...and relieved some of the chaos because there was somebody ...calling the shots and running the scene.” Another nurse said “The [neighboring hospital] code team and the code nurses once they got there--I mean we kind of stepped back ... and they kind of take over and they just ask you questions.” Yet another described “...the neighboring hospital [code blue team] they took over ...they certainly calmed the environment down, removed quite a few people...I left the room.” A nurse summed up the feeling of the participants by saying “We rely most on the [neighboring hospital] code blue team because they know it [resuscitation] like the back of their hands and when they show up and take over...it sort of takes out that thinking piece for us because it’s just not second nature to any of us.”

Shifting Roles

The nurses in the study described moving into different roles as the code blue progressed. Some nurses shifted from the role of leader to other roles in the resuscitation process. They viewed their role as leader in different ways. A nurse stated “...you’re not supposed to be the leader and the compressions person but I just was for a while.” Another nurse said “I felt like I

was the...room organizer.” Yet another noted “So I guess I was the leader in a sense but not really I mean more like, overseer, because I wasn’t telling people what to do as much as I was watching what was going on making sure [it was done right].” Another nurse described her role “So it was more just like kind of help and trouble shoot than actually leading.”

The nurses also expressed struggle with taking many different roles in the resuscitation process. Sometimes roles shifted multiple times. One nurse stated “I was looking for a central line kit. Then my role kind of changed to ... notifying the family....okay [then I was told] you need to go over here and do this and [then] you need to clear out of here, we need room for these people.” Another comment highlighted the shifting roles when a nurse said “I was basically the support nurse. You know ...I wasn’t the nurse that was in charge of the code, so I took turns like doing compressions and gathering drugs.” Yet another participant stated “His [the patient’s] nurse and I were the first responders, she started getting vital signs immediately and I started to record and then I was relieved of that responsibility when administration came in.”

Inter-professional roles during the code blue event were also described by the participants. Interactions of the nurses with different professionals occurred randomly as different professionals arrived at the code blue and assumed different duties. Major nursing responsibilities included getting IV access and inserting the interosseous (IO). A participant described “...what was very hard was getting IV access; we had so many tries to get IV access.” Another nurse stated “...a nurse was doing the IO and pushing meds.” Yet another said “we quickly realized we couldn’t put the IO in the humeral head...can’t do that when you are doing compressions.” The nurses also recorded and documented the event. A nurse stated “We always have somebody who steps up to record.” Another described an incident that was unusual by saying “I asked ‘is somebody recording?’ and the nurse said ‘yes I am’ and I said ‘Great’ but she

did the entire 30 min. [code recording] on a paper towel...and then we're trying to Xerox a paper towel, that's ridiculous."

Respiratory therapy was primarily responsible for intubations. One nurse stated "You felt really helpless ... We don't intubate or work with the trachs." Another nurse stated "I've seen respiratory take over....you know ...boot somebody off ...trying to intubate... because they [the therapists] couldn't get it." Pharmacists also sometimes attended the code blue. A participant stated "Then pharmacy came which is helpful, but at the same time they don't draw up meds for you frequently ...once they're there they draw meds up and so it's kind of like a lot of people in the pot of drawing and doing meds."

The nurses described struggling with coming to terms with the shifting roles and confusion of the code blue event. A nurse stated "I felt like I was in so many roles that [this] being my first real emergency as a manger...it just was so [much] anxiety, it was really hard for me." Another nurse said "...when I came into the room...there were enough people there to do the tasks ...but it hadn't all been put together yet." Yet another said "A lot of times people fall into or just take thepositions which is fine but sometimes it just seems like it's not put together as well." A nurse summed up the majority of the participants' feeling with "I just think that designating who's doing what [is important] I know you have to keep moving and the first primary thing is the patient but it just seems like the positions [roles] aren't completely designated."

Challenges

The nurses experienced specific challenges in the resuscitation experience with SCI and TBI patients. Patient access and wheelchair setup were specific obstacles to overcome with the SCI and TBI in the code blue event. The participants described other challenges with undertaking the code blue with SBI and TBI patients. One nurse stated "...it takes forever to get

them to a point where we can move them, to some place where we can do compressions.”

Another stated “...they can’t tell you what is wrong because they either can’t feel it or they’re not cognitively intact ... or they can’t communicate...it is a challenge.” A nurse noted that “We have to be mindful of where their cervical spine is and how stable they are ...preserving not having more injury to them if it’s preventable.” A study participant described a common experience that summed up the challenges of many rehabilitation nurses;

There was a patient who was heavy set who had been injured a long time. He had a Delta Aide on his wheelchair to drive his chair. He had laterals. He had a wound vac. He had. He was post op as well. He had IV pumps. And you know just to figure out how to get him out of his chair and figure out how all that stuff detached. I mean regardless of whether or not you’re trying not to break it or not. Just to, you know get his elbow and his wrist out of the sling so that you could remove the lateral. And then there’s always this big question of how’s the best way to move him. And usually have enough people, but it’s not routine for us to power lift somebody out of a gigantic chair to a flat surface, you know?

Another major challenge was gaining access to needed medical equipment during the code blue. Certain equipment was needed immediately and was often difficult to locate. The nurses described the problem of “finding the stuff in the cart.” They gave examples of nurses being “...in a heightened crazy state ...running all over the hospital to get an IV pump when there is one sitting on the code cart.” Other types of equipment that were challenging to locate included “a backboard,” “flushes,” “central line kit,” “tongue blade,” and “a pressure bag.” The nurses sometimes found that the equipment they used was not functioning. An example was stated by one nurse who said “... once we got the IV bag connected... I think the battery was

dead on the IV pump and so that's why ... he [a code team member] came in and started manually infusing it.” Another example of difficulties with equipment was shared by a nurse who said “...when we place the ZOLL pads... they weren't connected and when we did connect them we connected them backwards.”

The nurses also described challenges with finding needed drugs during the code blue. A participant stated “They asked for Propofol...I think we ended up getting Ativan” Another nurse said “I think we got epi out of another cart even though we should have enough epis in the [original] cart.”

The nurses described how they addressed communication challenges during the code blue. One nurse said “I think closed loop communication is one of the most important things that you can do in a code or any emergency.” Another nurse said “I looked up ...saw a nurse leader looking at me and I caught her eye and I said I needed her and pointed at her and she came over and helped me.”

A common difficulty for the nurses was maneuvering patients during the code blue in the small space of the patients' rooms with the medical equipment and the large number of people. A nurse described the scene as “There was ...an inability to make the appropriate space to really...in an organized, calm fashion run the code...there were people literally standing in the window sill because that was the only place to be.” Another nurse stated “I mean it was the physical environment was just really really tight to be running a STAT.”

The nurses described adjusting to the small space by saying “...nurses tend to be more flexible in those situations...there's kind of that 'Mcgyvering' that happens in those moments.” They also described dealing with the large number of people by saying “I remember a nurse was kind of playing crowd control and we got a lot of people out of there which was good.”

Another said “There was an amazing body guard [nurse] she was keeping people from coming in ... she was keeping people from... just wandering off ...[and keeping them] if we needed them on standby in the hall.”

Another important challenge was dealing with roommates and family in the room where the code blue took place. A participant said “There was no one here to help with the family and his dad was like screaming at us ... ’save him’.” Another said “I know she [wife of the patient] was confused in knowing what was going on and she needed somebody to tell her...its part of leadership to help support the family.” In some cases the roommate of the patient experiencing the code blue was unable to be removed from the situation. A nurse described “I heard later that the patient [the roommate] was pretty traumatized by having to listen to everything that was going on ...on the other side of the curtain.” A nurse described her feelings about the roommate being present during the code. She stated “I think that added to the ...feeling of panic because it was like someone ...like an outsider...knew what was going on.”

The nurses also describe close attachments with patients which presented a personal challenge when a patient they cared for had a code blue. A nurse stated “This was my patient, who I know very well medically, but know particularly well personally ... all that sort of details that our staff knows about the patients that they get really close with which then of course, makes running a code on that person, infinitely harder.” Another nurse said “when you have the patient....and you’ve had them over and over and you have like a personal attachment to them...that’s a lot harder [in a code blue] .”

Debrief

The final theme that emerged was the *Debrief* that resulted after the code blue. The *Debrief* involved thinking back about the event in a variety of ways. Reflecting back on the code

blue was sometimes accomplished by discussion with others, but mainly reflection was done alone.

Immediate Support

One of the ways that the nurses experienced debrief was through immediate discussion of what happened in the code blue which seldom occurred. It was noted by the participants that following the event, the tendency was for the staff to go back to work caring for patients. A nurse described the scene after the code blue as” ...everybody dispersed and they [the nurses] are trying to just take care of all the stuff that they haven’t done for the last hour.” A nurse stated “people just need to talk about what happened step by step, what went well what did not go well...I think immediately.” Another said “actually talking about what we did well and what we didn’t [do well] ...yeah we fall short for sure.” Yet another said “If you don't do it [debrief], that day, the same group is never going to come back together.”

The nurses spoke of receiving emotional support through the hospital employee assistance program following the code blue. A nurse said “If somebody had a negative outcome we are good at getting the employee assistance program in here and sending people home if they can't go on.” Another nurse spoke of nurses “....trying to give them [nurses in the code blue] what they need, even if that's just letting them leave the unit for 30 minutes and covering their team.”

Solitary Reflection

The major debrief surrounding the events of the code blue happened for the nurses through solitary reflection most of it at home away from the hospital. A nurse said “I have always sort of hidden my emotions until I’m like home or by myself.” Strong emotions were released after reflection. A nurse stated “It’s like I wasn’t really feeling very much but

afterwards that's when the whole wave of it or the reality of it...hits you." Another said "I was just really sad ...the chaplain called me the next day and I finally cried for a long time with her and she was 'Is everything ok?' and I couldn't even talk...and that one was just really hard."

Many of the nurses began to think what they could have done differently that would have changed the course of the event. One nurse stated "After [the code blue]? I'm kind of just like sad frustrated angry that it even happened and then ...like my mind goes to...how could we have prevented this?" Another said "But in the days that pass ...when you're thinking of what you could have done different or in what order and you start examining everything and thinking about your skills level if you could have done something better or different."

Root Cause Analysis

The *Debrief* also included a review by the leadership team. A root cause analysis (RCA) took place with each event, but nurses who were at the event were not always present. "We do our RCAs on the big ones. Um, and we just don't have great participation from the people that were present. So it ends up to be leadership doing an RCA." Another nurse described her desire to know what happened in the RCA. She stated "I think [issues] can be answered in those meetings afterwards [RCAs] where people look at, um, how things happened and how to make things better."

Discussion

This study revealed how eight nurses who work in a specialty rehabilitation hospital perceived resuscitation events with traumatic brain (TBI) and spinal cord injured (SCI) patients. Important finding of the study were the nurses' awareness of the history and presentation of patients that required calling a code blue. Boehm (2006) stressed the best practice of identifying signs and symptoms of patient deterioration and seeking help prior to patients going into cardiac

arrest. SCI patients were found to have primarily cardiac and respiratory causes for the need for resuscitation. The nurses in the study identified a patient with an “edematous leg” “history of PEs” “over-weight” and on “birth control” who arrested from a pulmonary embolism (PE). Casha and Christie (2011) confirmed that SCI patients often present with cardiac arrest, pulmonary emboli, and respiratory complications. Mowrey (2007) also noted that SCI patients mask symptoms related to perforated bowel and other conditions which were reported by participants in the study. Stein, McArthur, Etchepare, and Vespa (2012) found that the initial resuscitation from TBI had an effect on the six month outcome but did not discuss antecedents for subsequent arrests. TBI patients in this study arrested related to cardiac complications and airway/respiratory causes. Haddad and Arbi (2012) describe the main objectives for management of TBI patients as prevention and treatment of intracranial hypertension and secondary brain insults, preservation of cerebral perfusion pressure (CPP), and optimization of cerebral oxygenation. Alterations in these signs could signal patient decline.

The nurses in this study were shocked at the speed with which patients’ status changed requiring the need to call a code blue. They described the patients as “chatting and just fine” or “I had been there ...3 minutes before” just before they arrested. Jones, Mitchell, Hillman and Story (2013) report that clear clinical signs leading to cardiac arrest were present up to several hours before in 84% of patients. However, authors also suggest that significant underlying chronic health issues and co-morbidities can distort signs and symptoms of clinical deterioration prior to cardiac arrest. Catastrophic SCI and TBI significantly alter baseline vital sign stability making it difficult to assess clinical deterioration (McNett & Gianakis, 2010; Caruso, Carter, Cifu & Carne, 2014). Pulmonary emboli (PE) are well documented in the literature as sudden and are a common cause of fatal cardiac arrest (Tadlock et al., 2015). The literature notes that

SCI patients are at high risk for sudden, unexpected and fatal PE during rehabilitation (Kovindha & Kammuang-lue, 2014). One TBI nurse noticed “behavioral issues” the evening of the arrest. Schein et al. (1990) confirmed that mental status changes might be noted prior to cardiac arrest.

The nurses in the study understood the importance of starting immediate compressions and preparing for defibrillation following cardiac arrest. Ranse and Arbon (2008) supported the need for nurses to quickly recognize patients in need of emergency intervention when activating the emergency response system. Jackson and Grugan (2015) stated that “a code blue in adults should be called immediately for any patient who is unresponsive, apneic, and/or pulseless and that all staff should be aware of the facility policy on calling a code blue” (p. 36). Boehm (2015) identified that the ability to resuscitate a patient rests with 3 major actions; prompt recognition of the arrest and calling for help, immediate CPR by first responders, and early defibrillation. The patient should be assessed for “Airway-Breathing-Circulation” with the goal of beginning chest compression within 1 minute of the patient collapse (American Heart Association, 2005). An addition to the mnemonic after the basic assessment of ABC is “D” or Disability: Neurological Status which would include a rapid neurological assessment that would be appropriate in the rehabilitation setting. Patients should be evaluated for level of consciousness, pupil size symmetry and reaction, lateralizing signs, and level of spinal cord injury (Kool & Blickman, 2007). Mellick and Adams (2009) noted that the quality and speed of care delivered during the resuscitation process make a significant difference in patient outcome.

When calling a code blue the participants also described a variety of staff reactions that impacted the course of the resuscitation. A major finding was the crowds of staff that responded to the resuscitation scene. The nurses described “50 people arriving at the door,” “everyone kind of wants to help,” and “too many people respond.” The large number of people created problems

with space, and ability to communicate effectively during the resuscitation. Crowding around the bedside of resuscitation patients is noted prominently in the literature (Dorney, 2011; Prince, Hines, Po-Huang & Heegamn, 2014). O'Donoghue (2015) reported that too many responders at the bedside inhibited patient resuscitation and team dynamics.

Some of the nurses in the study panicked when the code blue was called. Nurses were described as “screaming down the hall,” “just going crazy,” and “screaming and panicking.” Ranse and Arbon (2008) found that nurses who experienced a resuscitation event for the first time often have a “fight or flight” response (p. 43). Mellick and Adams (2009) noted that a code blue induces healthcare provider stress and may interfere with performance. The literature also noted that young inexperienced nurses with no direct experience in code blue felt high levels of anxiety during resuscitation events which can lead to ineffective resuscitation management (Attin, Yishan, Chii-Dean & Lemus, 2015). Panesar, Ignatowicz and Donaldson (2014) report lack of appropriate stress management as a key factor in a review of 29 studies of nurses in code blue events.

The participants in the study had appropriate CPR training but still experienced high levels of stress. Nurses have few opportunities to practice CPR skills before needing to perform them on a patient in crisis. The literature supports that it is difficult to remain proficient in skills and knowledge that are used infrequently (Prince, Hines, Chyou, & Hegeman, 2014).

There were also nurses who responded to the code that were calm and controlled in their response. These nurses described themselves as being on “autopilot” “screaming on the inside” but also “calm and organized on the outside.” The nurses that had a more calm approach bore the weight of responsibility in conducting the code and often were the leaders that emerged. Prince, Hines, Chyou, and Hegeman (2014) noted that non-medical skills, including communication,

leadership, team interaction and task coordination play as much of a role during a code response as medical skills such as chest compressions and early defibrillation.

Many of the primary nurses in the study were unable to take a leadership role in the code blue due to being nervous or unprepared. Primary nurses were those who were assigned to the patient at the time of the code, some of whom were new RNs or new to rehabilitation nursing. They either “stood to the side,” “left the room” or were “out in the hall.” This behavior was supported by Ranse and Arbon (2008) who noted that nurses new to high stress situations may be ill equipped to be leaders. Anxiety and lack of confidence with skills related to resuscitation were noted in first responding primary nurses in a study by Castro, Cruz and Briones (2014).

Many nurses in the study felt that the primary nurse should be the lead in the code blue because they had the most current patient information, however in many cases this did not happen. The literature stated that calling for help and initiating CPR should be done simultaneously by the primary nurse (Jackson & Grugan, 2015). Prince, Hines, Chyou and Heegeman (2014) found that in a code the patient’s primary nurse should remain in the room to provide essential information and to assist the code team if needed. Mellick and Adams (2009) confirm that well defined but integrated nursing leadership is critically important to resuscitation success.

A major finding of this study was the confusion and shifting roles of leadership during the code blue event. The nurses on the unit initially took charge calling in the code blue and “pushing their way to the front” to begin the resuscitation process. As one nurse described “they [some of the nurses] know what they’re doing and they just do it.” This process changed once the doctors and other professionals arrived on scene. Physicians did not necessarily provide leadership during the resuscitation due to the fact that they were not familiar with the code blue

protocol. The nurses noted the physicians were “not the most comfortable managing emergencies” and “not always the most helpful, sometimes even delaying code team decision-making through “discussion and conflicting opinions.”

According to Rall and Dieckmann (2005) a code blue event needs a leader who takes command, distributes tasks, and collects all information. Boehm (2006) stated that it is important that the designated leader participate in a “hands-off” manner during the resuscitation so that he/she can monitor the larger scene and guide the team (p. 5). Prince, Hines, Chyou, and Heegeman (2014) described the ideal team leader as keeping the group organized, monitoring the team’s performance, role-modeling proper team behavior, functioning as a trainer and coach, and also focusing on the patient’s care. The literature revealed different views on who should take the leadership role in an interdisciplinary code team. Mellick and Adams (2009) state that clearly defined physician leadership of one and only one physician leader at any specific time is critical to the smooth performance of the code team. Spath (2000) noted that anesthesiologist, surgeons and emergency physicians can experience barriers to team unity due to specialty rivalry, sense of entitlement or differing styles of communication.

A different approach to code team leadership was advocated by Finn, Gordon-Reznar, Gentileco, and Garner (2015) who supported a co-leadership dyad between the nurse and resident physician. In this collaborative model a nurse-co-leader utilized a “Code Blue” checklist to assign roles to team members, and take charge of completion of initial essential tasks. After the arrival of the physician leader the physician-nurse dyad worked to collaboratively deliver ACLS care according to an established algorithm.

According to the participants in the study the arrival of the code blue team from the neighboring hospital resulted in an additional shift of leadership roles. The “intensivist” or

leader of the hospital team took charge at that time and the nurses stepped back from participating in the code. The nurses described feelings of relief in handing over patient responsibility by saying "...it sort of takes out that thinking piece for us because it's just not second nature to any of us." There was the sense that the nurses lacked confidence in their skill to complete the code blue. A similar finding was noted by Ranse and Arbon (2008) who noted that the nurses in the initial code experienced a sense of relief with the arrival of the emergency response team, and that they immediately dispersed back to their units.

Literature on resuscitation supports the organization of code teams as the best way to deliver fast lifesaving interventions to critically ill patients (Sanders & Ewy, 2005). Prince, Hines, Chyou, and Heegeman (2014) stated that an effective code team must be organized, proficient in knowledge and skills, and demonstrate effective communication. According to Weinstock and Halamek (2008), a group of experts does not necessarily make a good team. Team training is necessary to establish and maintain good dynamics.

Not only did the participants share that there were shifting leadership roles during the code blue but resuscitation roles changed continuously during the course of the code as different circumstances arose. The nurses described moving from "compressions" to "gathering drugs" and then being relieved of responsibility. This made the process confusing to the participants as described by one who said "I was in so many roles...it was just [so much] anxiety." According to O'Donoghue (2015) typical nursing roles in code blue are providing compressions, defibrillation, code cart management, recording, IV/IO access and supporting family. The nurses in this study not only exchanged roles between themselves but switched roles with other professionals such as respiratory therapists and pharmacists when they arrived on the scene.

Everyone wanted to help but there was not a clear process for establishing roles during the code blue.

Several authors identified the importance of clearly delineating code team members (Prince, Hines, Chyou, & Heegeman, 2014; Mellick & Adams, 2009). Although the titles and numbers of code members differed in the literature review, Jackson and Grugan (2015) summed up the major roles in the interprofessional code blue team as: the compressor, airway manager, defibrillator manager, crash cart manager, code team leader, and the recorder. Prince, Hines, Chyou, and Heegeman (2014) described assigning a placard worn around the neck to identify code team members' roles and positions relative to the patient during the code. The placard was required for admittance into the code and was handed to team members along with a pager from shift to shift. Although the literature described a trend of dedicated in-hospital cardiac arrest teams, others addressed the idea that all staff should know how to work in core teams and be skilled in code blue teamwork behaviors (Risser, Rice, Salisbury, Simon, Jay, & Berns, 1999).

The nurses described challenges to conducting a code blue with TBI and SCI patients. Some of the major obstacles were communication with patients who often could not express what was wrong with them; the equipment associated with wheelchair setup for patients, and the necessity to move them to a place to conduct cardiac compressions. The nurses had to very quickly think through the process of what was happening to the patient and then safely get them in position to perform resuscitation. According to the literature a patient should be in a flat position with a hard surface underneath them in order to perform adequate compressions (Sinz & Navarro, 2010). In some cases the amount of time it took to move a patient with multiple assistive devices from “a gigantic [power] wheelchair” prevented beginning compressions within the recommended timeframe. Literature could not be found in relation to emergent patient access

with complex wheelchair setup. In addressing the issue of managing the airway of patients with SCI, Austin, Krishnamoorthy and Dagal (2014) noted that there was not one perfect way to manage the airway and that a provider must use judgement and weigh various risks like spinal cord injury aspiration and hypoxia in each SCI patient. They also recommended having the most experienced provider available to safely secure the airway

Other challenges faced by the nurses in the study were finding supplies and medications on the crash cart. They struggled to find important supplies such as “a backboard,” “an IV pump,” and “a central line kit.” The nurses did not appear to be familiar with the crash cart or where to find functioning equipment. They also identified challenges locating drugs that they needed. One nurse spoke of getting “epi out of another cart.” Panesar, Ignatowicz and Donaldson (2014) note that as high as four out of ten poor outcomes in cardiac arrest were related to equipment deficits, nonfunctioning equipment or the inability to locate equipment in an emergency. Jackson and Grugan (2015) state that crash carts should be consistently stocked using a code cart equipment checklist with medications located in the same location in the drawers throughout the hospital. Mellick and Adams (2009) recommend using systems for resuscitation equipment organization and display as a way to make accessing equipment more efficient. Other suggestions included cart covers that have clear doors or open equipment carts to allow for easy visibility and access of supplies.

The nurses in the study described using “closed loop communication” during the code which is a communication system that promotes error avoidance and is supported in the literature. According to Jackson and Grugan (2015) this is a system where the leader gives an order, the receiver repeats the order and then announces when the order has been carried out.

Mellick and Adams (2009) identify proper verbal and nonverbal communication as essential for effective teamwork in high intensity situations like a code blue event.

A major challenge experienced by the nurses during a code was the small space in the rooms to manage equipment and the crowds in attendance. They described doing workarounds or “Mcgyvering” when there was not sufficient space to lay out equipment. A problem noted by Prince, Hines, Chyou, and Heegeman (2014) was that ACLS courses are not held in the patient care setting so staff do not use equipment and carryout procedures specific to their workplace. To address this problem scheduled periodic mock codes were conducted in the actual units to recreate a realistic environment and identify issues with response time and equipment. Code team training programs that incorporated simulations were recommended by the Institute of Medicine report in 1999 and are supported by the AHA’s consensus statement to improve cardiac resuscitation outcomes both inside and outside the hospital setting (Hill, Dickter & Van Daalen, 2010).

Crowd control by the nurses was a necessary part of the code process to help manage the number of people. People were described as being “on the window sill.” Mellick and Adams (2009) noted that variations in room layout, location of monitors and equipment, number of personnel, available skill mix, patient size or age, and the clinical condition being treated are factors that will influence roles and team member location in the room. The literature clearly identified the need to remove unneeded people from the room either by the leader or a specific staff member with the designated role of crowd control (Prince, Hines, Chyou, & Heegeman, 2014; Jackson & Grugan, 2015) .

The nurses shared the challenge of dealing with roommates and family during the code blue. There were times in shared rooms where due to the small space and amount of equipment

and people the roommate could not exit the room. This created an uncomfortable situation for the roommate and the nurses. A nurse identified a situation where the roommate was “traumatized” by hearing what was happened during the code. There was also the challenge of families who were present during the code and extremely worried and panicked about their loved one. A father was described as yelling “save him.” Jackson and Grugan (2015) noted that the code team leader can direct other nurses to help move the patient’s roommate or check on other patients on the unit who may need assistance. Family members that are present deserve to see a highly synchronized and disciplined code blue team (Mellick & Adams, 2014).

In addition to the confusion and chaos there was also the nurses’ personal challenges of viewing patients they were close to experiencing a code blue. They stated that it was much harder to be a part of a code when they had a “personal attachment” to the patient. Resuscitations were noted in the literature to be potentially emotionally and intellectually demanding. Boehm (2006) stated the first responders at code blue often welcome the chance to discuss the events afterward and are often distraught and may feel guilty.

The final theme of debrief described the way the nurses processed the experience of the code blue. It was noted that staff were given support if they needed after the code blue. Members of the employee assistance program were available to contact and meet with staff members who experienced strong emotional reactions. In one instance a nurse was contacted at home by a chaplain. Nurses on the unit supported one another and gave nurses who were involved in the code time off the unit to decompress. The intense and serious reflection on the blue code event however, occurred for nurses at home in private. They spoke of needing to cry and think back on what could have been done differently. They dissected the events of the resuscitation and were critical of their behaviors.

There was seldom an immediate gathering of the staff involved in the code blue to look at what happened and to talk about the experience. It was normal for the staff to go back to work caring for patients. The nurses spoke about wanting immediate time to debrief and needing an opportunity to talk about what they experienced. According to the literature formal debriefing is not common in most hospitals following a code although it is recommended (Lauridsen, 2015). Critical incident debriefing following codes is recommended in the 2000 AHA Guidelines. Boehm (2006) notes that nurses must feel safe to discuss the happenings at codes in a protected environment and that the review process should be one that is supportive and educational not punitive. Code team members are the best ones to evaluate their performance at a code which should be done in a timely manner when memories are fresh. Boehm (2006) noted that code team members should be recognized when best practices are followed.

In the debrief session an important area to review is the record of the events of the code blue that must include patient demographics, length of the code, and survival status. Other important information to track to meet JCAHO standards include: time from patient collapse to initiation of compressions, time from collapse to first shock when patient is pulseless, and time from collapse to first dose of epinephrine (Boehm, 2006; Holcomb et al., 2002). This record keeping is considered the gold standard by the American Heart Association and should be complete, accurate, and legible (2005). The debrief should also include an objective review of things that went well in the code and things that could be improved. The nurses also spoke about a root cause analysis being done by the nursing leadership team. The literature supported the need for an ongoing code organization committee or similar entity to support training and continued code blue team improvement (Mellick & Adams, 2009). The leadership team root

cause analysis could contribute to this continued improvement plan. There should be a direct link between identified quality issues during resuscitation and plans for future education.

Recommendations and Limitations

The limitations of this study were that the sample of RNs was all female and drawn from a single rehabilitation hospital. A larger sample of inter-professionals of both genders in rehabilitation facilities of different sizes is needed to fully capture the experience of resuscitation in the specialty area. Another limitation of the study was the long duration since resuscitations occurred. Some of the codes took place years prior making it difficult for nurses to recall specific details. Recommendations include repeating the study with rehabilitation nurses who have experience using simulation and mock code practice to gather nurses' perceptions of these learning strategies.

Implications to Practice

The findings of this study support the need for an overall strategy for resuscitation team planning that could be implemented through a code organizational committee. This committee would oversee the development of policies related to the establishment of code blue teams in the facility. This would include decisions related to retaining the agreement with the neighboring hospital code team or organizing an independently run resuscitation team process. Shifting roles during code blue events support the need to define code team membership and outline specific responsibilities for each role. The leadership role should be clearly defined and embraced by all interprofessional team members. Standard methods of communication should be followed by all team members to prevent errors.

Nurses in the study wanted the opportunity to debrief following a code blue. Critical incident review should occur in a timely manner with staff that was involved in the resuscitation

to determine what went well and what could go better. Feedback should be supportive and not punitive. Nurses need current knowledge of the history and presentation of SCI and TBI patients to determine patients at risk for cardiac arrest. Challenges that arise in code blue events with SCI and TBI patients need to be addressed and planned for.

More education including scenario-based simulations and mock codes should focus on the responder role stressing good quality CPR and early defibrillation to give nurses more exposure to the code blue process, thereby reducing stress and increasing confidence in the process. Specific challenges to address through education include handling crowds, equipment and crash cart problems, and working with families. The study is beneficial for nurse educators and reveals focus needs for education training surrounding resuscitations with the patient populations

Conclusion

The capstone project explored nurses' perceptions of participating in resuscitation with traumatic brain and spinal cord injured patients. The results of the study provide insight into challenges nurses faced in participating in a code blue event with rehabilitation patients. These perceptions aide nurse educators and nurse leaders in modifying and developing policies, procedures, and education programs to assist the professional team in managing events that are low volume, yet extremely high risk with the potential for devastating outcomes and emotional duress.

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Appendix A

Logic Model

Evaluation Plan and Logic Model					
Input	Activities	Output	Short-Term	Long-Term	Impact
<p>Nurses selected to participate who are presently employed by the hospital.</p> <p>Recording equipment.</p> <p>The nurse researcher.</p>	<p>The nurse researcher conducted one-to-one interviews with the participants.</p>	<p>Common themes emerge as participants share perceptions of a common experience.</p> <p>Participants share personal insight into the experience of in-hospital resuscitation of an SCI or TBI patient.</p>	<p>Nurse Educators understand what is needed for immediate education.</p> <p>Nurses understand what it is like to go through in-hospital resuscitation of an SCI or TBI patient.</p>	<p>Policy change; process changes; long term education and support solutions at a consistent frequency.</p>	<p>Improved outcomes for SCI and TBI patients during and after in-hospital resuscitation.</p> <p>Increased confidence of nurses who face resuscitation of an SCI or TBI patient.</p>

Appendix B

Capstone Project Data Collection Tool

An Exploration of Nurses' Perceptions of Resuscitation of TBI/SCI patients

1. What was your perception of participating in resuscitation for a TBI or SCI patient? Describe the experience? Who was present? What happened? What was your role?
2. What effect did the patient's spinal cord injury or traumatic brain injury have on your participation in the resuscitation? Describe how you were prepared for this experience.
3. What were your feelings and emotions in participating in resuscitation for an SCI or TBI patient?
4. What would you have wanted to know more about in the resuscitation of an SCI or TBI patient?

Appendix C

DNP Capstone Project Timeline

Timeline

May 2015	PICO approved
July, 2015	Proposal approval by committee Letter of Intent to Organization
August, 2015	Regis IRB submission
September, 2015	IRB permissions completed Summary of project and IRB letter submitted to Research Taskforce at Organization
November/December 2015	Subjects contacted and interviews began.
January, 2016	Transcribe Interviews
February/March 2016	Transcriptions coded for themes
April, 2016	Data Analyzed
May, 2016	Completed project presented

Appendix D

Budget and Resources

Statement of funding- The insitution acquired no costs. All expenses were covered by the personal funds of the researcher.

Budget and Resources

Actual Expenses		Replication	
Actual Expenses	Cost	Replicated Expenses	Cost
➤ 10 one hour interviews \$00./hr	\$0.00	➤ 10 one hour interviews \$50./hr	\$500.00
➤ Digital recorder-	\$ 150.00	➤ Digital recorder-	\$ 150.00
➤ Transcriptionist-	\$ 600.00	➤ Transcriptionist-	\$ 600.00
➤ Storage Supplies	\$ 50.00	➤ Storage Supplies	\$ 50.00
Total	\$ 800.00	Total	\$1300.00

Appendix E

Regis University IRB Approval Letter



IRB – REGIS UNIVERSITY

September 1, 2015

Lisa Shelton
5332 South Robb Court
Littleton, CO 80127

RE: IRB # 15-231

Dear Ms. Shelton:

Your application to the Regis IRB for your project, “An Exploration of Nurses’ Perceptions of Resuscitation of Traumatic Brain and Spinal Cord Injured Patients”, was approved as an expedited study on August 25, 2015. It is approved per OHRP Category of Research #6 and #7.

If changes are made in the research plan that significantly alter the involvement of human subjects from that which was approved in the named application, the new research plan must be resubmitted to the Regis IRB for approval. Projects which continue beyond one year from their starting date require IRB continuation review. The continuation should be requested 30 days prior to the one year anniversary date of the approved project’s start date. A completion report of the findings of this study should be sent to the IRB.

In addition, it is the responsibility of the principal investigator to promptly report to the IRB any injuries to human subjects and/or any unanticipated problems within the scope of the approved research which may pose risks to human subjects. Lastly, a final report should be submitted at completion of the project and it is the responsibility of the investigator to maintain signed consent documents for a period of three years after the conclusion of the research.

Sincerely,

Patsy McGuire Cullen, PhD, CPNP-PC
Chair, Institutional Review Board
Professor & Director
Doctor of Nursing Practice & Nurse Practitioner Programs
Loretto Heights School of Nursing
Regis University

cc: Dr. Pamela Stoeckel



Appendix F

CITI Training Certificates

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM) COURSEWORK REQUIREMENTS REPORT*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details.

See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Lisa Shelton (ID: 2872711)
- **Email:** lshelton@craighospital.org
- **Institution Affiliation:** Regis University (ID: 745)
- **Institution Unit:** Nursing
- **Phone:** 303-789-8572
- **Curriculum Group:** The RCR for Social & Behavioral
- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 1 - RCR
- **Description:** This course is for investigators, staff and students with an interest or focus in **Social and Behavioral** research. This course contains text, embedded case studies AND quizzes.
- **Report ID:** 16495627
- **Completion Date:** 07/12/2015
- **Expiration Date:** 07/11/2018
- **Minimum Passing:** 80
- **Reported Score*:** 100

REQUIRED AND ELECTIVE MODULES ONLY DATE COMPLETED

- Authorship (RCR-Refresher) (ID:15661) 07/12/15
- Collaborative Research (RCR-Refresher) (ID:15662) 07/12/15
- Conflicts of Interest (RCR-Refresher) (ID:15663) 07/12/15
- Data Management (RCR-Refresher) (ID:15664) 07/12/15
- Peer Review (RCR-Refresher) (ID:15665) 07/12/15
- Research Misconduct (RCR-Refresher) (ID:15666) 07/12/15
- Mentoring (RCR-Refresher) (ID:15667) 07/12/15
- Research Involving Human Subjects (RCR-Refresher) (ID:15668) 07/12/15
- Using Animal Subjects in Research (RCR-Refresher) (ID:15669) 07/12/15

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution

identified above or have been a paid Independent Learner.

CITI Program

Email: citisupport@miami.edu

Phone: 305-243-7970

Web: <https://www.citiprogram.org>

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM) COURSEWORK TRANSCRIPT REPORT**

** NOTE: Scores on this Transcript Report reflect the most current quiz completions, including quizzes on optional (supplemental) elements of the course. See list below for details. See separate Requirements Report for the reported scores at the time all requirements for the course were met.

- **Name:** Lisa Shelton (ID: 2872711)
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- **Course Learner Group:** Same as Curriculum Group
- **Stage:** Stage 1 - RCR
- **Description:** This course is for investigators, staff and students with an interest or focus in **Social and Behavioral** research. This course contains text, embedded case studies AND quizzes.
- **Report ID:** 16495627
- **Report Date:** 08/10/2015
- **Current Score**:** 100

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES MOST RECENT

- Authorship (RCR-Refresher) (ID:15661) 07/12/15
- Collaborative Research (RCR-Refresher) (ID:15662) 07/12/15
- Conflicts of Interest (RCR-Refresher) (ID:15663) 07/12/15
- Data Management (RCR-Refresher) (ID:15664) 07/12/15
- Peer Review (RCR-Refresher) (ID:15665) 07/12/15

Research Misconduct (RCR-Refresher) (ID:15666) 07/12/15
 Mentoring (RCR-Refresher) (ID:15667) 07/12/15
 Research Involving Human Subjects (RCR-Refresher) (ID:15668) 07/12/15
 Using Animal Subjects in Research (RCR-Refresher) (ID:15669) 07/12/15

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COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COURSEWORK REQUIREMENTS REPORT*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details.

See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Lisa Shelton (ID: 2872711)
- **Email:** lshelton@craighospital.org
- **Institution Affiliation:** Regis University (ID: 745)
- **Institution Unit:** Nursing
- **Phone:** 303-789-8572
- **Curriculum Group:** CITI Conflicts of Interest
- **Course Learner Group:** Conflicts of Interest
- **Stage:** Stage 1 - Stage 1
- **Report ID:** 8854996
- **Completion Date:** 09/26/2012
- **Expiration Date:** 09/25/2016
- **Minimum Passing:** 80
- **Reported Score*:** 93

REQUIRED AND ELECTIVE MODULES ONLY DATE COMPLETED

CITI Conflict of Interest Course - Introduction (ID:15177) 09/26/12

Financial Conflicts of Interest: Overview, Investigator Responsibilities, and COI Rules (ID:15070) 09/26/12

Institutional Responsibilities as They Affect Investigators (ID:15072) 09/26/12

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution

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COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COURSEWORK TRANSCRIPT REPORT**

** NOTE: Scores on this Transcript Report reflect the most current quiz completions, including quizzes on optional (supplemental) elements of the course. See list below for details. See separate Requirements Report for the reported scores at the time all requirements for the course were met.

- **Name:** Lisa Shelton (ID: 2872711)
- **Email:** lshelton@craighospital.org
- **Institution Affiliation:** Regis University (ID: 745)
- **Institution Unit:** Nursing
- **Phone:** 303-789-8572
- **Curriculum Group:** CITI Conflicts of Interest
- **Course Learner Group:** Conflicts of Interest
- **Stage:** Stage 1 - Stage 1
- **Report ID:** 8854996
- **Report Date:** 08/10/2015
- **Current Score**:** 93

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES MOST RECENT

CITI Conflict of Interest Course - Introduction (ID:15177) 09/26/12

Financial Conflicts of Interest: Overview, Investigator Responsibilities, and COI Rules (ID:15070) 09/26/12

Institutional Responsibilities as They Affect Investigators (ID:15072) 09/26/12

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COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM) COURSEWORK REQUIREMENTS REPORT*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details.

See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Lisa Shelton (ID: 2872711)
- **Email:** lshelton@craighospital.org
- **Institution Affiliation:** Regis University (ID: 745)
- **Institution Unit:** Nursing
- **Phone:** 303-789-8572
- **Curriculum Group:** Human Research
- **Course Learner Group:** Social Behavioral Research Investigators and Key Personnel
- **Stage:** Stage 2 - Refresher Course
- **Report ID:** 16495626
- **Completion Date:** 07/08/2015
- **Expiration Date:** 07/07/2018
- **Minimum Passing:** 80
- **Reported Score*:** 100

REQUIRED AND ELECTIVE MODULES ONLY DATE COMPLETED

SBE Refresher 1 – Instructions (ID:943) 07/08/15
 SBE Refresher 1 – History and Ethical Principles (ID:936) 07/08/15
 SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID:937) 07/08/15
 SBE Refresher 1 – Informed Consent (ID:938) 07/08/15
 SBE Refresher 1 – Defining Research with Human Subjects (ID:15029) 07/08/15
 SBE Refresher 1 – Privacy and Confidentiality (ID:15035) 07/08/15
 SBE Refresher 1 – Assessing Risk (ID:15034) 07/08/15
 SBE Refresher 1 – Research with Prisoners (ID:939) 07/08/15
 SBE Refresher 1 – Research with Children (ID:15036) 07/08/15
 SBE Refresher 1 – Research in Educational Settings (ID:940) 07/08/15
 SBE Refresher 1 – International Research (ID:15028) 07/08/15
 Biomed Refresher 1 - Instructions (ID:960) 07/08/15

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

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- **Email:** lshelton@craighospital.org
- **Institution Affiliation:** Regis University (ID: 745)
- **Institution Unit:** Nursing
- **Phone:** 303-789-8572
- **Curriculum Group:** Human Research
- **Course Learner Group:** Social Behavioral Research Investigators and Key Personnel
- **Stage:** Stage 2 - Refresher Course
- **Report ID:** 16495626
- **Report Date:** 08/10/2015
- **Current Score**:** 100

REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES MOST RECENT

SBE Refresher 1 – History and Ethical Principles (ID:936) 07/08/15
 Biomed Refresher 1 - Instructions (ID:960) 07/08/15
 SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID:937) 07/08/15
 SBE Refresher 1 – Informed Consent (ID:938) 07/08/15
 SBE Refresher 1 – Research with Prisoners (ID:939) 07/08/15
 SBE Refresher 1 – Research in Educational Settings (ID:940) 07/08/15
 SBE Refresher 1 – Instructions (ID:943) 07/08/15
 SBE Refresher 1 – International Research (ID:15028) 07/08/15
 SBE Refresher 1 – Defining Research with Human Subjects (ID:15029) 07/08/15
 SBE Refresher 1 – Assessing Risk (ID:15034) 07/08/15
 SBE Refresher 1 – Privacy and Confidentiality (ID:15035) 07/08/15
 SBE Refresher 1 – Research with Children (ID:15036) 07/08/15

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

CITI Program


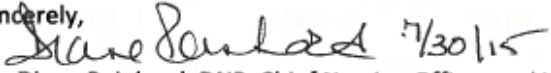
Email: citisupport@miami.edu

Phone: 305-243-7970

Web: <https://www.citiprogram.org>

Appendix G

Facility Letter of Agreement

 <h1 style="margin: 0;">Craig Hospital</h1> <p style="margin: 0;">Redefining Possible for People with Spinal Cord and Brain Injuries</p> <p style="margin: 0;">Letter of Agreement</p>
<p>July 15th, 2015</p> <p>To Regis University Institutional Review Board (IRB):</p> <p>I am familiar with Lisa Shelton's research project entitled "An Exploration of Nurses' Perceptions of Resuscitation of Traumatic Brain and Spinal Cord Injured Patients". I understand Craig Hospital's involvement to be allowing employees to be interviewed and allowing access to interdisciplinary case review records.</p> <p>The study protocol involves an interpretive phenomenological methodology. A purposive sample of 8-10 registered nurses will be identified. Following informed consent, participants will participate in one-to-one face-to-face 45-60 minute interviews with the nurse researcher in a private location. Interviews are audio-recorded, transcribed and coded for themes. Questions asked are:</p> <p>What was your perception of participating in resuscitation for a TBI or SCI patient? Describe the experience? Who was present? What happened? What was your role?</p> <p>What effect did the patient's spinal cord injury or traumatic brain injury have on your participation in the resuscitation? Describe how you were prepared for this experience.</p> <p>What were your feelings and emotions in participating in resuscitation for an SCI or TBI patient?</p> <p>What would you have wanted to know more about in the resuscitation of an SCI or TBI patient?</p> <p>I understand that this research will be carried out following sound ethical principles and that participant involvement in this research project is strictly voluntary and provides confidentiality of research data, as described in the proposal.</p> <p>Therefore, as a representative of Craig Hospital, I agree that Lisa Shelton's research project may be conducted at our agency/institution.</p> <p>Sincerely,  7/30/15 Dr. Diane Reinhard, DNP, Chief Nursing Officer and VP of Patient Care Services</p>

303-789-8260 dreinhard@craighospital.org
Instructions: (Select one)
<ul style="list-style-type: none">• Fax with original signature to (303) 964-5528• Email as pdf file with original signature to irb@regis.edu from an official agency email address.• Adobe electronic signature to irb@regis.edu

For Regis University sponsored research in cooperation with other organizations or agencies:

- A **Letter of agreement** from *each* organization or agency cooperating in Regis University sponsored research is necessary to ensure that relevant information regarding the proposed research has been shared with and agreed to by the appropriate agency or institutional authority. The institutional authority is an individual who has signatory authority for the organization (e.g. school principal, chief executive officer, etc.).
- Letter(s) of Agreement **must be provided to the Regis University IRB**. This is one of the prerequisites for protocol approval.
- Letter(s) of Agreement must be on the **official organization or agency letterhead** using the template shown above.

Appendix H

Facility Research Taskforce Approval Letter



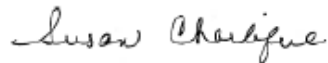
6 January 2016

To Whom It May Concern,

The Research Task Force at Craig Hospital has reviewed and approved the proposal from Lisa Shelton regarding her study titled "An Exploration of Nurses' Perceptions of Resuscitation of Traumatic Brain Injured or Spinal Cord Injured Patients". The Research Task Force consists of doctoral members of the Research Department staff, members of the Craig Hospital medical staff and clinical department supervisors or directors as well as the President of the hospital. This body has deemed it sufficient that IRB approval from Regis is in place and there is no need to seek HealthOne IRB approval.

If you have any questions, please do not hesitate to contact me.

Sincerely,



Susan Charlifue, PhD, FISCoS, FACRM
Chair, Research Task Force