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The purpose of this study had two aims. The first was to explore nurses' knowledge of nursing surveillance related to the septic patient and to describe barriers that prevented the implementation of nursing surveillance. This was a qualitative descriptive design study using focus groups to elicit responses to open ended questions. A total of 28 participants were interviewed in 6 focus groups with each group ranging from 4 to 8 participants per group. All members of the focus groups were registered nurses with a minimum of six months experience having cared for a septic patient. Five themes emerged from the study: 1) Mixed emotions 2) Lack of resources 3) In the dark 4) Lack of partnership/respect 5) Knowledge deficit [a] septic bundle [b] nursing surveillance. Sepsis continues to be a life-threatening condition that stems from an aggressive and dysregulated response to an infection. Sepsis is a leading cause of death in the United States.

Despite the vast number of resources to better understand and treat the condition, sepsis continues to be an epidemic. The key to successful treatment of sepsis is the timely and through treatment plan to avoid multiorgan system failure. Nurses must understand and implement nursing surveillance as part of the treatment plan. Unique findings of this study were the notion of fearing the septic patient and knowledge deficits of nursing surveillance and sepsis bundle. The issue of fear of caring for a septic patient and knowledge deficits for nursing surveillance would benefit from further research.

NURSES' KNOWLEDGE REGARDING NURSING SURVEILLANCE OF THE SEPTIC PATIENT

by

Paul H. J. LeBlanc

A Dissertation Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
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Doctor of Philosophy

Greensboro
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Approved by

_____
Committee Chair

DEDICATION

This work is dedicated to my wife, my children, their spouses and our grandchildren.

Without your support this would not have been possible.

Much Love

APPROVAL PAGE

This dissertation written by Paul H.J. LeBlanc has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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CHAPTER I

INTRODUCTION

Over the past 20 years, research has demonstrated that patients suffer at the hands of those charged with caring for them (Baines, Langelaan, Bruijne, SPreeuwenberg & Wagner 2015; James, 2013; Kavanough, Saman, Bartle & Westerman, 2017; Makary & Daniel, 2016). As early as 1999, The National Academy of Medicine (formerly The Institute of Medicine (IOM) identified issues related to the delivery of patient care. Two reports, "*To Err is Human; building a safer health system"* written in 1999 and a follow up "*Keeping patients safe: transforming the work environment of nurses"* completed in 2003 were critical of our national health care system. Both reports noted significant harm and injury were occurring at the hands of nursing care providers (Institute of Medicine [IOM], 2003).

In 2018 the National Academy of Science [NAS] released a follow up report to the 1999 and 2003 reports entitled "*Crossing the Global Quality Chasm: Improving Health Care Worldwide,"* The report focused on the notion that meeting the full potential of improving health will only be accomplished if the goal of improving the quality of healthcare is improved. In the report, the NAS identified the damage to human health on a global scale is the result of poor quality health care (NAS,2018).

Globally, in low and middle income countries the death toll related to poor quality of health care was responsible for the death of 5.7 to 8.4 million people. This translates into 10 to 15 percent of all deaths within these countries. The loss of productivity that results accounts for 1.4 to 1.6 trillion dollars per year. The report also criticizes the level of fragmented care that is a problem shared by all countries regardless of economic status. Fragmented care is described within current systems as patients moving from unit to unit, care setting to another care setting with a range of providers that leads to a silo approach to care. There remains a lack of communication and coordination among providers which leads to episodic care, focused treatments that may not consider the patient as a whole entity which creates duplicate work and waste. Even within high-income countries that may have electronic health records (EHR), information is often difficult for the patient to receive and is often created into many pieces (NAS, 2018).

Hospitals and health care systems continue to develop improvements in quality care initiatives and operational efficiency. Recent studies have estimated that 200,000-400,000 Americans die from preventable medical errors each year (James, 2013; Kavanough et al., 2017). The use of a national healthcare system with well-defined and uniformed implementation of standards may be difficult to compare to the often fragmented and non-centralized delivery of healthcare that occurs in the United States. The evaluation of mortality due to medical error may be underestimated given the rate of adverse events that occur and are often precursor events to mortality (Kavanough et al., 2017).

The topic of medical errors is broad. Of importance, health care associated infections, wrong site surgeries, and patient harm and death due to medical errors have gained national attention for the past two decades (Berglund et al 2012; Makary & Daniel, 2016). A more contemporary issue in the field of medical errors is the concept of failure to rescue. Failure to rescue is defined as the death of any patient that is a direct result of any complication that was not present during a hospital admission and is a failure of a healthcare providers to detect changes in condition early and provide appropriate urgent medical care and treatment (Barco & Putnum, 2011; Buck, 2014; Clarke & Aiken, 2003, Silber, 1999). Sepsis is one medical condition, with a known high rate of mortality that may also have a high rate of failure to rescue (Bergulnd, et al., 2012; Danie, 2016 & Kavanough et al., 2017).

Quality Adjusted Life Year

The Quality-Adjusted Life Year (QALY) is an outcome measure that provides cost effective analysis in healthcare. The QALY evaluates the quantity and quality of life that results from the level of healthcare intervention required by individuals to maintain a state of health. The QALY also reviews life years gained by the quality of health and care provided. In QALY the time and health state of a person is weighed by a utility score related to the state of health. For example, a person who has one year of perfect health, is given a QALY of one, and death a score of zero. Scoring in this manner provides a metric that can be used to measure the value and risks of healthcare interventions (Wichman et al, 2017).

The QALY can be used to calculate the economic impact of deaths due to medical errors as well. To begin the calculation, data from the 1998 report *"To Err is Human",* from the Institute of Medicine (now known as the National Academy of Medicine), estimated that 98,000 deaths occurred annually due to medical errors. The report "To Err is Human" also established that the average loss of 10 years of life resulted from the death from a medical error. That is, had the death not occurred, the individual on average would have had an additional 10 years of life (Andel, et al., 2012)

The annual cost associated with the loss of life ranges between 75,000 to 100,000 dollars per year (IOM, 1999). To calculate the QALY loss, the annual death rate of 98,000 lives, multiplied by the average loss of ten years gives rise to a total loss of 980,000 dollars. Next, multiplying the average costs of lost life at 75,000 to 100,000 dollars bring the total negative economic impact to 73.5 to 100 million dollars. (Andel, 2012; Classen et al., 2011).

A study by Classen et al. in 2011 noted that the current methodology for calculating adverse events up to and including death was not highly sensitive in determining the actual annual death rate as noted in the 1999 publication by the IOM. For greater sensitivity, Classen et al. used the Institute for Healthcare improvement tool known as the Global Trigger Tool. The tool adapted specific methodologies to review medical records. Several variables are reviewed including discharge codes and summaries, medications, lab results, operative notes, progress noted from physicians and nurses. Review of this information may provide triggers that leads to the investigation of an adverse event that may have occurred. The estimates from the work of Classen et al.

were ten times higher than those reported by the IOM report in 1999. If this information is correct, the actual negative impact related to death by medical error would be estimated to be 75.3 billion to 98 billion dollars (Andel et al., 2011).

Sepsis

Sepsis is defined as a life-threatening condition that results from an aggressive and dysregulated response to the source of infection by the host (Bayer et al, 2014; Jones et al, 2015). Sepsis has been categorized in one of two ways. First, sepsis was described as a systemic inflammatory response syndrome (SIRS). The characteristics of SIRS included at least two of the following signs/symptoms; elevated temperature, hypothermia, tachycardia, rapid respiratory rate and/or an abnormal white blood cell count. Clinically the patient may present with nonspecific complaints that may not trigger a differential diagnosis of sepsis (Bayer et al, 2014; Jones, et al., 2015; Singer, Taylor, LeBlanc, Williams & Thode 2014).

Severe Sepsis

Severe sepsis is characterized by similar characteristics as SIRS. In addition to SIRS, severe sepsis includes an acute event impacting single or multiple organ dysfunction. This dysfunction may be noted as changes in baseline mental status, hypotension and hypo-perfusion. The onset of severe sepsis can be sudden with dire consequences if symptoms are not recognized early and treatment begun immediately. The presentation of the severe sepsis may be subtle. The clinician may fail to fully appreciate the pending severity of illness. Delay in the treatment of severe sepsis can lead to poor outcomes including death. Aggressive fluid resuscitation and pharmacological

intervention including vasopressors is required emergently. Severe sepsis is an acute, emergent and life-threatening condition that requires immediate intervention (Bayer et al, 2014; Singer et al 2014).

It is important to note that the use of SIRS criteria as it relates to sepsis and septic shock has come under scrutiny. Over the last fifteen years there have been many advances regarding the pathobiology, management and understanding of sepsis that suggest that the inclusion of SIRS characteristics related to sepsis may require reexamination (Singer, Deutschman, Seymour et al., 2016). The previous use of two or more SIRS criteria to identify sepsis are no longer credible. In of themselves, SIRS criteria do not indicate a dysregulated, life threatening response similar to those definitions of sepsis and severe sepsis (Singer, et al, 2016).

The SIRS response may be one that is a result of conditions outside of infection. These include burns, trauma and pancreatitis (Balk, 2013; Singer et al, 2016). In addition, several problems have been identified with the use SIRS definitions. The criteria set out for SIRS are too sensitive. The current definition does not differentiate between the normal beneficial inflammatory responses of an infectious process to one that begins as a generalized host response that proliferates to organ dysfunction whereby the role of infection is not clearly identified (Singer et al, 2016). There continues to be discussion and controversy about the connection between SIRS and sepsis. The intent is to best identify those with conditions that lead to systemic organ dysfunction and death to implement urgent and appropriate treatments for the best outcomes (Balk, 2014; Singer et al, 2016; Vincent, Opal, Marshall & Tracey, 2013).

Background and Significance

Sepsis

Sepsis is one of the leading causes of death in the United States. The mortality rate is higher for those who are older. For those patients who are 65 years and older, sepsis is the 10th leading cause of death (Jones et al, 2015). Simply put, the older someone is when they are diagnosed with sepsis, the greater their likelihood of dying of the condition. This is of particular concern for an age group that continues to grow and live longer. Rates of mortality related to sepsis range from 32%-50% (Dariaud et al., 2015; Rhee et al., 2017).

Patients who are 65 years and older are categorized into two groups. Those 65 to 79 years of age are considered elderly while those who are 80 years old and older are considered very elderly. Mortality for the elderly was noted at 47.4% compared to the very elderly group with a mortality rate of 54.2%. Age was an independent risk factor only for the very elderly group (Martin-Loeches et al., 2019).

The most recent data from the Agency for Healthcare Research and Quality (AHRQ) identified the aggregate costs for hospital stays in 2011 as $387 billion dollars. The escalating costs of healthcare surpassed the Gross Domestic Product (GDP) reaching nearly 18 Percent (Torio & Andrews, 2013). A breakdown of the top five conditions that were most costly included sepsis, osteoarthritis, complications of implants and grafts, live newborn infants and acute myocardial infarction. The primary payers for these hospital stays included Medicare and Medicaid. Combined Medicare and Medicaid were

responsible for 63% of all aggregated costs for a total of $242.9 billion dollars. In 2011, sepsis was the most expensive condition billed to Medicare (Torio et al., 2013).

The publicly funded national healthcare programs of Medicare and Medicaid continue to provide the bulk of cost for care for all hospital admissions (Torio et al, 2013). Escalating costs of health care and the expenses related to the elderly who are living longer are consuming more healthcare dollars near end of life (Rhodes et al, 2015). Although healthcare costs related to failure to rescue and sepsis are not part of this research, it is important to highlight the growing costs related to sepsis and the need for research to successfully identify and treat sepsis early for successful outcomes.

Surviving Sepsis Campaign

A great deal of literature and research is available regarding the conditions of sepsis and severe sepsis. Despite the vast number of resources to better understand and treat the condition, sepsis continues to be an epidemic. The death rate remains high, and the long term impact of sepsis survivors continues to devastate patients and their families (Rhodes et al, 2015). Initial work began in 1997 with the International Sepsis Forum (ISF), which was an international collaborative of researchers and leaders in the field of the sepsis. The ISF was organized by the Bayer Corporation as part of a clinical trial for a new monoclonal antibody directed against tissue necrosis (Marshall, Dellinger & Levy, 2010). Although the initial trial failed, ISF grants remained intact which permitted academics and pharmaceutical companies to continue with the work (Marshall, et al, 2010).

Continuing the original work of 1997, the surviving sepsis campaign (SSC) was developed in 2002 as a result of a collaboration among the European Society of Intensive Care Medicine, the International Sepsis Forum and the Society of Critical Care Medicine (SCCM). The goal of the SSC was to reduce the mortality from severe sepsis and severe sepsis by standardizing the use of evidenced based care guidelines and educate clinicians and communities to improve awareness surrounding sepsis (Levy et al, 2014; Rhodes et al, 2015). The high death rate and devastation related to sepsis was viewed as a global problem, requiring a global initiate to combat the condition. The overarching goal at that time, was to target a goal of a 25% relative reduction in the risk of death due to sepsis (Marshall, et al, 2010). The SSC hoped to meet this target by 2007.

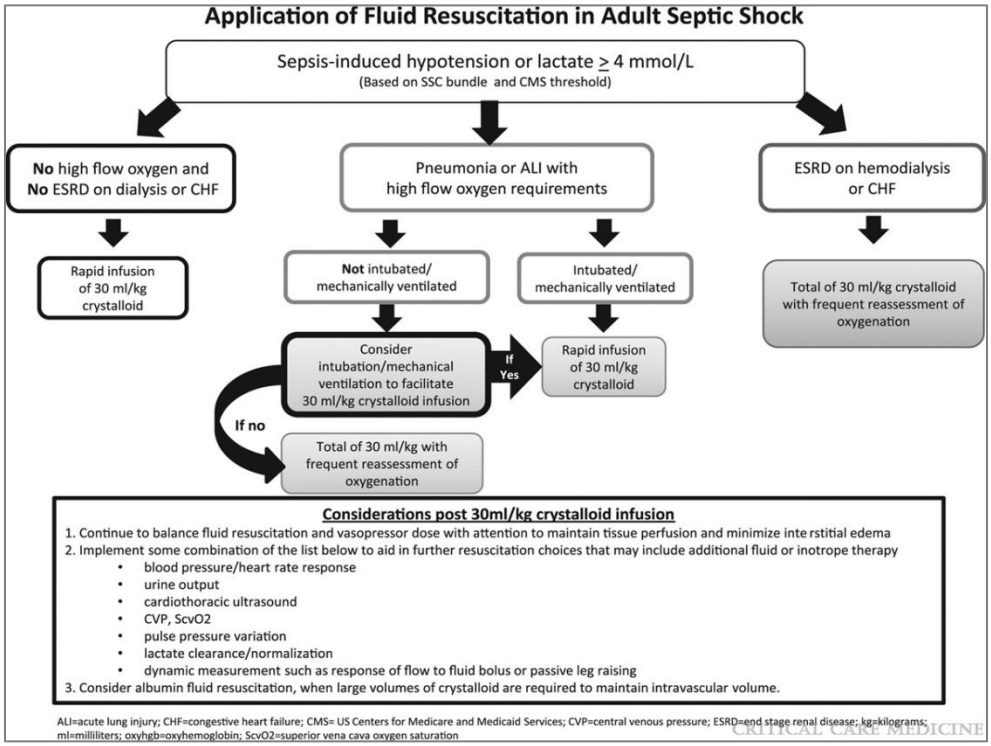
Despite the backing of major industries, academic and an international presence to meet the goals of improving the outcomes related to sepsis, the SSC realized that publishing guidelines would not be enough to be successful in impacting clinical practice. In 2004, the SSC moved towards a collaboration with the Institute of Healthcare Improvement (IHI) to improve the early management of hospitalized septic patients. In 2004 the IHI unveiled the 100,000 lives campaign that was focused on the use of evidence-based care strategies using bundles. These bundles are the standardized and sequential use of evidence-based interventions directed towards specific conditions with appropriate use and documentation to better understand the compliance and impact on these bundles. However, high rate of sepsis, inconsistent use of bundles and high rate of mortality with sepsis necessitates continued research into this condition.

Recommendations for Bundle Care

Initial Resuscitation recommendations related to the treatment of sepsis induced hypoperfusion in 2016 included the administration of crystalloid fluids at a rate of 30 ml/kg. This infusion was recommended within the first three hours of arrival to hospital. Following the initial fluid resuscitation, additional fluids are provided dependent of the evaluation of hemodynamic status. The goal is to maintain a Mean Arterial Pressure (MAP) ≥ 65 mmHg (Dellinger, Schoor & Levy, 2017). On-going clinical evaluation of physiological markers obtained via invasive or non-invasive monitoring is also part of the bundle (see figure one).

Figure 1. Application of Fluid Resuscitation in Adult Septic Shock

From "A user's guide to the 2016 Surviving Sepsis Guidelines. Dellinger, Schorr & Lew (2017). Critical Care Medicine 45 (3) 381-385. Copyright 2017 Wolters Kluwer Health Inc. (used with permission)



The use of anti-microbial therapy is also recommended as soon as possible after the recognition of the sepsis event and within one hour. Rapid intervention is required to have the greatest benefit to positive patient outcomes. In the presence of sepsis or septic shock, each hour delay in administration of appropriate antimicrobials increases mortality, kidney, lung and organ injury (Dellinger et al., 2017). Initial therapy recommendations include empiric broad-spectrum therapy to kill all likely pathogens.

Changes to the antimicrobial therapy can be made once the pathogen is identified and sensitivities are identified (Dellinger et al., 2017).

Redefining Criteria for Septic Shock

In 2016 the Society of Critical Care Medicine (SCCM) and the European Society of Intensive Care Medicine (ESICM) convened a task force to review and revise the definitions for sepsis and septic shock. The SCCM and ESICM challenged previous criteria of septic shock that referred to the condition as acute circulatory failure associated with infections. On-going research demonstrated that developing biological markers and epidemiology of sepsis made the previous definition of septic shock obsolete (Shankar-Hari et al, 2016).

The initial definition of septic shock was established in 1991 and was reviewed again in 2001. With the availability of large data sets and accessibility of information opportunities were provided to better understand the variability in septic shock epidemiology provided by numerous observational studies. The variability, interpretation and application of the differing definitions of septic shock, including incidence and outcomes required explicit standardization of the clinical criteria for sepsis and septic shock. It was interesting to note in the research by Shankar- Hari et al in 2016 that although the systematic review of literature noted differences in the criteria to define septic shock, there was consistency in the rate of mortality.

The SCCM and ESICM developed a task force comprised of one co-chair from each organization and a total of 17 additional members. These 17 members of the task force were selected based on their scientific expertise in epidemiology of sepsis, clinical

trials and research (Shankar-Hari et al., 2016). The task force participated in systematic reviews and meta-analysis reviewing and assessing different criteria in establishing the diagnosis of septic shock, and to determine any variations in patient outcomes.
The task force also participated in a Delphi study. The Delphi method is a method of communication that is a structured technique that is used for gathering data from a group of experts within their area of expertise. The Delphi method is a communication process whereby experts answers questionnaires (Hsu & Sandford, 2007). In the body of work by Shankar-Hari et al. the questionnaires were completed in three rounds (Shankar-Hari et al., 2016).

The SCCM and ESICM redefined the definition of septic shock as a subset of sepsis. Within septic shock, the underlying abnormalities of the circulatory system, cellular and metabolic responses had a greater risk of mortality than sepsis alone. The task force also identified clinical criteria for septic shock which included the presence of hypotension requiring vasopressor support to maintain a mean arterial pressure (MAP) of 65mmHg or higher and a persistent lactic acid level greater than 2 despite adequate fluid resuscitation (Shankar-Hari et al., 2016).

This definition differs from previous definitions in two ways. The new definition of septic shock requires both lactic acid levels and vaso-pressor dependent hypotension. Previous definitions required only one or the other. In addition, the new definition sets a target lactic acid level at 2 rather than the previous level of 4. A rising lactic acid level beyond 2 may be an indicator for impending cellular metabolic abnormality and is a variable independently associated with acute mortality (Shankar-Hari et al., 2016).

Surviving Sepsis Campaign Bundle Update 2018

In 2018, an additional update was provided by the SCCM and ESICM regarding the sepsis bundle. The SCCM and ESCIM continue to identify sepsis as a true medical emergency. To improve patient outcomes, sepsis requires early identification, timely and appropriate management following sepsis bundle guidelines. The updated guidelines stress the importance of initial fluid resuscitation and identifying sources of infection to appropriately treat with antibiotics as well as lab work including white cell count, blood cultures and measurement of lactic acid. Critical to the successful outcomes of a patient who is septic is close monitoring of physiological data, mental status changes and the maintenance of a stable hemodynamic state.

Changes to the bundle include the combination of the three and six hour bundle into a one hour bundle. The intent of the one hour bundle is to begin resuscitation and management of the septic patient immediately. This immediate intervention is especially important for septic patients who are hypotensive. Implementation of the bundle may take more than one hour to be completed, however having all components of the bundle activated and/or administered within the first hour is appropriate (Levy, Evans & Rhodes, 2018).

Failure to Rescue

Patient outcomes, clinical performance measures, and quality initiatives have gained national attention since the IOM's initial report in 1999 ((IOM), 1999). As mentioned above, failure to rescue (FTR) has been described as the death of any patient that is a result of a complication that was not present during the initial admission (Clarke

& Aiken, 2003). In addition, FTR is deemed present when the patient has complications that lead to death as a result of the failure to recognize signs and symptoms of deterioration from treatable conditions resulting in the lack of appropriate actions or activation of resources has not been obtained to save the patient's life (Shever, 2011).

This responsibility includes purposeful surveillance of the patient condition including vital signs, lab values, changes in mentation and overall condition (Brier et al., 2014). The nurse is also responsible for timely reporting of any changes in the patient condition to the appropriate provider. Implementation of the medical plan, evaluation and consistent monitoring is recognized as a major responsibility of the nurse providing care. When the nurse does not recognize early changes in condition from the assessment and evaluation of the patient, including data from the patient and other sources, appropriate treatments may not be implemented within an appropriate timeframe (Henneman, 2012; Voepeo-Lewis et al, 2012). Maintaining a high level of vigilance through nursing surveillance is a key element in keeping the patient safe and possibly decreasing the incidence of failure to rescue of the septic patient (Brier et al., 2014).

The concept of FTR began with initial research by Silber, Williams, Krakauer and Schwartz in 1992. The concepts of FTR were a result of the increasing number of complications noted during a hospital stay (Talsma, Bahl & Campbell, 2008). Most prominent was the work of Dr. Jeffery Silber who was an outcomes researcher at the University of Pennsylvania. Silber's research began to evaluate the quality of healthcare providers as measured by patient outcomes, specifically the unanticipated death of a patient due to post-operative complications (Talsma et al., 2008). Since 1992, there has

been increased scrutiny of performance, in particular FTR. In 2003, the Agency for Healthcare Research and Quality (AHRQ) adopted FTR as a patient safety indicator. The AHRQ adopted broader terms for FTR that include any patient that dies during hospitalization after the development of a complication (Bahl, 2008; Talsma et al., 2008).

Failure to rescue has several components that are associated with each other and occur in sequence. The first event is the failure to recognize the severity of illness of the patient being cared for. This lack of recognition does not establish the level of care as a priority for the patient during a period of impending medical crisis. This concern was raised by the IHI in 2013. Second, there is a failure to appropriately intervene with changes to the severity of illness of the patient. Failure to act includes the lack of or underutilization of resources to identify and implement appropriate treatment regimens to aggressively address the impending medical crisis (Johnston, Arora, King, Stroman & Darzi, 2014).

Failing to recognize the deterioration of a patient's condition and failure to intervene to counteract treatable conditions leading to death is also a component of failure to rescue. The IHI was especially critical of the failure by nurses to recognize subtle changes in the patient's condition and intervene quickly and appropriately to prevent death and improve patient outcomes. Nurses provide the greatest amount of bedside care to patients. The role of the nurse is to identify changes in patient conditions and make appropriate referrals or take action to address these changes. The IHI noted that the impact of the lack of early identification and intervention by the nurse contributed to

an estimated 35-40% of unexpected deaths occurring on the general medical and surgical nursing units (Roney, Maples, Futrell, Stunkard & Long, 2015).

Subtle changes in a patient's condition prior to a significant event are described as antecedents. Clear understanding of these antecedents for the septic patient and appropriate intervention may provide a framework for the type of tools and actions that are required to improve the SSC. The identification of antecedents and immediate intervention may have a positive impact on the issue of FTR for the septic patient (IHI, 2013; Johnston et al, 2014; Roney et al, 2015;). There continues to be a paucity of literature that addresses data dealing with the antecedent evaluation of the septic patient. This is an excellent opportunity to add to the current body of research.

Failure to Rescue as a Nurse Sensitive Indicator

Research by Needleman, Buerhaus, Matike, Stewart and Zelevinsky in 2002 reviewed the impact of nurse staffing levels in hospitals and the potential associated risks with complication and/or death. Data for this study were obtained by looking at a large administrative database of medical and surgical patients in 1997. These data were collected from 11 states and nearly 800 hospitals. The intent of the study was to examine the relationship of the amount of care that was delivered by nurses in the hospital to patient outcomes. In the study, Needleman et al. found that a higher level of nursing care hours provided to hospitalized patients were associated with shorter length of stay, deceased urinary tract infections, decreased lower GI bleeding, decreased pneumonia, decreased rates of shock and fewer deaths (Needleman et al., 2002).

Most notably was the finding that higher hours of care delivered to medical patients by registered nurses were associated with lower rates of pneumonia, shock and cardiac arrest. The researchers also noted a decrease in failure to rescue. The findings were similar for surgical patients. A higher level of hours of care by the professional nurse to the surgical patient demonstrated lower rates of urinary tract infections and lower rates of failure to rescue (Needleman et al., 2002).

This research was able to determine that patient outcomes were in part impacted by the delivery of nursing care. The association of patient outcomes that were sensitive to nursing care and nurse staffing resulted in the National Quality Forum (NQF) adapting the work with some modifications to note failure to rescue as a nurse sensitive quality measure (NQF, 2004). In 2007, the AHRQ established failure to rescue as a nurse sensitive quality measure (AHRQ, 2007). Failure to rescue has been categorized as a nurse sensitive indicator (Ferrias, Bolanos, Martin, Mahan & Saha, 2014; Talsma et al., 2008).

More recent research by Mustha, Rush and Andersen (2018) validated the earlier findings related to FTR. In their research FTR was described as a nurse sensitive indicator. The researchers also described FTR as having additiona components. Errors of omission occur when nursing care is omitted or forgotten that contributes to patient harm. In addition, failure to recognize subtle signs of deterioration, failure to escalate information to providers in a timely manner and ineffective decision making may all contribute to failure to rescue (Mushta et al., 2018).

The responsibility and accountability for patient care around the clock is held by both nurses and physicians. However, the role of the nurse provides the delivery of hands on care and surveillance of the patient's condition 24 hours per day. Nurses play an integral role in minimizing the impact of failure to rescue by remaining vigilant in care and monitoring of the patient.

Nurse Surveillance

Nurse surveillance has been described as "the purposeful and ongoing acquisition, interpretation and synthesis of patient data for clinical decision making" (Brier et al, 2014, p. 883). It is important to note that nursing surveillance is not the same as nurse monitoring. Nurse monitoring is the use of data collection tools and is a function of the assessment process of nursing (Henneman, Gawlinski & Giuliano, 2012). Monitoring includes the process of observation, reviewing and interpreting physiological data that is obtained by vital signs, lab values and other parameters reported through the use of hardware and software.

Nurse surveillance is much more detailed and complex than nurse monitoring. The goal of nursing surveillance is to detect subtle changes in the patient condition and to intervene using appropriate resources and tools to avoid a poor outcome. In 2011, Kelly and Vincent identified nursing surveillance that focuses on the individual with a separate framework for care that is specific to meet the individual's needs with specific interventions. The framework for care and interventions results from the cognitive and interpretive actions of the nurse. Nursing surveillance is intended to identify at risk

patients, implement appropriate treatments and mitigate the risk of death to these patients (Henneman et al., 2012).

In large part, the nurse's role is to keep the patient safe. This is done through the mechanisms that are considered nurse surveillance. These include but are not limited to the collection, interpretation of presented information and analyzing the patient condition as a whole. This also includes data received through monitoring, receiving information from the patient and his/her family, the environment and a keen focus on subtle changes that may be antecedents to significant health deterioration. The goal is to positively influence patient outcomes in a positive manner. Nurses have the capacity to prevent deterioration of a patient's condition (Kelly & Vincent, 2010). This is accomplished through identification of changes in the patient condition early with swift and appropriate interventions (Brier et al., 2014; Henneman et al, 2012; Voepel-Lewis, 2012).

Benner's Novice to Expert Model

Benner's model provides insight into the development of a nurse's capacity over time as the nurse develops and accumulates skills. The model has five stages :1) novice 2) advanced beginner 3) competent 4) proficient and 5) expert. In the first stage (novice) the nurse does not yet have the capacity to make decisions or take actions based on differing variables that are presented within a situation.

The second stage (advanced beginner), begins with the initial recognition of all of the complexities and elements of care that are required, however initially unrecognized by the novice. In the competent phase demonstrates changes as the nurse uses past

experiences with new rules and reasoning to begin to see the big picture of patient care. In this stage increased understanding of nursing responsibilities also occurs.

In the third stage (proficient), the nurse has mastered many of the tasks and skills necessary for the nurse to promote care and to establish best practices for the patient to enhance outcomes. In the last stage (expert) stage there are subtle changes and differences noted. The nurse in this stage is able to look at responses provided by the patient or environment as a naturally flowing event without the need to think about the situation (Thomas & Kellgren, 2017).

The development of skills and proficiency with time and experience is evident in Benner's model. This evidence may explain the variance in knowledge between nurses as they begin to understand the concept of nursing surveillance. As the nurse gains experience, exposure to situational events and successfully uses the ability to critically think, may allow the nurse to better understand complex concepts as nursing surveillance.

Simply put, the more experienced a nurse is, having successfully moved through the continuum of novice to expert, the easier it is to better under concepts like nursing surveillance.

Conceptual Model

The conceptual model that informs this study is the Quality Health Outcomes Model (QHOM) that was developed by Mitchell, Ferketich and Jennings in 1998. The work of Mitchell et al., is founded on the linear model of Avedis Donabedian. The work of Donabedian focused on the evaluation of the medical care process that was specific to the interaction(s) between the physician and patient (Donabedian,1966). The model

developed by Donabedian suggests a linear relationship of structure, process and outcomes related to the quality of medical care. The structure includes the physical aspects to include but not limited to the building or location where care is provided, the human resources (staff, training, payment and reimbursement) and systems used to measure the level of quality care delivered. From a nursing perspective, systems also include nursing hours per patient day (NHPPD), the skill mix of the nursing staff, level of education of the nurses providing care, relative experience of the nurse and the use of agency staff (Sim et al., 2017).

The process of care in the Donabedian model include the work of patient assessments, diagnosis, treatments and other aspects of care within the realm of the physician's practice. The process also includes the need for prevention, education and the roles and responsibilities of the patients and their families as partners in care. Donabedian described all aspects of the dimensions of care that provided for quality was enveloped within the process of the model.

The last component of the Donabedian model is outcomes. This is the overall impact of healthcare to the patient(s). Outcomes include the level of wellness, improvements to the health behaviors or knowledge of the patient that may impact his or her well-being and the overall quality of life as interpreted by the patients themselves (Donabedian,1966). The QHOM contains feedback loops and outcomes that are more likely to be sensitive to nursing inputs. The delineation of the relationships between nursing structure and process compared to Donabedian's model, allows for the recognition and impact of nursing on patient outcomes (Mitchell et al, 1998). The QHOM

recognizes the value of the traditional structure and process of the Donabedian model. The QHOM expands the Donabedian model to include a review of clinical processes of nurses which include direct and indirect interventions as well as patient characteristics as a consideration prior to the implementation of treatment or interventions (Mitchell et al,1998).

Figure 2. Representation of Qhom

Mitchell, P., Ferketich, K., & Jennings, B. (1998). Quality health outcomes model. *Journal of Nursing Scholarship* Journal *of Nursing Scholarship, 30* (1). 43-46

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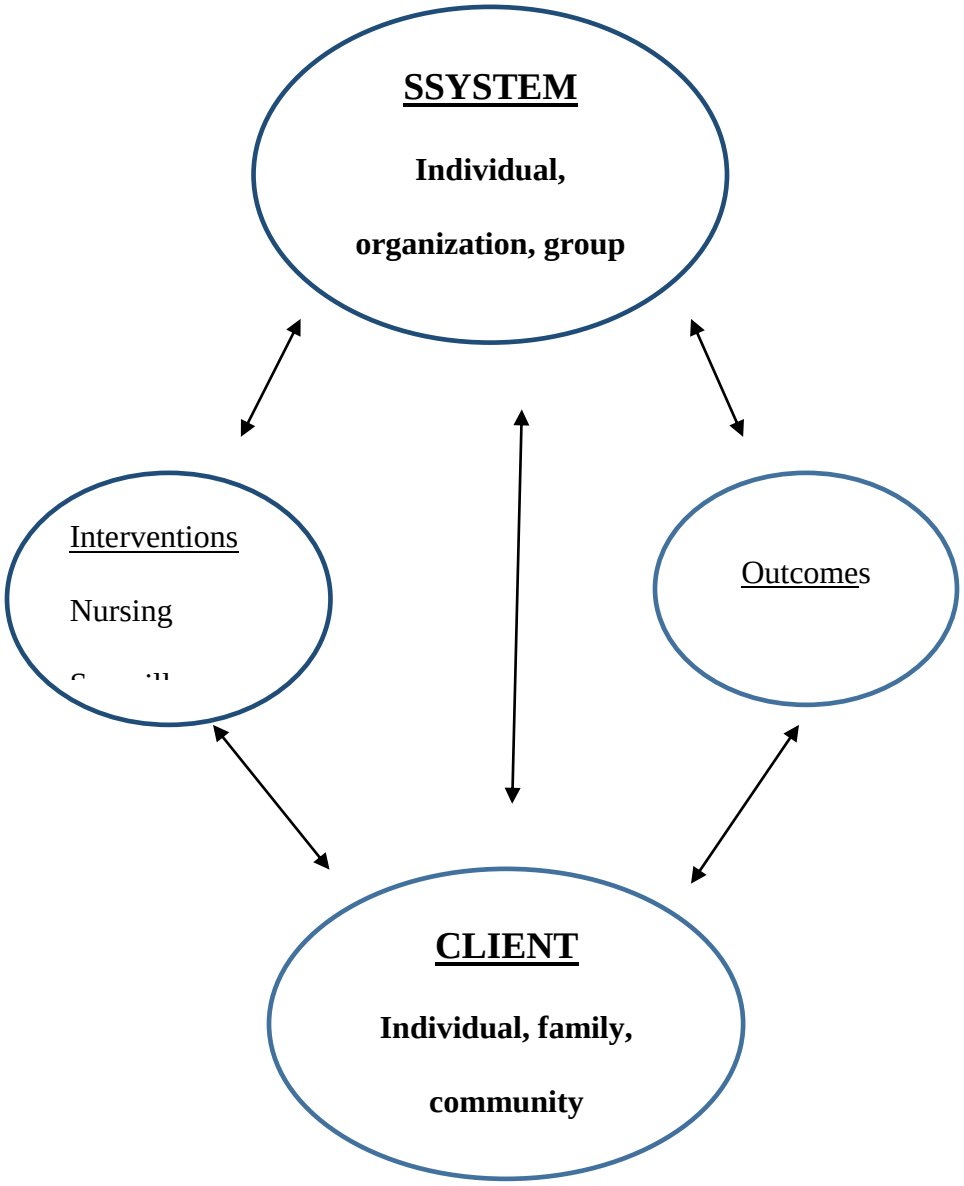

The QHOM recognizes the importance of nursing and nursing interventions to meet the goals of improved patient outcomes. The adaptation of this model focuses on outcome measures that integrate the entire spectrum of possibilities that may impact the patient outcome. This includes social, psychological, physical and physiological aspects of the individual's experience in both health and illness. The figure above demonstrates the bi-directional nature and the relationships among the components. The interventions always act through characteristics of the system and the client (Mitchell et al, 1998). System characteristics are defined along the lines of traditional structure and process elements. The system is characterized as the organized agency, that is, the hospital and/or provider network. Within the agencies, consideration must be given to the size of the agency, ownership, skill mix of those providing care and client demographics. In addition, the level of technology available would also be considered part of the system characteristics. A high degree of technology and appropriate skill mix to meet the patient needs are associated with lower mortality (Mitchell et al., 1998)

In this model, interventions are those clinical processes that are direct and indirect interventions and any related activities that are used to deliver the interventions. The authors provide the example of the nursing intervention of self-care in a long-term care facility. To be effective, the nursing intervention depends on the self-care technique and the interactions among the work group and any unit level processes used by the work group to deliver the intervention.

Research by Pfrimmer, Guthmiller, Lehnam and Rhudy in 2017 demonstrates how the QHOM may be utilized in qualitative studies. These researchers conducted a

descriptive qualitative study of 21 critical care nurses to develop an understanding of how surveillance is expressed. Data were collected utilizing "think aloud" at three time points: shift hand off at the beginning of the shift, during initial assessment of the patient, and at the end of four hours of care. Findings supported the major constructs of the QHOM which outlines the dynamic processes and synergy of the system (including the provision of nursing care) and the patient and interventions put in place to improve care.

The QHOM is a bi-directional model that is dependent on a flow of information in a type of loop system. The QHOM reaches out to the system and client gathering information using interventions such as nursing surveillance. When information is not available or incomplete, the process of the loop is interrupted, and the collection of data is less robust with an impact on the findings and decisions made. This is similar to nursing surveillance. There is a dependence in nursing surveillance on information provided, including subtle changes in condition or trending of physiological monitoring either in an upward or downward motion. Within nursing surveillance, if the information is not complete, or if the loop is broken, decisions that are made for treatment based on incomplete information may be ineffective.

For the purpose of this study the QHOM was used to help structure interview questions as well as to guide data analysis.

Specific Aims

The aim of this research was to explore nurses' knowledge of nursing surveillance as it pertains to the septic patient. A secondary aim was to describe any barriers to successfully implementing a comprehensive nursing surveillance plan.

Definitions

1) **Failure to rescue**: the death of any patient that is a result of a complication that was not present during the initial admission (Clarke & Aiken, 2003).
2) **Failure to rescue due to severe sepsis**: failure of nursing surveillance to assess patients frequently, attending to cues, recognizing complications and acting on complications act on signs of a complication early enough that delays the rescue effort (Clarke & Aiken, 2003)
3) **Nurse surveillance**: "purposeful and ongoing acquisition, interpretation and synthesis of patient data for clinical decision making" (Brier et al, 2014, p. 883).
4) **Sepsis**: is defined as a life-threatening condition that results from an aggressive and dysregulated response to the source of infection by the host (Bayer et al,2014; Jones et al, 2015; Singer et al 2014).

Research Design

Sandelowski (2000) states that a qualitative descriptive study is the method of choice when straight descriptions of a phenomenon are needed (p. 339). Additionally, the method is especially appropriate for finding answers to questions of special relevance to clinicians and policy makers. Qualitative descriptive research can be used with a variety of theoretical approaches, sampling techniques and data collection strategies. Importantly, qualitative descriptive research is particularly useful for junior researchers (Colarfe & Browynne, 2016).

A qualitative descriptive design embraces the general characteristics of qualitative studies without the constraints of more traditional qualitative studies. For example,

ethnographic studies focus on the culture of what is being studied. The lived experience is the phenomenological approach to qualitative design and grounded theory is focused on building a theory from a qualitative perspective. The qualitative descriptive design takes a naturalistic approach to guide the research to create an understanding that is derived from the perspectives and views of those who are participants in the study (Bradshaw, Atkinson & Doody, 2017; O'Brien et al., 2019). Because this study seeks to describe nurses' knowledge of sepsis, as well as barriers to implementing a successful nurse surveillance plan, a descriptive qualitative approach is best suited for this junior researcher.

Summary Chapter I

In the US and internationally, sepsis continues to draw the attention of researchers and the medical community. There continues to be an urgent need for a solution to adapt to and diminish the continued negative impact sepsis has on patients, families and communities. The interest of this researcher regarding sepsis has been heightened, given the increasing rates of septic patients seen in our community hospital with varying results, despite the understanding of standardize care related to the treatment of the septic patient. The need and desire to better understand improved treatments for the septic patient working with community physicians and medical experts continues to be one of the driving forces behind this research.

Much is already understood about the condition and the cascading effects of multi-system organ failure. The need for early recognition of signs and symptoms of sepsis, urgency surrounding appropriated evidence-based treatments and monitoring is

compelling given the research of the past 20 years. The ability of the nurse to recognize and report conditions of sepsis is paramount to the success of sepsis treatment. The term nursing surveillance is noted as a primary tool to improve the outcomes of patients with sepsis. Nursing continues to play a significant role in the early detection, reporting and implementation of treatment for successful outcomes related to septic events. Utilizing the QHOM as a theoretical framework, this descriptive qualitative study will provide additional knowledge on nurses' knowledge of surveillance pertaining to the sepsis patient, as well as barriers to implementing successful surveillance plans of care.

It is important to note that the care of the sepsis patient and recommended guidelines/bundles continually change. With expert analysis and advice, the SSC and the groups evaluating care strive to perfect the care in the hope of moving to improved outcomes for the sepsis patient.

CHAPTER II

REVIEW OF LITERATURE

Failure to Rescue

Failure to rescue has been described as a clinician's inability to save a hospitalized patient's life when complications not present on admission develop (Clarke & Aiken, 2003). To minimize the risk of FTR, the actions of the clinician must be timely and purposeful. Nursing plays a role in mitigating the risk to patients who may have a FTR event. The nurse provides the majority of care to patients admitted to hospital. The role of vigilant nursing surveillance and timeliness of nursing interventions can be successful in interrupting a FTR event (Thielen, 2014).

Work completed by Clarke and Aiken in 2003 and Thielen in 2014 suggested that FTR events and related patient outcomes are nurse-sensitive indicators of the quality of patient care. Nursing surveillance is related to three areas; patient surveillance, analysis of clinical data and implementation of corrective interventions (Clarke & Aiken, 2003; Thielen, 2014). The lack of recognition of changes in patient conditions and/or complications or the lack of activating appropriate interventions is also described as a FTR (Shever, 2011).

Failure to rescue (FTR) has been given increased scrutiny as an outcome measure specific to hospital performance (Johnston et al., 2015). Failure to rescue is a patient safety indicator that many hospitals are tracking and addressing. The Department of

Nursing Care Quality at the National Quality Forum (NQF) has deemed failure to rescue to be an appropriate quality care indicator influenced by nursing care. Clinical performance measures, patient safety and quality issues in healthcare have gained national attention, particularly in the inpatient setting (Johnston, et al., 2015). In 2003, FTR became a patient safety indicator for the Agency for Healthcare Research and Quality (AHRQ) (Johnston et al., 2015; Shever, 2011).

Nurse Staffing Levels

As early as 2002, researchers recognized the impact of hospital nurse staffing on patient outcomes and staff satisfaction. Nurse to patient ratio and the association of patient mortality and FTR was studied by Aiken et al. The risk of death and failure to rescue of the surgical patient was found to be significantly and positively impacted by increased ratios. Aiken and her team noted that for each additional surgical patient assigned to the nurse above a 1:4 nurse to patient ratio increased the risk of death within 30 days of admission by 7%. Also impacted was the level of satisfaction by the nurse and job-related burnout (Aiken et al., 2002).

Staffing levels measured by hours of care was also found to impact inpatient hospital mortality. Research completed in 2011by Needleman, Buerhause, Pandratz, Leibson, Stevens and Harris noted that the number of registered nurses who worked on a nursing unit that was below targeted staffing levels had an increase in patient mortality. Increasing nursing workloads and the overall level of nursing surveillance performed by the registered nurse contributed to patient mortality. This inability to consistently provide

a high degree of nursing surveillance increased the risk of adverse events to the patient (Needleman et al., 2011).

For more than twenty years, researchers and organizations have attempted to better understand and develop treatment modalities to combat the potentially perilous impact of septic events. Sepsis continues to be ranked very high as a cause of death in post-surgical and medical patients both in the ICU and non-ICU settings (Buck, 2014). Despite many years of research and standardization of planning, treatment and early recognition and aggressive treatment, sepsis mortality and morbidity continue to be of concern (Buck, 2014; Jones et al., 2015; Leibovici. 2013; Wawrose, Baraniuk, Standiford, Wade, Halcomb & Moore, 2015). The research focused on nursing surveillance and FTR. The population of interest are those patients with a diagnosis of sepsis and FTR.

The literature review included the landmark study by Silber et al. in 1992. Silber et al. defined the concept of failure to rescue in the clinical setting. The concept was based on patient outcomes including unexpected death. In addition, the skill sets of the medical providers, the structures and processes in place to support patient care were also considered to have impacted patient outcomes. In addition to the landmark study, a review of research related to surgical interventions and comparisons of providers delivering medical care were reviewed. The review of literature also included the impact of nursing resources and the delivery of nursing services and the impact this may have had on failure to rescue. The mode of arrival to the Emergency Department for septic patients, delays in treatment and the epidemiology of sepsis was also reviewed. This

information is important to understand the role research has play in understanding the impact of timely and appropriate interventions for successful outcomes of the septic patient.

The review of the literature also included the role of nursing surveillance in successfully caring for the septic patient. Both nursing and medicine have 24-hour responsibility for patient care, however nursing has an around the clock physical presence on the nursing unit where care is being delivered. The role of nursing surveillance and the successful monitoring, notification of medical providers and acting upon data and physical symptoms is paramount to the successful outcome of the patient with sepsis.

Failure to Rescue the Surgical Patient

The concept of failure to rescue (FTR) was first described within a body of research completed in 1992 by Dr. Jeffery Silber and his colleagues at the University of Pennsylvania (Silber, Williams, Krakauer & Schwartz, 1992). At the time of the study, the measure of hospital quality care most frequently used was the death rate. The level of quality within hospitals presumed that those with a lower adjusted mortality rate were better at preventing complications and preventing death after a complication (denoted as rescue by the researchers). Since the prevention of complications and rescue were not generally reported separately, the researchers hypothesized that prevention and rescue were separate. Variations in complications may be due to patient characteristics and not necessarily hospital practice or physician behavior (Silber et al., 1992). The researchers studied the influence of hospital and patient characteristics on the death rate, adverse occurrence and failure rate.

The study by Silber et al. (1992) is considered a landmark sepsis study. The study involved research on sepsis and failure to rescue the post-operative surgical patient during a hospital stay. The focus of the study viewed the impact of failure to rescue on post-operative patients. The study was a retrospective study involving 531 hospitals from seven states. Data from patient records included 2831 patients admitted for cholecystectomy and 3141 patients admitted for transurethral prostatectomy. These procedures were chosen since both operative procedures were common at the time of the study and both had well known adverse occurrences (Silber et al, 1992). All patients in the retrospective study were Medicare patients.

Three outcome measures were used in the study. The first measure was death rate, calculated as the number of deaths divided by the number of patients. The second measure used was the adverse occurrence rate. This rate is measured as the number of patients who developed an adverse event divided by the total number of patients. A third measure used was the rate of failure. This rate was identified as the number of deaths in patients who developed an adverse occurrence divided by the number of patients who had an adverse occurrence and survived. The intent of the research was to develop a list of possible adverse occurrences for the two surgeries identified above.

The researchers concluded that an adverse occurrence could be distinguished from FTR by the pattern of hospital and patient characteristics. Hospital was defined in this study as the physical structure, physicians and staff working in the hospital (Silber et al., 1992). The researchers concluded that failure to rescue was associated more with hospital characteristics. These hospital characteristics included size of the hospital, advanced use

of technology ($p < 0.05$), board certification of surgical staff ($p < 0.001$) and the presence of experienced nursing staff.

Two follow up studies by Silber et al. were completed in 1995 and again in 2002 studying the impact of failure to rescue. In 1995 Silber, Rosenbaum, Schwartz, Ross and Williams evaluated complication rates as a measure of quality care for those patients who had undergone coronary artery bypass graft surgery (CABG). The researchers attempted to determine if hospital rankings based on complications were the same as hospital rankings based on mortality rates.

The 1995 study was a retrospective study related to in-hospital deaths, complications and death following these complications (failure to rescue). Data were collected for those patients undergoing CABG between 1991 and 1992 from the MedisGroups National Comparative Data Bases. The large database captured 16, 673 patients from 57 hospitals (Silber et al.,1995). The researchers set out to establish any relationship between hospital ranking that were based on rates of complications compared to hospital rankings based on mortality rates. The researchers conducted logistic regression models to predict death, complication and failure to rescue.
For all patients within this study, 43.02% had complications with a death rate 4.3%. The failure to rescue rate was higher at 10%. After adjusting for severity of illness, the researchers found low correlations between hospital rankings of complications (death versus complication, $r=0.07$, $P=.58$) and mortality and failure to rescue (failure to rescue versus complication ($r=0.22$, $P=.11$). The researchers noted that those hospital characteristics that are associated with higher levels of quality of care did have higher

complication rates and also had expected or lower than expected mortality rates. The researchers concluded that hospital rankings based on complication rates provide different information than those based on mortality rates. Therefore, the researchers concluded that complication rates should not be a measure to determine hospital quality of care related to CABG surgery (Silber, et al., 1995).

Further research in 2002 by Silber, Kennedy, Even-Shosha and colleagues sought to determine any differences in patient outcomes when patients were under the care of a board certified compared to those patients who were under the care of non-board-certified anesthesiologist during a surgical procedure. The study was a retrospective study of 217,440 cases of patients 65 years and older from 245 hospitals. The study used a logistic regression model to adjust for patient severity and case mix. Hospital characteristics were adjusted using a compiled list of 10 specific hospital characteristics and adjusted for individual hospitals using the logistic regression modelling (Silber et al., 2002).

The researchers defined FTR as the 30-day death rate in those who developed a complication or died without a recorded complication. The researchers outline FTR as the number of patients who died divided by the number of patients with complications plus the number of patients who died without complications (Silber et al., 2002). Identification of complications were concluded using 41 events defined by ICD-9-CM and CPT codes that were established from the Health Care Financing Administration (now known as the Centers for Medicare and Medicaid). These complications were not exclusive to anesthesia related complication, but also included any adverse occurrence

noted during the hospitalization and was not used as an outcome quality measure (Silber et al., 2002).

In their study, Silber et al. studied characteristics of anesthesiologists and group these providers by cohorts. Those anesthesiologists who were 10 years or less from graduation were noted to be early-career. In this cohort 47% of the anesthesiologists were not board certified. The second cohort identified as those anesthesiologists who were 11-25 years past graduation (referred to as the midcareer group) had a rate of non-board-certified anesthesiologists at only 14%. The last cohort, those graduated 25 years or more had a 25% rate of non-board-certified anesthesiologists. The importance of ranking the cohorts by the researchers allowed for a comparison of outcomes within the cohorts of higher and lower rates of board certification. Finally, the researchers adjusted the study for International Medical Graduates (IMG) to better understand if this group would influence the results of the study.

The researchers found that anesthesiologists who personally performed the case and those who medically directed the case had no impact on patient outcomes. The researchers also found mortality and FTR rates were higher with mid-career anesthesiologists who did not have board certification ($OR_{death} = 1.14$, $P < 0.02$; $OR_{FTR} = 1.13$, $P<0.04$). IMG anesthesiologists did not perform differently than US medical school graduates ($OR_{death} = 0.95$, $P< 0.09$; $OR_{FTR} = 0.95$, $P<0.10$), however the IMG board certified midcareer anesthesiologists had significantly lower death and FTR rates than their US counterparts ($OR_{death} =0.88$, $P<0.03$; $OR_{FTR} = 1.38$, $P<0.01$). For those midcareer IMG non-board certified anesthesiologists, a higher risk of mortality and FTR

was evident compared to their US counterparts (OR_{death} =1.37, P<0.007; OR_{FTR} =0.87, P<0.01). Overall the study suggests that board certification leads to improved outcomes and decreased rates of FTR, however the researchers conclude that other factors apart from certification may also impact outcomes and FTR (Silber et al., 2002).

Impact of Nursing Resources

A study by Needleman et al. in 2002 used an administrative data set from 1997 that reviewed data from more than five million medical patient discharges and 1.1 million surgical discharges from 799 hospitals covering 11 states. The focus of this study was to examine the relationship between the amount of nursing care provided and its impact on patient outcomes. A regression analysis was completed controlling for the patient's risk of adverse outcomes, differences in nursing care and other variables. The study included the following exclusion criteria. Hospitals with average daily census less than 20 patients or occupancy rates below 20% were excluded. Also, those hospitals that had staffing levels below the 7.5 percentile and those with staffing levels above the 92.5 percentile were also excluded. Patient level logistic regression was used to control for differences among hospitals to predict the patient's probability of having an adverse outcome.

The study evaluated the level of staff by registered nurses, licensed practical nurses and nurses' aides. The level of care provided was measured in hours of care provided (Needleman et al., 2002). The study found that complications common in the hospitalized patients included urinary tract infection, pneumonia, and metabolic derangement. The highest rates were noted for FTR, defined in this study as death of a patient with one of five life threatening complications including pneumonia, shock (or

cardiac arrest), upper gastrointestinal bleeding, sepsis and deep vein thrombosis. The researchers determined that early identification by nurses and medical and nursing interventions could influence the risk of death.

Needleman et al. found within the surgical group of patients, a higher level of registered nursing care and greater nursing hours per day were associated with shorter lengths of stay ($P<0.001$), lower rates of urinary tract infections ($P<0.003$) and upper gastrointestinal bleeding ($P< 0.007$). The study also found that a higher proportion of registered nurse hours per day was associated with lower rates of pneumonia (P 0.08), shock or cardiac arrest (P 0.22) and FTR (P 0.96). Among surgical patients higher registered nurse hours were associated with lower urinary tract infections (P1.00), and higher nursing hours per day had lower rates of failure to rescue (P 0.008). In this study, the researchers concluded that a higher proportion of hours of nursing care provided by registered nurses, including a higher level of hours of care per day by the registered nurse were associated with better care for hospitalized patients (Needleman et al., 2002).

In 2002 research regarding the association between nurse to patio ratios and patient mortality, FTR and nurse retention was completed by Aiken, Clarke, Sloane, Sochalski and Silber. In this study, Aiken et al completed a cross sectional analysis collected from 10184 nurse surveys. Data for the study included discharges of 232,342 patients from 168 hospitals who were discharged between April 1st, 1998 and November 30th, 1999. Patients were selected from three surgical service lines including general surgery, orthopaedic and vascular surgery. Outcome measures for this study included risk

adjusted patient mortality and FTR within 30 days of admission. The study also reviewed the level of self-reported nurse dissatisfaction with their job and nurse burnout.

The researchers found that there was a significant impact on morbidity and mortality following complications related to the level of nurse staffing. In their study, Aiken et al. noted that the odds of patient mortality increased by 7% for each additional patient above the nurse to patient ratio of 1:4 (OR 1.07; 95% CI, 1.03-1.12). The researchers indicate that increasing the number of registered nurses may decrease the mortality rates. This is noted to be especially important in light of patients who has complications. It is also important to note that within this study, nurse surveillance was described as necessary for the early detection and prompt intervention when a patient's condition begins to deteriorate (Aiken et al., 2002). To be effective, the total number of registered nurses must be adequate to enable appropriate patient assessments on an on-going basis. This is an important finding since this body of research relates nurse staffing to mortality that is separate from other studies that suggest nurse staffing impacts mortality as a result of hospital characteristics including ownership, teaching status and/or anesthesiologist direction (Aiken et al., 2002).

More recent research by Aiken, Shang, Xue and Sloane evaluated the relationship between the use of agency nurses (used as supplemental staffing) on mortality and FTR. In 2013, Aiken et al. reviewed data from 40,356 nurses collected from 665 hospitals covering four states. The states included California, Florida, New Jersey and Pennsylvania. Combined the states used in the study make up nearly 25 percent of the of all hospital admissions in the country (Aiken et al., 2013). The intent of the study was to

examine the relationship between the number of agency nurses used and outcomes from the general surgical population. Data from the American Hospital Association from 2006 was used.

The patient outcomes that were measured included 30 day in-hospital mortality and 30 day in-hospital failure to rescue defined as a patient death within 30 days after a post-operative complication. Independent variables used in the study included the total number of agency nurses used in a hospital, the nurse practice environment (measured by the Practice Environment Scale of the Nursing Work Index (PES-NWI), the average workload of each nurse and the level of nursing education. Both hospital and patient characteristics were controlled for in the study.

Of the total sample size of all nurses, 2,750 (7%) were identified as agency nurses. In the study, 263 hospitals (40%) used less than 5% agency nurses, 277 hospitals (41%) used 5-15% agency nurses and 125 hospitals (19%) used more than 15% agency nurses. Aiken et al. noted that those hospitals using less than 5% agency nurses also had higher nurse to patient ratios.

The researchers found that a 10% increase in agency nurses was associated with a 5% increase in 30 day in-hospital deaths and FTR (OR=1.05 both mortality and FTR). However, secondary analysis that controlled for the nurse work environment, the use of agency nurses on mortality and FTR was insignificant (OR=1.03 for mortality and 1.02 for FTR). The researchers noted that the agency nurses were well qualified to care for surgical patients. The researchers concluded that mortality and FTR may be impacted by

poor nurse work environments that require a higher level of agency nurses to maintain adequate staffing levels.

In 2014, Talsma, Jones, Guo, Wilson and Campbell conducted research into the relationship between the level of nurse staffing and FTR. Talsma et al. noted that prior research reviewed single site hospitals and/or single year data that limited the ability to generalize the findings. In their research, Talsma et al. reviewed nurse staffing on the impact of FTR from a multi hospital perspective that included data that were collected over a multiyear period. The researchers conducted their research from and ICU and non-ICU perspective.

The study completed by Talsma et al., included data over a three-year period from 2003 to 2006. A total of seven hospitals were included in the study, with bed capacity ranging from 60 beds to 880 beds. All participating hospitals were located in Southeast Michigan from both urban and suburban areas. Included in the study were teaching and community hospitals. The researchers collected data using the Agency for Healthcare and Quality (AHRQ) patient safety indicator (PSI). All acute care cases were considered after meeting inclusion criteria. Nurse staffing data were collected from administrative management reports on the unit level.

The sample size totaled 19,313 patients. The sample was designated as medical and surgical discharges. Of the total sample size, 4473 patients were medical discharges with a FTR mortality rate of 9% and 14840 surgical discharges with a FTR mortality rate of 9.7%. Discharges included 93.9% discharged from general units and 6.1% discharged from the ICU. The researchers noted that the majority of expired cases (84%) had a

classification indicating an extreme risk of mortality compared to only 33% of survived cases being classified in the same way.

The researchers note that many patients identified as FTR also have high risk complications and complex morbidities. It is interesting to note that the researching acknowledge that the severity of illness may be so complex that even increased staffing may not have had a positive influence on the patient's outcome (Talsma et al., 2014). The researchers also noted that 49.5% of patients identified with FTR had illnesses that were present on admission (POA) and noted to be community acquired and not hospital acquired. The research validates the importance of early identification and treatment for successful outcomes. The researchers noted that patients who arrived to the emergency room and admitted with complications did better than those patients who acquired complications as an inpatient. In their findings, the researchers found that this risk adjusted study, using multilevel logistic regression did not support a relationship between unit level nurse staffing and FTR mortality in ICU and non-ICU settings (Talsma et al., 2014).

Delays in Treatment

Prompt administration of antibiotic treatment for the septic patient is key to improved outcomes (Band et al., 2011; Femling et al., 2014; Studnek et al., 2012). Recent studies have demonstrated that for every one-hour delay in treatment with antibiotics the increased risk of poor outcomes increases by 3-7% (Seymour et al., 2017). In their study reviewing delays from first medical contact to antibiotic administration, Seymour et al. in

2017 completed research that evaluated the association between delays in antibiotic administration and in-hospital mortality for patients with community acquired sepsis.

The study was a retrospective study using data from 21 EMS agencies and 9 hospitals between January 2010 to December 31, 2012. The EMS service providers were considered equal in that all agencies received medical oversight from faculty at one academic center with a single electronic health record capturing the same data in the same manner from each EMS service provider.

To be eligible for this study, participants had to be at least 17 years old and transported to one of the study centers via ground EMS. All eligible study participants had a diagnosis of community acquired sepsis. In this study researchers defined community acquired sepsis as "instances in which encounters met criteria for suspected infection and organ dysfunction within 24 hours of ED arrival according to the Third International Consensus Sepsis Definitions" (Seymour et al., 2017, p 760). The researchers defined the first medical contact as median time at beside or arrival to hospital (Seymour et al., 2017).

A total of 58,934 encounters were reviewed. Of this group, 2,683 patients met study criteria. The median time for first medical contact to the administration of the initial antibiotic dose was 4.2 hours. This delay included a prehospital arrival median delay of 0.52 hours and an ED median delay of 3.6 hours. EMS delays were decreased if the ambulance was traveling with light and sirens engaged. Delays of 0-6 hours had an unadjusted mortality rate of 10%, for 6-12-hour delay there was a mortality rate of 11% and a delay greater than 12 hours noted an unadjusted mortality rate of 14%. No

significant differences were noted based on age, gender, comorbidities or limitations with life sustaining measures.

The researchers concluded that there was an association between the delay of first medical contact and antibiotic administration and in-hospital mortality. The researchers noted that controlling for other risk factors, delays in first medical contact was related to an increase in hospital mortality (OR_{death} 1.03, [95% CI, 1.00-1.05] for every hour delay, $p< 0.01$. Similar findings held true for hourly delays in receiving emergency care once arrived to the ED ($p =0.04$). No significant findings for prehospital delay were noted ($p=0.61$).

The study reaffirms guideline criteria that indicates the administration of appropriate antibiotics may have a positive impact on patient outcomes for those with sepsis. The findings suggest that health care organizations should examine and establish interventions that will decrease delays in first medical contact and initial antibiotic therapy to improve patient outcomes for those with community acquired sepsis and decrease mortality rates.

Nursing Surveillance

Nursing surveillance has been described as the purposeful and ongoing acquisition, interpretation and synthesis of patient data for clinical decision making (Brier et al., 2014). Nursing surveillance is much more complex than simply monitoring the patient on rounds or when administering treatment or medication. Nursing surveillance is specifically intended to identify changes in the patient condition that may be grossly apparent or subtle changes that appear to evolve over time (Seymour et al., 2016).

The recognition of physiological changes found early with appropriate nursing and medical intervention may avoid serious complications during a hospital stay (Seymour et al., 2016). Within the acute care setting, the concept of nursing surveillance is defined within an individual and patient specific context. The nurse develops a framework to understand the physiological, emotional and environmental changes that may impact the well-being of the patient. This framework is developed by using both cognitive and interpretive processes. Observing, planning and preparation to implement appropriate interventions are necessary to promote patient safety and wellness (Brier et al., 2014). The core concept of nursing surveillance is the ability to identify at risk and deteriorating conditions, seeking appropriate interventions and rescuing the patient from harm (Seymour et al., 2016; Brier et al., 2014).

A body of research dating back 20 years exists describing to the role of nursing surveillance and its impact on positive patient outcomes related to successful early intervention. There is however, little known research that regards nursing surveillance and sepsis specifically. A recent descriptive exploratory research design by Pfrimmer, Guthmiller, Lehnam and Rhudy (2017) attempted to explore how surveillance was expressed by critical care nurses. The study was a descriptive, exploratory study design using the think-aloud method to collect data. Think aloud is the act of saying out loud whatever the nurse was thinking at certain points of care for their patients (Pfimmer et al., 2017). Data collected from the nurse using the think-aloud method occurred at three different stages of patient care during the shift.

The study was conducted in three critical care units at a large academic medical center in the Midwest. The three ICUs included the medical ICU, thoracic/vascular ICU and the medical/surgical transplant ICU. The total number of beds combined from the three units equaled 65 beds. Inclusion criteria for patients within the study included adults greater than 18 years old, admission to the ICU and expected length of stay greater than four hours. Exclusion criteria included end of life care, those patients with suicidal ideations, prisoners and those patients with exceptional family dynamics.

Nurses that provided patient care and were included in the study were also required to meet inclusion criteria. The nurse must have been caring for an ICU patient, employed as a nurse on the study unit for at least six months, completed a unit orientation and able to care for patients independently. Nurses were excluded from the study if they were float staff, or if they were responsible for orienting a nurse to the unit during the study shift.

A total of 21 nurses participated in the study. The nurses were interviewed at three points during the shift. The first interview occurred at the beginning of the shift during hand-off. The second interview occurred during the initial patient conducted by the nurse. The final interview occurred after a four-hour period into the shift. In the study 67% of the participants were female with a mean age of 40.7 years. The average critical care experience was 12.3 years. Of the nurse participants, 76% had a bachelor's degree, 24% had an associate degree and one nurse was a master's prepared nurse.

Five themes emerged from the study: (1) **Finding meaning** was recognized as the nurse's ability to interpret and synthesize information, creating a mental image of the

patient and identifying missing information that provided the complete picture (2) **Knowing the patient** allowed the nurse to access a baseline of the patient's condition that was derived from previous encounters with the patient (3) **Shared understanding and decision making** occurred during handoff whereby the nurses developed a shared understanding and decision making during handoff (4) **Thinking ahead** provided reference for not only thinking in the moment but also determining the longer term needs of the patients; and (5) **Unanticipated findings** that revealed the number of interruptions during handoff. These interruptions resulted from activity on the unit, family presence, testing and questioning. Interestingly, the most nurses did not comment on or seemed bothered by the interruptions.

The authors noted that nursing surveillance is not a single interaction of episode between the nurse and patient, but rather that single patients are cared for by multiple nurses over time. The importance of this study identifies nurse surveillance as cumulative with information being shared during specific periods of care. The shared analysis and synthesis of information culminated in the change of shift handoff (Pfimmer et al., 2017).

Research completed by Fasolino and Verdin in 2015 focused on the level of nursing surveillance and evaluation of physiological signs to indicate the clinical deterioration of a patient. The purpose of the study was to understand the trending and documentation of physiological measurements that included blood pressure, heart rate, oxygen saturation, mental status, respiratory rate, Glasgow Coma Scale (GCS) and urinary output. Data were collected 24 hours prior to the initiation of a Rapid Response

Team (RRT) intervention. The authors note that RRT is an extension of nursing surveillance that has demonstrated improved patient outcomes (Fasolin & Verdin, 2015).

The design of the study was a retrospective chart review of patients who had a documented RRT call during 2009. Specific units were designated to be included in the study, and only patients from those units who had an RRT call were included in the study. The units were medical-surgical units from a 245 bed not for profit acute care hospital located in South Carolina.

The average age of the participants in the study was 69.5 years with a range between 32 and 97 years. A number of chronic conditions were noted within the patient sample. These included heart failure, coronary artery disease, chronic obstructive pulmonary disease, diabetes, hypertension and chronic renal disease. The frequency of physiological monitoring ranged from one time to more than 20 times. Depending of the time of day and shift, frequency ranged from 3.67 to 6.39 times.

The researchers noted that nurses who used subjective processes to identify deteriorating patients also noted changes in the heart rate and level of oxygenation measured as SpO_2. The researchers noted significant variances in the documentation of physiological measurements during the time intervals which prompted the researchers to seek clarification from administration around the expectations of monitoring. The researchers concluded that nursing surveillance is a complex responsibility that requires a high level of awareness of clinical changes noted within the patient's condition to improve the patient outcome. Also noted was the impact that heart rate and SpO_2 had on identifying patient deterioration.

The literature review included failure to rescue from a surgical perspective and the impact on nursing resources, mode of arrival to the emergency department for care and delays in treatment of the septic patient. Given the presence and responsibility of the delivery of nursing care, nursing surveillance was also reviewed. All of these components of the literature review provide a framework for understanding the history, impact of care and relationship of medicine, nursing and processes/structures related to the on-going concern and treatment for successful patient outcomes of the septic patient. A model is required to inform this research. The Quality Health Outcomes model will inform the study and is described below.

Quality Health Outcomes Model

In 1966, Avedis Donabedian developed a framework of structure, process and outcome to evaluate methods for assessing the quality of medical care at the level of physician-patient interaction (Donabedian, 1966). In his landmark work entitled "Evaluating the Quality of Medical Care", Donabedian set the stage for medical evaluation of care. The work by Donabedian described a linear process that make assumptions of the impact of structures on the process of care and in turn the outcomes of patient care.

In 1988, Mitchell, Ferketich and Jennings proposed a model adapted from Donabedian's work and Holzemer's extension of Donabedian's model to include the relationship of additional factors that impact the quality of care and patient outcomes. The Quality Health Outcomes Model (QHOM) notes that there is no single direct connection that specifically links interventions to outcomes as in Donabedian's model.

Rather, the QHOM indicates that interventions affect and are affected by both systems and client characteristics in producing desired outcomes (Mitchell et al., 1998).

Impact of Systems

The focus of the Quality Health Outcomes Model (QHOM) rests on the notion that outcomes are impacted by the reciprocal directions of systems and the patient. That is, the direction is not linear as noted by Donabedian's model. Rather, the outcomes result from dynamic processes that involve systems and patient synergies. There is no single intervention that is responsible for the patient outcome. Desired outcomes are a result of the impacted of the system and the patient working in collaboration with one another to optimize patient outcomes (Mayberry and Gennero, 2001).

The QHOM also recognizes the contributions of nursing interventions and care delivery systems in relation to the impact of patient outcomes. The QHOM includes the nursing structure of care and the processes involved with the delivery of that care (Mitchell et al, 1998). The patient interacts with many components of the delivery of care as noted by the QHOM. Outcomes are related to several factors. The level of function of the patient is impacted by the delivery of nursing care. The establishment of the connection of the nurse patient relationship, the level of readiness of the patient to receive care and the degree of function are all interconnected and impact the degree of success of patient outcomes.

Also noted is the relationship among social interactions with friends and family as a support system to improve the level of function or outcome of the patient. The relationship of the patient and the interactive relationship between psychological,

physical and physiological aspects of health and illness impact patient outcomes (Mitchell et al., 1998). A number of studies use the QHOM as their guiding framework to inform their studies.

Quality Health Outcomes Model as a Guiding Framework

A study by Gilmartin Pogorzelska-Maziarz, Thomspon and Sousa in 2016 set out to test the QHOM regarding the relationship between health care-associated infection (HAI) prevention interventions, context of the organization and HAI outcomes. A secondary data set analysis was completed. Data were retrieved from 614 hospitals that participated in the Prevention of Nosocomial Infection and Cost-effectiveness -Refined study (P-NICER). The P-NICER study was a three-year study that surveyed National Health Safety Network (NSHN) hospitals.

A survey was sent to participating hospital infection preventionists (IP) to evaluate the adherence rates of the central line associated blood stream infection (CLABSI) bundles from their largest ICU, and the perceptions of the climate and work environments of these units. A total of 1013 surveys were sent. A response rate of 29% was achieved.

The findings from this study suggest there was partial support for the QHOM. The study was able to identify that high levels of adherence to the central line bundle interventions had a relationship with high levels of organizational content. There was not support however for the relationship of organizational context and CLABSI outcomes. The authors of the study concluded that the QHOM provided a framework to select variables that can be used to evaluate and compare health quality initiatives.

A second study that used the QHOM as their theoretical framework was conducted by Mallow, Theeke, Whetsel and Barnes in 2013. This research was intended to test the effectiveness of a Diabetes Group Medical Visits (DGMV) compared to the traditional and usual care of diabetics as it relates to low income patients who receive their care at a free clinic. This was a retrospective chart review of 111 charts. Cohort groups were established. One group had 53 participants attending the DGMVs and 58 who received usual care. Those in the DGMV cohort received up to six DGMVs that included education (blood glucose monitoring, medication, nutrition, medication, exercise foot care, heart disease, complications and behavior changes). The cohort receiving usual care had vital signs collected, history and physical exam, medication adjustments, referrals, laboratory procedures and education related to general care. Usual care did not include education provided by pharmacists or group diabetes education.

Inclusion criteria included age of 18 years old and older, having a diagnosis of diabetes and uninsured receiving care at a free clinic between May 2007 and August 2009. Of all participants, 73.9% were female, 95.5% were white and 53.2% were under 50 years old. The average BMI was 37.7 with a standard deviation of 28.48. The study took place in a North Central West Virginia free clinic.

The authors used the QHOM model as a framework using the four major concepts of system, intervention, patients and outcomes. The authors noted that the QHOM proposes that interventions affect and are affected by the system and patient characteristics producing desired outcomes (Mallow et al., 2013). The authors concluded in their study that although DGMVs have been shown to improve outcomes, this

particular study did not demonstrate improvement. The authors postulate that the culture and lack of health care insurance may have impeded the ability to demonstrate a biophysical improvement with this study group. Recommendations include the improvement to access of care, additional services of social work or behavioral health, use of technology, patient and family interventions and assessment for readiness for change may improve outcomes with similar populations using DGMVs.

A third study by Rowlands in 2012 also used the QHOM to "conceptualize patient safety in perioperative nursing and to identify key variables for the study" (Rowlands, 2012, p 273). The author chose the QHOM due to the interactions that occur in a reciprocal fashion among the systems, patient, interventions and outcomes as described in other studies. The purpose of this study was to determine factors (nurse and patient characteristics, intraoperative circumstances and staff involvement in procedures) that were associated with an incorrect surgical count.

The study was a cross-sectional, correlational study abstracting data from 100 medical charts that identified incorrect surgical counts after surgery. The study was completed in two hospitals. A level one trauma center that was also an academic medical center with 600 beds. The OR had 27 surgical suites and over 18,631 surgeries performed in 2008. The second facility was a not for profit community hospital with fewer than 150 beds with an OR that had seven surgical suites with annual cases of 6593 cases performed in 2008.

Data review identified 1122 procedures that met inclusion criteria (procedures performed in the main OR) and exclusion criteria where procedures had no primary

perioperative nurse. In total 65% of the procedures came from the academic medical center and 35% from the community hospital. Logistic regression analysis was used to examine relationships of explainable variables and incorrect surgical counts.

Within this study, the researcher was able to identify the odds of incorrect surgical counts based on three identified domains. These included patient characteristics, intraoperative circumstances and the level of involvement of the staff. The researcher was able to identify six variables that were associated with an occurrence of an incorrect surgical count. These included level of surgical risk, lower BMI, unplanned and complicated procedures and an increase in staff involved in the OR and/or specialty teams. The researcher was not able to find evidence of the relationship between characteristics of the primary perioperative nurse and an incorrect surgical count (Rowlands, 2012).

Choosing the QHOM

Health services research is still influenced by the model developed by Donabedian in 1966. The framework designed by Donabedian is a linear model that is focused on structure, processes and outcomes. The model maintains a rigid direction with structure always first, processes second and outcomes last. Donabedian applied his model to the physician patient dyad (Donabedian, 1966).

Donabedian describes structure as the physical structure where care is delivered, the equipment and people who provide services to the patient. Donabedian describes the elements of structure control the actions of the providers of care and the patient. The process component of Donabedian's model is a summary of all that is healthcare. This

includes the diagnosis, treatments, education regarding illness and recovery, preventative care and the influence of the home and family (Donabedian, 1966). The processes are described as the delivery of care which are broad.

Donabedian's model was specific to the physician patient relationship. Although Donabedian does imply that staff and training impact the experience and outcome of the patient, there is little discussion regarding the importance of nursing care and interventions to achieve optimal patient outcomes. The impact and importance of nursing surveillance is becoming more evident in the research literature.

The QHOM is an adaptation of Donabedian's model. The QHOM suggests that relationships are bi-directional and not linear as is suggested by Donabedian's model (Mitchell et al, 1998). The model noted as a dynamic model by Mitchell, Ferketich and Jennings suggests that the QHOM is more closely aligned with patient care and outcomes and it is important to capture the contributions made by nursing and nursing interventions on patient outcomes and the delivery of care (Mitchell et al., 1998).

The QHOM suggests that outcome measures are a result of care structures and processes. In the body of their work, Mitchell et al. describe the integration of functional, social, psychological, physical and physiological indicators of wellness. In addition, outcome measures should focus on health promotion, quality of care, self-reliance and management of symptoms (Mitchell et al., 1998). Although these outcomes measures are not exclusive to nursing, the scope of nursing practice include all of the outcome measures described by the QHOM. The flexibility of the QHOM and the inclusion and

recognition of the significant contributions of nursing in the model make it a strong choice for the purpose of this work.

Summary Chapter II

Failure to rescue was first introduced in 1992 when researchers began to review death of patients from unanticipated outcomes during surgical procedures. These studies established that differences existed regarding hospital and patient characteristics that impacted patient outcomes. In addition, the level of training, or board certification of specific physician groups (anesthesiologists) and identified comorbidities may have an impact on the patient outcome. These studies were targeted towards medical providers and patient outcomes.

A shift away from medical provider impact on failure to rescue began to occur when researchers began to look at the impact of care, in particular nursing care (or lack thereof) and the impact on patient outcomes and failure to rescue. These studies identified that nursing skill, level of nursing practice and available nursing resources played a role in the ability to adequately monitor and intervene with changes that may occur during a patient's stay in hospital. From this research, other studies began to surface that specifically studied the effectiveness of nursing surveillance that provided 24-hour patient care. Nursing surveillance acts as the level of protection for patients that is intended to identify in a timely manner any changes in condition that may be an indication that the patient requires closer observation and immediate attention and possibly intervention to prevent an adverse outcome.

Early work related to FTR concluded that patient outcomes were based primarily on hospital characteristics, including the size of the hospital and level of technology. The focus on patient outcomes were primarily associated with surgical patients and the skill or credentials of the medical staff with little to no mention of the impact of nursing care on FTR and patient outcomes (Silber et al, 1992; Silber et al., 1995; Silber et al., 2002). Much of the early work on FTR was completed by Silber who is credited for the development of FTR studies. This oversight may be a consequence of the overarching impact Donabedian's model of structure, process and outcomes had on medical quality beginning in the 1960's, focusing specifically on the patient physician relationship as a core principle of health.

Beginning in 2002, researchers began to study the impact of nursing care on FTR and patient outcomes. Nursing measurement models evaluating hours per patient day (HPPD) and nurse to patient ratios were studied to better understand what role and impact nursing resources had on patient outcomes (Aiken, et al., 2002; Aiken et al., 2013; Needleman et al., 2002; Talsma et al., 2014). Research literature supports that more nursing resources has a positive impact on decreasing length of stay, mortality, urinary tract infections and bleeding (Aiken 2002; Needleman 2002). In studies by Needleman et al. and Aiken et al. it was demonstrated that increasing nursing resources has a positive impact on hospitalized patients (Aiken et al., 2002; Needleman et al., 2002).

This review of the literature also documents opposing views on the impact of nurse staffing and the impact on FTR and patient outcomes. Specifically, in 2013 Aiken et al. began to focus on the work environment and staffing needs requiring the use of

agency nurses. The research noted that the units studied may have had a poor work environment that necessitated the need for agency nurses as supplemental staff. It was interesting to note that patient outcomes were not impacted by agency nurses.

The research of Talsma et al. in 2014 began to question the impact of nurse staffing on FTR mortality. In their research, Talsma et al. using logistic regression found no support between nurse staffing and FTR mortality, however the researchers did validate the need for a high degree of nursing surveillance to provide early identification and treatment for successful outcomes.

Improving patient outcomes is contingent upon adequate nurse staffing, enhanced nursing surveillance and quick action on the part of the nurse and medical team to identify and treat changes in patient conditions to avoid harm by FTR. The research clearly outlines the impact of the hospital environment, nurse staffing, timely interventions and appropriate plans to positive impact the outcomes of FTR (Aiken et al., 2002; Aiken et al., 2013; Needleman et al., 2002; Silber et al, 1992; Silber et al., 1998; Silber et al., 2002; Talsma et al 2014).

Gaps in the literature have been identified. While research has been conducted on nurse staffing and FTR, there is little research that focuses specifically on FTR related to nursing surveillance of the septic patient. Sepsis continues to be an elusive condition with a high mortality rate when the condition cascades into multi-organ failure. Nursing plays a crucial role in the assessment of physiological changes and clinical data, prompt notification and intervention to improve outcomes for patients with sepsis. The focus of this research attempts to address these gaps by increasing our understanding of nurses'

knowledge of nurse surveillance of the septic patient as well as identifying any barriers to implementing comprehensive surveillance plans for the septic patient.

CHAPTER III

METHODOLOGY

Purpose

The purpose of this study was to (1) explore nurses' knowledge of nursing surveillance as it pertains to the septic patient and (2) to describe any barriers to successfully implementing a comprehensive nursing surveillance plan. This chapter describes the methodology of the research including research design, setting, description of the sample and data collection and analysis.

Research Design

This study used a qualitative descriptive approach. A qualitative descriptive design allows for freedom from the traditional qualitative inquiries including ethnography, phenomenological, grounded theory case study and other narrative approaches (Sandelowski, 2000). A qualitative descriptive inquiry provides for the opportunity of a comprehensive summary of the thoughts, feelings, and understanding expressed by the participants. The uniqueness of the qualitative descriptive design allows for a naturalist approach to the study, that is the researcher does not attempt to manipulate or interfere with the unfolding of events (Colarafe & Bronwynne, 2016).

Focus Group Methodology

This qualitative descriptive study used a focus group approach. Kreuger and Casey (2015) state that the use of focus groups is appropriate if the researcher is looking

to gather a range of opinions, perceptions or feelings people may have about a specific topic. These topics may range from behavioral issues, policies, procedures or identification and deeper dive into issues that may have arisen in group or individual discussions. Focus groups allow researchers to uncover influential factors, insights into complex and difficult topics and the potential to better understand the differences in perceptions and perspectives that are discovered during the focus group. Shaha, Wenzel and Hill (2011) also stated that focus groups are especially useful in studies of nurses as moderated focus group discussions allow research participants to exchange and discuss opinions, attitudes, and experiences surrounding a shared topic.

Setting

The study took place in a community hospital as part of a large health system located in the Piedmont region of North Carolina. The health system serves several surrounding counties and consists of multiple hospitals, including rural and urban facilities. Focus group data were collected in private conference rooms in these hospitals.

Sample and Recruitment

A hallmark of the qualitative descriptive design is the ability to utilize a sampling method deemed appropriate by the researcher (Sandelowski, 2000). Purposive sampling was used in this study. Purposive sampling is a type of non-probability sampling which allows the researcher to seek participants who can provide the richest data pertinent to the study's purpose.

The sample for this study included registered nurses working in acute care areas in one hospital system that admit and care for septic patients. Recruitment of study

participants began after obtaining IRB approval from UNC Greensboro as well as the hospital system. After first obtaining approval from executive nursing leadership to begin recruiting, a general email to all nurses who work on acute care units which admit septic patients was sent. Within the body of the email a general description of the study purpose, data collection strategy (focus groups), and time commitment, as well as information on how to contact the researcher to participate were included. In addition, study information and a flyer was provided to the hospital wide shared governance council and unit based council describing the study and a request for participation from nurses working in acute care areas. Study information was posted in strategic areas often visited by nursing staff (breakroom, cafeteria and education centers) to increase exposure to the study and increase participation. Registered nurses interested in participating in the study were asked to contact the researcher by phone, email or private conversation.

Focus Group Recruitment

Permission was sought and received from the organization with the Chief Nursing Officer (CNO) regarding the qualitative study. The investigator sought and received IRB approval from the University of North Carolina Greensboro (UNCG). The study was provided exempt status. Once IRB approval was obtained by UNCG, IRB application for the organization was completed. All documentation including permission from the CNO of the organization was sent to the appropriate committee members of the IRB for approval. The IRB application was reviewed and approved.

A flyer was produced and placed strategically within the organization for placement in areas known to have significant foot traffic allowing the information to be

available for review. A presentation to the Department Directors was also conducted to inform the leaders of the purpose of the study, desired level of participation, intent and benefit of the study. A presentation to the hospital wide shared governance committee was also completed. Information was provided to the shared governance committee related to the purpose, participation, intent and benefit of the study. The hospital wide shared governance committee (SGC) is made up of bedside nurses who represent the inpatient units. The SGC also includes nurses from the Emergency Department, Mother Baby service line, operative services and procedural areas.

To protect the identity of individuals participating in the focus groups, no names were used. The individuals in each focus group were identified as participant to maintain confidentiality. The groups began in a similar fashion. That is more probing questions or cues were required to get the conversation going at the beginning of the focus session. Once a participant took the initial step to begin the discussion the other participants followed suit. Those participants who appeared less inclined to participate in the discussion were often newer nurses to the profession or the unit. These participants were given unique opportunities when called upon using the probe "as a new nurse, what is your experience …?". This approach appeared to provide the new nurse participant a non-threatening opportunity to join the conversation given their unique perspective. Each focus group was made up of participants that worked on the same nursing unit. This provided an additional sense of belonging and purpose for those who were comfortable engaging in the conversation. The group demonstrated support for all members within

their focus group. The study occurred in one community hospital facility that is part of a regional health system.

Inclusion Criteria

To be included in the study, focus group participants had to be Registered Nurses (RN) licensed in North Carolina. The RNs must work or have worked in an inpatient nursing unit where patients with a diagnosis were admitted. Participants in the study had a minimum of six months experience caring for septic patients. This inclusion criteria were used to ensure the participant had the experience required to be able to answer questions regarding nursing surveillance of a septic patient (Chan, Jones & Wong, 2013).

Demographics

The focus group participants were all registered nurses. The total number of participants was 29. The mean years of experience was 7.08 years. The median years of experience was 5. Standard deviation was 5.67 years of experience. Educational background of the participant group noted 25% with associate degrees, 68% Bachelor of Nursing degrees and 7 % with master's degrees both in Healthcare administration (MHA). Of the 28 participants, 46% acted in the dual role of bedside care nurse and charge nurse. Two of the nurses in the group were male.

Managing the Focus Group

Prior to the launch of the focus groups, the researcher worked with a master's prepared nurse to establish criteria for management of the focus groups. The launch plan included the use of field notes to be used with each focus group. Field notes are used to

guide the conversation. With the field notes in this research study, the hope was to capture word for word conversations to allow for analysis later (Kreuger & Casey, 2015). The field notes document and the expectation of use of the field notes was outlined by the researcher and verified by the associate moderator. The role of the researcher was to ask all questions, provide probing questions if needed and encourage the group to participate if there was a lull in conversation. Each focus group was designed in a similar fashion. All groups met in a conference room. All questions were asked in the same order. Probing questions varied dependent upon the direction of the conversation.

The associate facilitator worked with the researcher to capture the essence of the conversations in the field notes. A standardized field note form was developed by the researcher and used by the associate facilitator. The intent of the field notes was to capture direct quotes, non-verbal cues by the staff and any other interesting facts. The associate facilitator did not ask any questions specifically of the group. Clarification that was required was requested of the group by the researcher. Field notes were reviewed and incorporated into the data analysis.

Human Subject Protection

Prior to recruitment of participating registered nurses, approval was sought from the University of North Carolina Greensboro (UNC-G) Institutional Review Board (IRB) and the Research Council and the IRB of the Health System. Participants were provided information related to the study and the intent of the study as partial fulfillment of the PhD requirement for the researcher. Prior to data collection, risks were explained to each participant. Participants were aware of the risks of participating. Specifically, while

participants will be assured their identities would be protected in all disseminated study findings, the researcher cannot assure that focus group participants will not share what was discussed outside of the focus group. The researcher reminded participants at the beginning and end of each focus groups to maintain confidentiality of all conversations. Participants were provided with a copy of the signed consent. The researcher will maintain a copy in a secured confidential file separate from study data. All explanations related to the study, the IRB recommendations, limitations and expectations were carried out by the researcher.

Interview Questions and Prompts

Kreuger and Casey (2015) state that establishing questions for focus groups that are appropriate and relevant are important for the success of the research project. The questions should use open ended questions and words that encourage participation from the group. Questions should be clear and short within one topic or frame to encourage discussion with some purpose. The questions must also be clear and have the same meaning for the group. For example, the use of useful and practical in the same sentence may confuse members of the group with the intent of the question.

Kreuger and Casey (2015) state that there are several steps to the questioning route. The opening question has a specific purpose. That is to have each member of the focus group to begin to speak early in the conversation. For example, in this study the opening question asked how many years the nurses have cared for septic patients. This introductory question introduced the topic and allowed for the focus group participants to begin to think about their experiences and connections with the topic. Transition

questions then moved the conversation into the direction of the purpose of the study. Transition questions are logical links between introductory questions and key questions (Krueger & Casey, 2015). The purpose of the transition questions allows the focus group to begin to discuss the topic in more detail moving the conversation into the next component- key questions.

Key questions are those that drive the study. In this study, the key question is "what is nurses' knowledge of nurse surveillance". The intent of the question is to begin to fully understand the level of understanding by the group as it relates to nursing surveillance. In this study, the key questions seek to identify the level of knowledge of nursing surveillance as a function of a loop paradigm that begins with the assessment of trends and data, connections with the patient and interventions with providers and the nurse. Given the important role of nursing surveillance as a function of the nurse, it will be important to clearly understand the perceptions of the group as it relates to nursing surveillance.

Ending questions provided closure to the discussion and provided an opportunity to determine the final position of the participants within the group (Krueger & Casey, 2015). The ending questions also allowed the researcher to understand the level of importance or weight to the discussion provided by the group as part of the analysis. The ending question will be was asked after the researcher had provided a short oral summary of the work and findings during the session.

The interview questions that guided this study included the following:

Q1. Tell me about your experiences caring for a septic patient.

Q2. Can you describe for me what nursing surveillance means to you?

Q3. Can you describe what is involved with initiating a bundle for the septic patient?

Q4. Tell me about your experiences regarding any barriers that might inhibit your ability to provide nursing surveillance for the septic patient.

Q5. At the end of your shift, how do you feel about the care you were able to deliver for your septic patient?

Q6. If you were asked by your leader what could we do to improve the care of the septic patient, what would you say?

Prompts were used after each question if the conversation became stalled. Prompts are used in qualitative descriptive inquiry to guide the study participant to keep the conversation going if needed. Prompts included the need to further describe the concept of nursing surveillance. Prompts were available to be used if needed particularly regarding the concept of nursing surveillance such as: (a) the act of collecting patient data during assessments including physiological, laboratory values or other data available (b) evaluation of trending data changes and/or being aware of these changes (c) reporting findings to providers (d) initiating orders and re-evaluating outcomes. These prompts are modelled after the components of successful nursing surveillance and follow the QHOM framework.

Field notes were written by the researcher during and after each focus group to capture any additional information, thoughts or findings that may present during the interview. This additional information may include but will not be limited to emotions that were presented by the participants, non-verbal cues or expressions, and any questions

or concerns raised. Field notes are captured immediately after the interview to ensure freshness in the principle investigator (PI) mind and to reflect the PI's thoughts about the interview (Kim, Sefcik & Bradway 2018; O'Brien et al., 2019). After each focus group interview recorded data were transcribed verbatim by the researcher into a written text. All transcriptions were listened to again with the written text in hand to assure accuracy and that all voices were captured.

Data Collection

A recording device was used to capture focus group discussions. At the beginning of each focus group the researcher reviewed a brief description of the study purpose to allow for any questions to be asked prior to turning the recording device on. Focus groups were expected to last 60 to 90 minutes (Krueger & Casey, 2015)

Data Management

Audio recordings were transcribed verbatim into a word document. The text was uploaded and stored in UNCG Box. The committee chair had access to the transcribed information for review and validity of the information secured. Hard copy consent forms will be secured in a locked file cabinet separate from any other study data.

Data Analysis

Data analysis for this research consisted of qualitative content analysis. Sandelowski (2000) states that content analysis is the strategy of choice in qualitative descriptive research. Qualitative content analysis is a dynamic process that seeks to analyze verbal data that intends to summarize the information provided by the participants within the study.

Kreuger and Casey (2015) outline content analysis steps to analyze data that are applicable to the findings from focus groups. The steps outlined begin with a systematic analysis of data collected. The systematic analysis is prescribed and sequential. The intent of a systematic analysis is to ensure findings reflect the information provided and shared among the focus groups.

Preparing the Transcripts

The transcript from the focus group is a verbatim written record of the discussions of each focus group. The information for the transcript is provided by the audio recordings that were captured during the focus group session. Formatting of the transcript is an important detail to provide a smooth process to navigate the document quickly. Krueger and Casey (2015) recommend that the moderator's content be bolded, capitalized and underlined for quick identification of the questions asked by the moderator.

Participant comments were single spaced. Separation of individual comments were identified by double spacing between speakers. Comments are transcribed verbatim. This includes any repetitive comments made by the speaker. When transcribing the audio recording there was no effort to change words or correct grammar. If words are not understood, they are identified by using three periods "…" to quickly identify the issue (Krueger and Casey, 2015, 150).

Analysis Strategy

According to Krueger and Casey, focus group analysis has four critical qualities: (1) it is systematic, (2) verifiable, (3) sequential and (4) consequential. Using systematic

analysis, the researcher followed a prescribed sequential process. Using such strategies allows the researcher to avoid mistakes or overlooking critical factors(Kreuger & Casey, 2015).

Verifiable analysis means that another researcher can take your data and arrive at similar findings. To verify these findings there must be sufficient data to provide a trail of evidence (Kreuger & Casey, 2015). This trail is constructed by the recordings of the focus groups, any field notes that may have been taken, and any debriefings that may have occurred. The transcripts themselves are also used to provide this trail of evidence.

The process of analyzing the data collected was sequential. The information that was collected was guided by the respondents of the questions. Groups were configured to obtain the type of analysis that was wanted in a way. In this research, nurses caring for septic patients were an appropriate group to measure the impact of nursing surveillance of the septic patient. Nursing surveillance is a nursing function.

Analysis of the focus groups was a continuous process. In qualitative studies using focus groups, analysis begins with the first focus group with collection and analysis being concurrent (Krueger & Casey, 2015). Writing short summaries, reviewing field notes and transcripts assisted with recognizing any gaps in the data.

Review of the Transcripts

After each session where an associate moderator was in attendance taking field notes, the interview session and field notes were discussed by the PI and associate facilitator. This debriefing provided an opportunity to discuss points of view related to the transcripts and field notes from the perspective of the investigator and the assistant

moderator. A review of observations and any opposing views were discussed and highlighted (Kreuger & Casey, 2015)

When audio recordings were completed, the contents were transcribed. Once transcribed a master copy was printed for redundancy and safekeeping. Transcripts were then color coded by focus group. Each transcript was read along with field notes and comments from the focus group sessions a total of four times. This permitted the researcher to become immersed in the topics of conversation and to recall the focus group meeting.

After reading transcripts, notes and comments, each question was separated. The responses to the questions from each focus group's participants were separated from the colored text. All groupings of question one was collated together and placed on a poster board on the wall. In the end there were six poster boards. Poster board one had six number one questions placed on the board all color coded. The same sequence was completed for question two to number six.

Coding

The next step in the analysis process was to code the inform that was gathered. In a structured fashion, all responses from question one was reviewed. The process involved reading and re-reading the responses from the focus group participants. Looking for the answer to the questions that was asked was the structure used in this process. Each response from different participants to the same question was evaluated. Responses that were similar were provided with a code. Responses that were unique or unrelated were

placed in a separate area to be reviewed at a later time. As the researcher moved through the question, several codes emerged.

The process was duplicated for questions two through six. Each grouped response that were similar were assigned a code for later review. This was completed with all responses to the questions asked. This is described as the constant comparative method (Kreuger & Casey, 2015).

Analytic Themes

When coding was complete, data were categorized to begin the process of developing themes. The constant comparative method provided the researcher an opportunity to envision developing themes within the body of the work. There were several concepts to be aware of with this process. These included 1) the frequency of the concept 2) how extensive was the concept. That is how many people described the concept. 3) How intense were the responses 4) specificity- how much detail was provided 5) internal consistency- were the participants consistent in their views and 6). Perception of importance- how important did this seem from the group (Kreuger and Casey, 2015).

Summary Chapter III

The purpose of this study was to examine nurses' knowledge of the role of nursing surveillance as it relates specifically to the septic patient using a qualitative descriptive approach. Specifically, focus group methodology will be utilized to collect data from registered nurses who have cared for sepsis patients. A semi-structured interview guide was used to collected data along with field notes recorded by the

researcher. Data were analyzed utilizing Kreuger and Casey's (2015) content analysis approach to focus group data. Findings will inform nursing knowledge on how to improve care of the septic patient.

CHAPTER IV

RESEARCH FINDINGS

The study was a qualitative study using focus groups. Data collection involved six separate focus groups. The participants in the focus groups were asked to reflect on experiences in caring for a septic patient, bundles of care for septic patients, and nursing surveillance. The study also gauged the perceptions of the participants in the focus groups in relation to barriers related to the care and implementation of bundles and care provided to septic patients. The focus group discussions ended by participants providing insights into areas of opportunity to improve care.

The use of probing questions and inquiry by the investigator for clarification or expansion of thoughts and ideas presented by the focus groups was used to generate data. These data provided the basis for the themes presented in this research. The researcher used a qualitative descriptive design. The responses provided to the questions asked by the researcher were evaluated using a descriptive analysis approach (Sandelowski, 2010). Qualitative analysis findings from the focus group data are presented. Five major themes surfaced which were: (1) mixed emotions, (2) lack of resources, (3) in the dark, (4) lack of partnership/respect and (5) knowledge deficit.

Sample

In this study, six groups with four to eight nurses in each group participated. The total number of participants was 28 registered nurses who had at least six-month

experience and had cared for a septic patient within the past year. All groups contained enough participants to meet the requirements of the study with four to ten participants in each group. Only one group had four participants with the largest group being eight participants. All participants were clinical nurses providing direct nursing care and a history of caring for septic patients.

Group One

This was the largest of the six groups. Each question was read individually with time provided for discussion and clarification requested by the investigator. The entire group participated in discussion with all questions, with some questions being more robust than others. More senior nurses within the group were often looked upon for guidance with responses by junior nurses early in the conversation. As the focus group discussions continued, all members became increasingly active in the group. This focus group interview lasted 46 minutes.

Group Two

The focus group members in group two were from a specialty area. This group of nurses were highly engaged in the discussion given all of their interest and roles within the unit to improve the outcomes of patients who are septic. There was particular interest with this group in the septic bundles and the evidence based practices regarding fluid management and the use of vasopressors to maintain an appropriate level of mean arterial pressures (MAP). This focus group lasted 48 minutes.

Group Three

This focus group was the smallest of all groups with only four members (one did not show). This group required more probing questions than other groups, however once the participants in the group began to participate, they provided some unique insights into the questions being asked during this study. This focus group lasted 44 minutes.

Group Four

The group provided interesting discussions regarding evidence-based practice and the potential for other modalities of treatment. These modalities were aside from the current and accepted bundle treatment currently in use. There was a strong connection with this group regarding teamwork and the ability to provide the level of care required given the complexity and resources required to meet the needs of the septic patient. The group was supportive of one another during the discussions. Each participant had similar views when discussing barriers and expectations of care. The focus group lasted 48 minutes.

Group Five

Group five provided information from a different perspective. These nurses float to most of the in-patient units within the organization. Group five was a highly engaged and vocal group that interacted seamlessly with the other members of the group. This group expressed frustration with the initiation of the bundle on all units that they are assigned. This group also provided insight from a global perspective regarding interdisciplinary relationships among providers. This focus group lasted 49 minutes

Group Six

Group six was a highly engaged group caring for high acuity and complex patients in the organization. This group has the unique perspective of working with providers that are based in their unit as well as providers who are not based in their unit but care for patients who are in transition to a lower level of care. This group focus group lasted 52 minutes.

Data Analysis

The investigator completed an extensive review of the focus group transcripts and field notes utilizing Kreuger and Casey's methodology (2015). Each transcript was read a total of four times in their entirety. The transcripts were then framed seeking to identify specific thoughts or ideas that could be reviewed for similarity with the responses of the other focus group members. When bulk framing was completed, the transcripts were dissected, and line by line coding was done looking for specific language or quotes that would support the themes that were developing. Table 1 presents sample codes.

The codes were organized and then collapsed utilizing the study purpose and theoretical framework. The QHOM suggests that outcome measures are a result of care structures and processes. The QHOM is a bidirectional model that incorporates processes of data being retrieved, analyzing the data and intervention by the medical provider for evaluation and treatment. Interventions are instituted by nursing and the process begins again. The process of surveillance and evaluation move on a continual basis. This bidirectional feedback system is dependent upon accurate knowledge and practice interventions to be successful.

Once the process of data review and breakdown into codes was complete, the researcher moved through the data to evaluate the emerging themes. The five themes that emerged were: mixed emotions, lack of resources, in the dark, lack of partnership/respect and lack of knowledge.

Table 1. Qualitative Data Analysis of Transcripts: Sample Identified Code

Focus Group Codes			
Frustrating	Scary	Forced	Unorganized
Drifted	Advocated	Time-consuming	Discouraging
Drowning	Discouraging	Stressful	Overwhelming
Chaos	Urgency	Intimidated	Failure
Lack of presence	Shutdown		

Themes

Mixed Emotions

The first question that was asked of the six focus groups was "tell me what it is like to take care of a septic patient"? The initial question was intended to be an ice breaker that would provide the participants of the focus groups an opportunity to provide insight into the question and to begin to feel comfortable in the study environment. It was apparent from the responses and non-verbal cues that this was a question that had a significant impact on the Registered Nurses (RN) who were participating in the study.

One participant indicated: Well it can be a little scary because you never know which way, they (the patients) are going if they are getting worse or better. It's hard to tell.

There was also a great deal of frustration with the amount of work that was required to care for a septic patient. It was noted that the care for a septic patient was "*time consuming", "too many lab draws"* and *"requiring a lot of monitoring".* In relation to being frustrated one focus group member said:

Sometimes it can be frustrating if you think they are going this way and you know they are going septic and the patient is in the early stages and you are trying to get the doctor to respond quickly and act upon things and they're like (the doctors) Oh Okay. You know give them a bolus in another couple of hours and you're like No! This is sepsis and we need to call a code sepsis and get things moving. It can be frustrating.

In another instance a focus group member said:

> I had gotten a patient who was septic up from the ED and I mean literally just got him moved from the stretcher to the bed. Lab is calling me because their second set of lactic acid had not been drawn and they were supposed to have been drawn sometime before he came up to the floor. So, they were frustrated with me and I'm like I literally just got the patient in the room

Other focus group participants discussed the challenges and concerns that impacted their ability to appropriately care for the septic patients. It was becoming apparent that all participants felt that the septic patient required a great deal of attention and specialized care that may not be available in a timely manner. Several examples were presented that indicated that the concerns expressed by the nursing staff did not only

apply to themselves, but also extended to the patients they were caring for. In one example a focus member said: I am frustrated for the patient himself because he kept saying that he didn't feel like something was right and he keep saying he felt like the doctor would come in and talk to him and not do anything or change anything.

Caring for septic patients is a labor-intensive activity. This was validated by the number of comments provided by the focus group participants. The patient who is septic requires IV fluids, lab draws in succession, antibiotics and close monitoring that may require transfer to a higher level of care. In one focus group whose participants admit a high volume of septic patients, there were descriptions of being overwhelmed. The volume of patients with sepsis being admitted to their unit was described as being very high. The focus group participants described having septic patients present in their unit every day. Several of the group members commented:

> They (septic patients) come in through the front door and back door , through the lobby sitting out in the lobby waiting to be triaged and EMS brings them in as fast as they can through the from doors.

> I feel like you look at a sepsis patient and you get like an automatic feeling like well I'm falling behind and I mean if you're alone with an EMS patient and you have to type the whole triage note and then do everything which doesn't happen that often but usually you have help but when you don't but when it is just you it is overwhelming.

> You know that you have the urgency of this is a sepsis patient we have to move like right now and we're getting timed and then you've got the call center, I can't think of the name right now, and they call and keep you and that call stresses me out because I want to beat that call. I don't want them to have to call me at all but when the do call it's like I failed at my job.

Lack of Resources

During the conversations with the focus group participants it was apparent that resources or lack thereof was of concern. Resources was described as adequate staff to care for septic patients given their complexity and labor intensive nature to deliver care. There were also discussions regarding the need for adequate staff to be supportive to decrease the strain on staffing resources when a septic patient arrives on the unit for admission. The septic patient requires a great deal of attention and care during admission. The nursing goal is to meet the needs of the patient and ensure safety during the transition in care.

The focus group participants described the impact of having a high patient to nurse ratio with the addition of a septic or other equally complex patient. The focus group participants felt that care is impacted either for the new septic admission or for the patients that are currently on the floor. Some of the comments included:

> We are so busy especially with a heavy patient load the number of patients that you have. For some people it's hard to catch those trends. It may be the nurse is so task oriented that because it is so busy that they cannot catch the white count going up over the shift.

Another nurse commented:

> Not only are the ratios too high, having other patients that already aren't doing well. So, you have a patient that you are focusing on that's not doing well and then you have this other patient that you think is going septic now and you have two unstable patients.

As the discussions continued with the focus group participants, it was clear that there was concern for the safety of other patients who were part of the nurses' assignment for that shift. The discussion suggested that this concern was first and foremost on the minds of the focus group participants. The discussion raised the point of high nurse to patient ratios and the inability to provide a high level of nursing care was a priority concern. Several of the focus group members commented:

> I think usually if you have a patient that is more sick than another patient then the patient care you are giving to the patients that are doing better you probably don't provide as good of care to them because you are focused on the ones that are having more issues.

Other focus group members commented:

> Unrealistic expectations and you are shortchanging your nurses. On the med/surg floors it is the nurse to patient ratio that some units right now are doing seven patients to one nurse that's a lot and you cannot monitor all of your patients.

There was an interesting phenomenon beginning to emerge during the focus group discussions surrounding resources as they related to staffing. The phenomenon was from the perspective of the charge nurse who expressed several concerns. The first was the inability to care for all of the patients adequately in her assignment while jointly being responsible for the CN role. Secondly, participants described the feeling of letting the team and other patients down because the CN was not able to effectively act as the CN with its supporting role to the staff while caring for a full patient assignment.

The charge nurses saw their roles as two fold. The charge nurses felt that they had overall responsibility for the unit and to be a presence for the staff nurses as a resource to assist in the provision of care. When the charge nurses had an assignment, they felt torn as to which function should be their priority.

Here are some of the comments from the charge nurses:

> I know for me when I mean I don't say this and try to help out as much as I can. But if I have , and the staff knows pretty much if the charge nurse has patients especially it's a full load then she's less helpful to you because her focus is her patients and she can't focus on the unit as a whole because now she has five or six patients and she's got to make sure that things get done. If we have our own patients our patients are our focus, so the unit gets less of a focus.

> When I have worked at other places where I feel like I've been able to provide adequate care. I just don't feel like I'm the nurse I should be or can be.

> I mean if you have a septic patient maybe thinking about trying to give that nurse a fewer nurse to patient ratio so you can take better care of that patient because sometimes they do require a lot more care and surveillance.

The charge nurses described feelings of being inadequate and hoping that patients were safe at the end of their shift. The charge nurses took this responsibility very seriously as part of their daily work and were burdened when they felt they could not provide a high level of care.

> You feel like at the end of your shift the patients are probably OK but you feel like you didn't given them, you short changed them a little bit or didn't provide the customer service that you are used to.

> It just makes me feel bad, just less than adequate I am frustrated I guess because I mean you're only one person.

Resources were not exclusive to staffing. The nurses in the focus groups provided many examples of barriers from ancillary departments. For example, lab specimens were not drawn in a timely manner which created a delay in reporting results. The administration of IV antibiotics cannot be initiated until the collection of blood cultures are completed. The focus group participants described delays with the pharmacy that occurred on a regular basis. Medication delays including antibiotics or vasopressors could have a significant impact with patient outcomes.

The sepsis bundle adheres to a tight and specific time frame to have labs collected and reported, IV fluids to be initiated and antibiotics to be started. The focus group participants discussed their frustration with the ancillary departments when they are delayed causing a chain reaction that leads to the timed measures being delayed. Timing of the initiation of the bundle is strict and results are reported. Several comments included the following:

> Well sometimes it takes 30 minutes just to get blood. I mean difficult stick patients especially like your dialysis or renal patients.

> There are times when almost an hour and a half later the labs are back and we are like Oh and we start the timer and it's like we already missed a lot of the time.

> It's like if you don't suspect sepsis from the beginning but you've drawn a lactic and they ordered it and it takes an hour for the result well your time is already gone.

> It's not so much frustration, it's kind of more like just frustrated that we missed it (time limit).

The focus group participants noted that the initiation of a code sepsis is closely monitored within the organization. The groups described real time support from the organization as well as retroactive chart reviews to advocate for improvement for outcomes being measured.

In the Dark

The focus group participants from the in-patient units expressed concerns that they are not able to clearly and consistently identify where the patient is in relation to the septic bundle. The focus group participants identified a number of issues that rose to the surface of the when discussing this issue. The focus group participants identified the lack of a standardized tool to clearly identify the next steps that are required to be implemented with regards to the bundle when a patient is admitted to the unit from the ED.

Other discussions identified the handoff process that is cumbersome and ineffective. There are no standardized tools related to handoff of the septic patient within the organization as described by the focus group participants. During discussions, it was noted there is a lack of standardized handoff when a patient is being admitted from the ED to an inpatient unit. Focus group participants described the lack of critical information regarding the patient's current condition and treatment that was completed prior to the transfer. The septic bundle is a tightly controlled, timed intervention that has a specific sequence to maximize optimal patient outcomes. This may be in part due to the

change of shift nurse who has not cared for the patient prior to transfer but is attempting to give handoff report with limited information.

One nurse commented:

> I don't think we can follow the bundle because can't nobody tell you what they did. They don't pull a lactic acid and they can't tell you how much fluid they've gotten. They just say normal saline has been going since 2 o'clock. They don't tell you they have gotten 500 mls or how much of the bolus bundle they have received. Half the time they do not know if the blood cultures have been drawn.

The focus group participants from admitting units understood that capacity management and patient care were issues within the ED. One focus group was frustrated with the current state of affairs with the electronic health record that did not provide easy access to information that would outline where care ended within the bundle with the ED and where the bundle should begin once the septic patient is admitted to the in-patient unit. One focus group member described their recent experience with an ED handoff:

> The worst thing I think that started to happen is when nurses start getting report from other nurses who have never seen the patient. In my mind I would rather just read the chart when you say I'm giving report for Susie Q. I don't know anything about the patient… STOP right there.

> It should be emphasized what has been done and what do I need to do. If you're getting this sick person you need to know what's the next step to take. That needs to be communicated when you get that handoff. If this is not done, the patient suffers.

For the nurses reporting this there was an underlying concern for the safety of the patient and the inability for the care nurse to continue the treatment and/or bundle once

the septic patient was admitted to the floor. The focus group participants expressed concern that they could not maintain a high level of care and nursing standards surrounding continuation of the bundle. The lack of information regarding next steps for the septic patient on a bundle created suboptimal care.

The nurses in the focus group provided some initial recommendations to include a specific handoff sheet for septic patients that was standardized and provided information regarding what medication and/or treatments was provided in the ED and which medication and/or treatments needed to be continued once the patient was admitted to the nursing unit.

Lack of Partnership/Respect

There were significant interactions and robust conversations when the question was posed related to barriers that may prevent RNs from implementing nursing surveillance. The group was quick to point out that physicians posed many barriers to the nurses on the units. The focus group participants used descriptive terminology when speaking of interactions between the nurse and physician. Words such as giving attitude, hateful, frustrated and back against the wall were used to describe physician interactions. The focus group participants relayed that the physicians treated staff like idiots, the physician had snapped at the nurse and the "doctor had shut her down."

Discussions also included how these physician interactions had impacted the nursing teams. Nurses described how these interactions were negatively impacting the nurses' confidence and competence. These actions were creating a hostile work environment that left the nurses feeling intimidated.

Here are some of the comments noted from the focus groups:

> I am confident. I know I am competent but if you start making me feel incompetent, I'm going to stop reporting findings to you.

> They (physicians) can still shut you down. They can still give you that attitude. They can give you that I'm too busy or I have to finish rounding on my patients. You still get that but there are some you can't even walk by in the hallway and they give you that look like Don't even speak to me and you don't even have a question for them, they'll just look at you.

The non-verbal cues were discussed as well as the behaviors that may prevent nurses from reaching out to the physicians. In a number of instances, the focus group participants described how through the behaviors and interactions with the physicians, there is a potential delay in providing the patient with the care they need. For the focus group, the emphasis was clearly on the needs of the patients. Here are several comments noted from the focus group members.

> When they (the physicians) are hateful towards you, you don't even want to call them. You don't want to deal with them, so I think that makes you wait longer to call them (the physician) which delays patient care. Your patient could get worse because you are intimidated by this person.

> It sounds like in a way that a lot of these interactions go against the iCARE values in a way and I wonder what the barriers are on the physician side because I don't think anyone is a bad person. I think accountability is the barrier.

Access to physicians was also outlined as a barrier to implementing the safety bundle. The focus group described the difficulty in reaching the physicians for care

orders or relaying information. The focus group participants felt a great deal of frustration with the lack of timely response to the request by the nurse. Nurses consider themselves as partners in the delivery of healthcare and for the physicians to not respond to requests by the nurse was inappropriate and nonprofessional behavior. The focus group participants described that there was no particular time of day that was better to receive a call back from a physician. The focus group participants felt the issue occurred any time of the day. This was particularly difficult when the patient was not doing well, and the nurses were stressed out trying to meet the patients' needs. Here are several comments relayed by the focus groups:

> It just depends on the physician. Our physicians last night took us forever to get in contact with them, so we had to page multiple times.

> I think after 3 o'clock it's harder to get a hold of the physician. Like in the morning time when they're around and they're still here it's easier to get a hold of them but as soon as they're no longer here it takes forever to get a hold of them.

> They (physicians) call me and I ask where they're at and they're like in my car. It took him forever to get him to call me in the morning.

Several of the focus groups indicated that they did not feel respected by some of the physicians. Described were feelings of distrust and frustration with the level of care that was being provided. Also described was a lack of presence by the physician when it was felt that the patient would benefit from the physician seeing the patient. One of the

focus group participants called out that she even felt stupid. Several noted comments included the following:

> It makes me feel frustrated and I feel like the patient is not getting adequate care especially when a lot of them have families in the room and they're looking at me like what is going on. It's very frustrating and it makes you feel kind of stupid.

> I feel like usually if my back is against the wall and I feel like I can't get a physician I will do a rapid or I'll do a code because I am at my wits end. My patient is tanking and there is nothing I can do but hit the code button and maybe someone will then come.

The focus group participants discuss the use of the rapid response team and the code blue team if they could not reach the physician. The group agreed that this may not be the best use of resources but was the last alternative that was available. Using these resources would at least guarantee the assistance and support that was required to ensure the patient was safe.

Knowledge Deficit

During discussions with the focus group participants there emerged a generalized theme of knowledge deficit. This deficit was notable in relation to two items, the sepsis bundle and nursing surveillance.

Sepsis Bundle

Given the complexity of sepsis and the urgency in which treatment should be initiated to promote the best outcomes, providers and nurses should be aware of the treatment modalities of sepsis. Within the discussions of the focus group participants,

only one person of the 28 interviewed could articulate the majority of recommendations for the sepsis bundle. Most of the focus group participants could describe the main components of SIRS criteria as well as some of the early warning systems used in the facility.

The components of the SIRS criteria that were described by the groups included elevated white count (indicating a source of infection), elevated heart rate, fever, blood cultures and fluids. Most of the discussion centered around the physician responsibility of initiating a code sepsis, where the order sets would be generated to begin the process of the bundle. The group participants were able to describe many of the independent processes that may be incorporated in the bundle (drawing labs, starting IV fluids and/or antibiotics), yet the initiation of the sepsis bundle was described as the exclusive prevue of the physician. There was no discussion among the focus group participants that recommended nursing staff take a larger role in initiating the bundle or how a nursing presence may provide opportunities in advancing care related to the septic bundle.

The focus groups were very forthcoming regarding their lack of knowledge regarding the sepsis bundle. Some of these discussion by the focus groups included the following:

> I'm going to be truthful; I don't know a whole lot about the bundle. A lot of times it's initiated downstairs, so I don't even know everything that's included with it. I know they're (the patients) are supposed to get antibiotics, they supposed to get fluid boluses. I know we're supposed to check their lactic acid. I don't know if that's two times or three times or whatever because a lot of that is started in the ED before we get them.

I have never initiated it so I'd be lost if you asked me to.

Several of the focus group participants were able to articulate a resource that had been provided to them related specially to the sepsis bundle. The badge buddy was a resource that most of the focus groups had attached to their ID badges. The badge buddy provided information regarding fluids, maintaining blood pressure, labs, medication and antibiotics.

Part of the discussion focused on calling a code sepsis on an in-patient unit. Prior to this, all discussion was focused on outpatient admissions from the ED. One of the participants had this to say regarding the inpatient initiation of a code sepsis bundle.

> I've never initiated a bundle. So, there is an inpatient bundle? I know I've read it. There is an inpatient bundle where if you have an inpatient that is septic within a certain number of hours you have to do this, in a certain number of hours you have to do this. I don't know the specifics of the hours and stuff, but I know you have to draw labs, and the amount of fluid you know per body weight and things like that.

There were detailed discussions regarding the role of the physician in initiating a sepsis bundle for an in-patient. The discussion focused on the orders that are placed by the physician that are separate and apart from the sepsis bundle. When the focus of the discussion was on the in-patient, many of the focus group members drifted back to the role of the sepsis bundle being an exclusive function of the ED and/or the role of the physician. There was little discussion regarding the nurse's role in understanding or suggesting the sepsis bundle.

Discussion from the focus group participants also centered on the perceived lack of understanding of the use of the bundle by the physicians who admit patients to the inpatient units. In many of the discussions, there was a thread that indicated the nursing staff did not have a great deal of confidence in the physician's understanding to appropriately implement the sepsis bundle. Here are several of the comments:

> What's crazy is that if we have a patient on the floor that turns septic, we don't have the providers that say hey, initiate a bundle. I'll be like what are we doing?

> There's a sepsis like order set that has the bundle in it. Nobody ever uses it, like not even the physicians when they're putting in their initial you know whatever, nobody every uses it.

> We are told they are aware of it and then I have encountered doctors that don't either know how to use it, don't know about it, various things so not just with that but like a lot of things but that goes into the order sets period for the computer.

Nursing Surveillance

Part of the discussion with the focus group participants centered around nursing surveillance. Nurse surveillance has been described as "the purposeful and ongoing acquisition, interpretation and synthesis of patient data for clinical decision making" (Brier et al, 2014, p. 883). During the focus group discussions, many of the participants were able to describe the process of nurse monitoring which is the use of data collection tools and is a function of the assessment process of nursing (Henneman, Gawlinski & Giuliano, 2012). Monitoring includes the process of observation, reviewing and

interpreting physiological data that is obtained by vital signs, lab values and other parameters reported through the use of hardware and software.

During the discussions with the focus group, responses to the question to describe nursing surveillance resulted in descriptions of nurse monitoring and not nursing surveillance. It is important to note that nursing surveillance is not the same as nurse monitoring. Nurse monitoring is the use of data collection tools and is a function of the assessment process of nursing (Henneman, Gawlinski & Giuliano, 2012).

Nurse surveillance is much more detailed and complex than nurse monitoring. The goal of nursing surveillance is to detect subtle changes in the patient condition and to intervene using appropriate resources and tools to avoid a poor outcome. In 2011, Kelly and Vincent identified nursing surveillance that focuses on the individual with a separate framework for care that is specific to meet the individual's needs with specific interventions. The framework for care and interventions results from the cognitive and interpretive actions of the nurse. Nursing surveillance is intended to identify at risk patients, implement appropriate treatments and mitigate the risk of death to these patients (Henneman et al., 2012).

When asked to describe the process of nursing surveillance, the following responses were provided:

> I'm going to keep looking at vital signs, are they running a fever, tachycardic or do they have any mental status changes
>
> Isn't that watching the numbers?

Assess the complaint. Does the complaint lineup with the symptoms?

Many of the focus group participants had difficulty describing the process of nursing surveillance and used descriptive phrases or words to describe nursing surveillance. These included such things as “keeping an eye on your patient”, “monitoring vital signs” and “staph infections”.

The focus group participants described the differing level of care speaking to ICU level of care versus non-ICU level of care. The focus group participants commented on the more focused level of nursing surveillance in the ICU compared to a non-ICU level of care. According to the focus group, the ICU patient would require a higher level of nursing surveillance than a non-ICU patient. In fact, the ICU patient would require a higher level of nurse monitoring rather than nursing surveillance. In one focus group nursing surveillance was described as the following:

> If care needs to be escalated or de-escalated or you know we process data like the trends of vital signs, lab work, is the patient awake and oriented and all of those things we are constantly doing.

The inability of the focus group participants to describe the processes and actions of nursing surveillance is a significant finding. It should be expected that participants of the focus would be at varying levels of development according to Benner’s model. Since there was a wide range of nursing years of experience among the focus group participants several would be expected to range to Benner’s expert level.

Each participant from the focus groups were unable to categorically describe or define nursing surveillance as a process or tool to use to evaluate a patient despite their admitting diagnosis. No member of the focus group relayed to the investigator the need to provide findings to the provider, who would in turn provide orders for the nurse to institute and evaluate the impact of the treatment ordered by the provider. The PI provided information describing the role and focus of nursing surveillance. Even after the description, the participants of the focus groups appeared confused about nursing surveillance.

Nursing surveillance is a bi-directional modality which is one the most important aspect of nursing surveillance. Given the potential for subtle changes in the patient condition for someone diagnosed with sepsis prior to a multi-organ failure event, it would be important for the nurse to clearly understand their role and function related to nursing surveillance.

Data Saturation

The qualitative gold standard for quality research is data saturation (Hancock, Amankwaa, Revell & Muller, 2016). Thematic saturation occurs when there are no longer any new or emerging ideas that come from the participants in original or follow up conversations. Although the results of a qualitative study cannot be generalizable, the findings should be transferable. The researcher presents findings in such a manner that permits transferability. That is the reader of the researcher has sufficient knowledge that he/she may be able to transfer the information (Amankwaa, Revell & Muller, 2016).

Fusch and Ness describe the use of focus groups as a method of data collection that is unstructured dialogue between group members and a facilitator. Topics discussed in focus groups and questions used provide the opportunity for multiple perspectives to be shared. This method promotes openness which allows for multiple views of the meaning of truth (Fusch & Ness, 2015).

The researcher is often faced with the question of how many participants and focus groups to have for their study. According to Krueger and Casey (2015), researchers should plan for three to four focus groups for each type of category being studied. Each focus group should consist of 6 to 12 participants to assure a large enough number for rich dialogue yet small enough for every voice to be heard. The goal will be to reach data saturation.

Saturation is described as the point where you have heard the range of ideas and are not getting any new information from the group or participants (Krueger & Casey, 2015). The intent is not to look at each participant within the focus group but rather the goal is to analyze the information obtained among groups looking for patterns or themes. It is anticipated that 4 to 6 focus groups will be needed for this study.

At the end of each focus group session, information was drawn out to highlight areas of concern or expressed interest were tagged. By focus group 3, the PI and associate moderator noted a pattern beginning to form. Concerns expressed regarding staffing, physician relationships and the lack of a consistent handoff from the Emergency Department were developing. As the research moved forward it was noted that groups 4,5 and 6 all had common threads related to issues. It was determined that saturation had

been obtained by group 6. At that point is was determined no additional focus groups were required.

Two additional areas of concern were also identified. These included a knowledge deficit regarding the sepsis bundle and nursing surveillance. There were also small pockets of additional, unit specific issues that were interesting but not included in the study.

Summary Chapter IV

The purpose of this study was to explore the nurses' understanding of nursing surveillance with a secondary aim of describing barriers to successfully implementing a comprehensive nursing surveillance plan. This was a qualitative study involving 28 registered nurses placed in six focus groups who worked in various units in a community hospital in the Southeast. Five major themes were identified and presented above. The nurses described mixed emotions and the lack of resources that included physical resources including staffing, tools that enhance and streamline communication with colleagues, and information and training to enhance the awareness and needs of the septic patient. The nurses also described a disconnect when receiving information form the ED in relation to what is required to continue the sepsis bundle once the patient arrives to the in-patient unit. The in-patient nurses did not feel that there was a good system to provide information and a much more labor-intensive method of data collection was the chart review. Given the urgency of care, this was felt to be a less than optimal resource.

It became clear that during the focus group discussions, the nurses were unaware of the concept of nursing surveillance in its entirety, nor could they articulate all of the

components of the septic bundle. Information regarding nursing surveillance and the components of the bundle is an important aspect to address as these components address the care and outcomes of the septic bundle.

Discussions also included discourse between nursing staff and the medical staff. It is important to note that this discourse was not reflective of all physicians, however there was a high level of discourse noted between nursing staff and medical staff, especially those who care for patients with a diagnosis of sepsis.

CHAPTER V

DISCUSSION AND CONCLUSION

The purpose of this study was to explore nurses' knowledge of nursing surveillance of the septic patient. A secondary aim was to describe any barriers to successfully implementing a comprehensive nursing surveillance plan. Research related to septic patients and outcomes has determined that identification of risk of sepsis and urgent treatment are required to promote wellness and save the patient from death. The multiorgan system failure may occur in a matter of hours placing the patient at subsequent risk of mortality or significant injury.

Nursing surveillance is key to the success of the sepsis bundle and care of the septic patient. If nurses and providers do not understand the concept of nursing surveillance, then they are not able to implement nursing surveillance to its full capacity. Nursing surveillance includes robust monitoring of the patient, keeping a keen eye on subtle changes that may indicate a brewing problem as well as the need to partner with providers. This partnership provides the opportunity to implement appropriate treatments and standards of care in an expedited manner to ensure safety of the sepsis patient. Time is of the essence to great patient outcomes, particularly with sepsis patients.

The study was a qualitative study using focus groups. The five themes which emerged from data analysis included mixed emotions, lack of resources, in the dark, lack of professional partnership/respect and knowledge deficit. This chapter provides

a discussion of the results of the focus group data related to the findings and recommendations for education, nursing practice and research.

Mixed Emotions

The focus group participants discussed the fear and frustration caring for the septic patient. The emotion of fear, with the associated perceived burden of being very time consuming, may be a product of the lack of knowledge regarding the processes of implementing the bundle and the resources required to accomplish timed goals. The combination of lack of knowledge, perceived burden of care and the staff to patient ratios are seen by the focus groups as impediments that do not permit the nurses to provide the level of care that is required.

The study found that the nurses did not feel confident that they could adequately care for the patients in the current environment. There was the feeling from many of the focus group participants that there were obstacles that prevented a level of care that the nurses hoped for. The nurses described the lack of appropriate information from the admitting unit, the sheer volume of work that is required to meet reportable outcomes, high census and acuity of patients all create a superstorm that does not have the patient's best interest at hand.

This burden was not unique to the inpatient units. The high volume of septic patients presenting to the hospital emergency department also created feelings of being overwhelmed, rushed and pressured to meet specific goals and timeframes.

A review of the literature produced no specific research related to fear and frustration for the non-ICU nurse caring for an adult septic patient on the general medical

or surgical unit. An older study described the experiences of caring for a critically ill patient within a general ward setting. In this study participants described a sense of feeling a heightened panic and being nervous related to those patients who had become unwell. These emotions were described as negative emotions where on occasion the participants felt they had lost control (Cox, James & Hunt, 2006).

A different study by Vermier et al, completed in 2017, noted that job dissatisfaction is associated with burnout, particularly with healthcare staff. Although not specific to caring for the septic patients, frustration is an important topic to consider. In the study, burnout is defined as a state of fatigue or frustration brought about by devotion to a cause, way of life or relationship that failed to bring the anticipated response. High rates of frustration and burnout were also connected with high rates or staff turnover and intent to leave. Given the risk of high turnover and the potential for nurse staffing challenges, frustration for nurses working at the bedside and the association with burnout and turnover, this will be an important area to explore and address.

Practice Implications

Nursing in a complex health care environment provides daily challenges to the nurse. These challenges are often beyond the control of the nurse. If a nurse in working in an environment that is fueled by fear and frustration both the nurse and patient have the potential to suffer. Noted by Cox and Venier in previous studies nurse dissatisfaction and burnout may occur. These may lead to errors related to care and increased negative outcomes for the patient.

Providing tools and support from a local and system wide perspective will be required to ensure the nurse is successful. Adequate staffing and education, peer and management support from the unit and executive level are required to ensure a healthy and stable workforce.

System Wide

The practice implications from a system wide perspective are similar to those at the unit level. The system wide approach requires the adoption of evidence based tools and approaches that will support the nurse in providing care. Through standardized education, support and mentoring, the nurse will feel supported to work in an environment that provides, at times, unexpected patient care challenges that may be handled appropriately without additional stress to the nurse.

Unit Level

The environment that values nurses, provides work that is meaningful and within the scope of practice may produce a workforce that is satisfied and willing to maintain employment. Decreasing the rate of turnover is essential for a sustainable workforce that can produce safe nursing care with associated improved patient outcomes. Collective support at the unit level provides an environment that is a safe have for nurses to share experiences and support one another.

QHOM Application

The application of the QHOM in this theme demonstrates how the construct of a feedback loop can be interrupted. Participants indicated they had little of no confidence in

caring for a septic patient. The participants indicated that there were obstacles and felt the process was a burden in their attempt to deliver care.

In this example we can see how the connection is broken. When the nurse is at odds with their ability to care for a patient, or there is a concern of obstacles impeding the ability to deliver care the process of the feedback loop in the QHOM stops. It is difficult to predict when the loop is reconnected or if the connection is a weak one that may impact care and outcomes of the patient.

Lack of Resources

The focus group participants were clear that they felt that the addition of a septic patient to a regular assignment of five to six patients was difficult to manage. The focus group participants described that the intensity of labor required to meet the needs of the septic patient early on in the admission process was particularly burdensome.

The participants also described the reality of having a septic patient as part of a large assignment would lead to other patients suffering from a lack of care that the nurse hoped to provide. There was also concern expressed of the additional burden of having a "sick" patient already in a patient assignment and the conflict that arose when the addition of a septic patient increased the burden.

The SSC has been providing care guidelines since 1997 in an effort to improve care and outcomes for patients with sepsis. During a phase III session, the researchers of the SSC began working on a quality improvement (QI) program that would focus on non ICU patients. The purpose of the QI program was to focus on early recognition of sepsis

symptoms for non-ICU patients following a protocol that was nurse driven for screening purposes (Schorr et al, 2016).

The QI program focused on the attributes of the 3-hour bundle that had been developed by the SSC. The program used the IHI's Plan-Do-Study-Act (PDSA) model. A large cohort participated in the pilot study including 60 academic and community hospitals in a number of regions in the US. Screening tools were implemented and evaluated with changes being made with feedback from the participants (Schoor et al, 2016).

Despite the gains related to patient outcomes for the ICU patients, the QI program did not provide any improvement for non-ICU in-patient units. The variable workflow for non-ICU in-patient units were described as challenging. The patient ratios tended to be large on general units. Often, there are high turnover rates related to patient transfers, admissions and discharges. The broad work that needs to be completed by nursing caring for patients on the general in-patient care units may take several hours to complete. Mortality remains high on the general in-patient units with a reported mortality rate of 44.3%. These high mortality rates may be due to the delay in recognizing the signs and symptoms of severe sepsis, delay in treatment or a delay in proper diagnosis (Schoor et al., 2016).

There is a large body of research that discusses nurse to patient ratios. The negative impact to care and outcomes have been well documented (Aiken, 2019, Choi, 2018, Driscoll et al, 2018, Fotsch, 2019, Hill, 2017, Shang, Needleman, Liu, Larson,

Stone, 2019). This study supports other studies related to the concern of staff related to workload and staffing resources.

Charge Nurse

It was interesting to note that the lack of resources was not only focused on the direct care nurse. The charge nurses in the focus groups also expressed concern and frustration when they, as the charge nurse, were responsible to care for a patient assignment as well as responsible for the unit and act as a resource for the other nurses. The charge nurses expressed feelings of being frustrated with not being able to help teammates. They were also concerned with feeling inadequate with their ability to provide a high level of care and customer service.

There is a large resource of literature involving the charge nurse (Al-Majid, Carlson, Klyohara, Faith & Rakovski, 2018; Agnew & Flin, 2014; Carlin & Duffy, 2013; Rankin, McGuire, Matthews, Russell & Roy, 2015; Sherman, Schwarzkoph & Kiger, 2011). These bodies of research speak to several key areas involving the charge nurse (CN). The role of the CN has expanded over the past two decades (Carlin &Duffy, 2013). Prior research suggests that the role is more of an administrative role compared to a clinical role. The responsibilities include but are not limited to unit oversight, management of resources, policy interpretation, patient satisfaction and communication with physicians.

There were no research studies that identified the feelings of inadequacy by the CN with the current expected role to assist the staff with their needs, while caring for their own patient assignments. These feelings and perceptions of the CN as noted in this

study may be a precursor to increased frustration and lack of fulfillment which may lead to higher rates of burnout and flight risk from the unit and/or the organization. This unique finding may benefit from further research.

Practice Implications

Adequate resources are necessary to have a stable and sustainable workforce to continue the delivery of healthcare. Inadequate resources may lead to medical errors, lack of adherence to policies and procedures, shortcuts with the delivery of care and the inability to provide nursing surveillance at the level that is required (Aiken et al, 2018).

Organizations will be required to review the current state of resources related to patient outcomes and impact to the organization's bottom line to find balance for care and sustainability. The role of the charge nurse may be required to be reexamined given the increased administrative responsibilities associated with the role. Lack of resources may lead to increased mortality and/or poor patient outcomes. This may lead to increased patient suffering, increased length of stay, high nurse turnover and substantial impact to the financial forecasts.

System Wide

Executive leadership at the system level has a number of competing priorities. Adequate team members to support the organizations mission and goals is a top priority for leadership. The work of health care services is people driven that gives way to variances in outcomes and cost. The priority for health care systems is to provide adequate, ongoing and sustainable resources to stabilize the workforce and meet metrics of the organization and regulatory bodies.

With increased resources comes increased costs. The role of value added driven care provides a road map for organizations to adjust resources as needed while providing and efficient and cost appropriate impact. The implications for not providing adequate resources may lead to high turnover, high incurred costs, poor patient outcomes and the inability to meet regulatory guidelines with assessed costs for not doing so.

The implications for the unit level are similar to those at the system wide level. Difficulty in recruiting and/or maintaining adequate staff creates the potential for errors, lack of care, poor patient experiences and a negative impact on nurse sensitive indicators. Nursing units have the unique opportunity to become creative with staffing models, utilization of resources and care models with input from the front line staff.

QHOM Application

Regarding lack of resources, the QHOM may be fractured, disconnected or never begin as a feedback loop if the nurses are unable to provide a level of care given the demands placed upon them with a lack of resources.

The feedback loop is continuous and includes data received from a number of resources. The participants described the inability to perform required tasks or meet expectations related to patient care given the lack of resources. It is concerning that given the lack of resources as described and the inability to complete all of the needed tasks and/or evaluations that the level of care may be compromised. The intent of the QHOM and nursing surveillance is to have at a moment's notice information that is needed for partner providers to plan appropriately.

In the Dark

Nurses from all inpatient units had very similar views related to the difficulty of handoff when admitting the septic patient. Patients who are septic are admitted to the nursing inpatient units are most likely to be admitted from the ED. The nurses in the inpatient units expressed frustration with the report they receive from the ED transport nurse on arrival to the nursing unit. The receiving nurses expressed concern that there is no consistent format to the handoff for the septic patient who is being admitted. There is a perceived disconnect between the information that is received by the admission nurse of the in-patient unit and the information provided by the ED nursing team. The focus group participants indicated that there is a lack of information being provided when a septic patient is being admitted.

The nurses from the inpatient units discussed wasted time and resources. It was discussed that when the report from the ED nurse did not provide essential information that would allow the inpatient nurse to continue the sepsis bundle, it was necessary to stop what the admitting nurse was doing to find information in the chart. The in-patient units are under the same time sensitive markers for a code sepsis as is the ED. However, if the admitting unit is unaware of where to pick up care, then the inpatient unit feels they are behind from the start in the delivery in treatments.

This study confirms previous research that has been completed regarding the need for standardized handoff to maximize patient safety and minimize risk (Balhara et al., 2018; Ford & Heyman, 2017; Hale & Gaines, 2012; Mason, Derby, Wrobleski & Foss,

2012; Smith et al., 2017;Wentworth, Diggins, Bartle & Johnson 2017;White & Dearmon, 2018).

According to Balhara in 2017, patient handoffs occur when patient care responsibility is transferred from one clinical provider to another. The author describes how the lack of robust information in the handoff can have a negative impact on patient safety. The author of this study noted the miscommunication or lack of information is associated with adverse events and patient safety concerns. Recommendations from this study include standardized handoff practices to improve patient safety. It is important to note that this was a joint commission patient safety goal in 2006 (JCAHO, 2005).

In another study by Smith et al, in 2017, the safety gains from standardized handoffs was discussed. The researchers noted that handoffs are a particularly vulnerable time for patient safety. Medical errors and malpractice claims are often a result from poor communication within hospital systems. The transfer process from the ED to inpatient units is a complex one that has the patient faced with a physical location change, a change in medical and nursing providers with specific protocols and routines It was interesting to note that standard handoff communication tool have been shown to improve outcomes for inter-units handoffs but not widely used for admission handoffs (Smith et al, 2017).

Handoff at the bedside continues to gain traction for two reasons. The handoff provides a clear and standardized approach to providing important and significant details regarding the patient's current and future needs and allows the patient to participate in the handoff process.

Practice Implications

The need for standardized methods of clinical handoff has been clearly documented (JCAHO, 2005; Smith et al, 2017). Without adequate handoff, the flow of patient transfer is interrupted losing valuable care time interrupted by the need to review the chart, notes and any other information that is available. Adequate handoff provides the nurse with one of the tools to improve the timing of the treatment regime, improves care and enhances the overall patient experience.

System Wide

Implications for the system include standardization of policies, procedures and guidelines meeting the many complexities of the regulatory bodies that govern practice within our healthcare system. Standardization of policies provides a protective measure when addressing care at the unit level and maintain outcomes as they align with the mission and vision of the organization. Financial rewards and penalties are often part of the regulatory framework which provides an additional incentive to work in a standardized fashion. More importantly however, is the need to ensure safety and high standards of care for improved patient outcomes. Unit Level

As described in this study, standardized handoff is necessary to have a fluid transition for the patient who is moving from an ED to an inpatient admitting department. To ensure consistency with the sepsis bundle and to understand where care ended in the ED and should begin on the inpatient units is necessary for transition of care.

QHOM Application

As in the lack of resources, the theme of in the dark presents the unusual challenge of not being able to begin the process of data collection, evaluation of findings from the patient and the environment. Within this theme, there is a delay in receiving information, which in turn delays assessment of information and a delay in receiving provider recommendations. This is not to suggest that the QHOM does not begin with this theme, however it does speak to a delay. Given the impact of delayed treatment for the septic patient this may raise concerns.

Lack of Partnership/Respect

The theme of lack of partnership/respect created some lively discussion among the groups. Physicians were listed by nurses as a significant barrier in terms of timeliness and accessibility to meet the needs of the patients. The nurses are confident in their roles and abilities. Yet, when physician behaviors and interactions with staff create a difficult work environment the nurses are less likely to interact with the physicians.

Nurses in the focus groups described physicians as shutting them down, are hateful towards nurses, and that the physicians had a lack of accountability. Specific time periods made it more difficult to connect with the physicians (i.e., after 3 pm) and that there was a lack of respect and trust from the physicians directed towards the nurses. The focus group participants described a lack of professional courtesy shown towards the nursing staff. It is important to note that not all physicians were labelled as lacking respect. These physicians however were in the minority during the focus group participant discussions.

Nurse physician conflict and adverse relationships is not a new phenomenon. As early as the 1980's research was being conducted focused on nurse and physician relationships. In their study in 1988, Katzman and Roberts noted that interprofessional conflicts has been a part of nursing since Florence Nightingale. The impact of gender in the 1980's played a factor as a barrier to the professional roles of the nurse. During the 1980s 96% of the nursing workforce was female, where 88% of physicians were male. The research also noted that the sociocultural perception of the role of women in society acted as barriers for the state of nursing and women's movement in general. The new roles that were aspiring to in the 1980's were impeded by the imbalance between physician dominance and nurse subservience. Is this potentially part of the issue that nurses from the focus groups are dealing with 30 years later?

In the 1990's, research was continuing regarding the roles and conflicts among nurses and physicians. In 1991, McLure recognized that tension between nurses and physicians may be a byproduct of the roles of the nurse. McLure notes that one of the most important roles of the nurse was to provide care to patients to monitor their conditions. When the patient has a deviation from the normal course of progress the nurse is expected to take the steps to correct the problem.

The nurse has within their scope of practice the ability to provide care in an independent fashion. However, when the patient needs exceed the nurses scope, the physician must be involved. This may require interruption of the physician's sleep, home activities and interruption in the physician's work. These factors may lead to friction with

the nurse to physician relationship (McLure, 1991). Findings from this study clearly identify the need for more efforts to improve the nurse and physician relationship.

Practice Implications

Patient care does not occur in a vacuum and requires the resources of nurses, physicians and ancillary services. There has been a great deal of research related to working relationships of the nurses and providers dating back as far as the 1980's. The implications of poor communication and/or lack of respect were evident in this study. Nurses who do not feel partnered with their provider counterparts will seek alternatives to care. This may lead to a disruption in care and patient outcomes.

System Wide

Developing appropriate work relationships is especially important between nurses and providers given their intimate care and knowledge of the patient. When relationships are broken, and trust is not established the risk of communication breakdown and errors unfolding is high. Nursing engagement and provider satisfaction is a key indicator of how well the organization is doing in this matter.

QHOM Application

In any care setting, nurses and providers depend on each other to share information, outcomes and plans of care that may require modification if goals are not met. In the situation of lack of partnership and respect the QHOM is once again fractured or delayed.

Participants in this study indicated that the lack of a positive working relationships with the physicians create diminished communication or a lack of

communication all together. The QHOM cycle does not begin or is compromised which impacts patient care.

Knowledge Deficit

Septic Bundle

It was clear during the study that the focus group participants had little or incomplete understanding of the septic bundle. The focus group participants were open and transparent regarding their lack of knowledge regarding the septic bundle. The focus group participants indicated that they did not know the components of the bundle, nor had many of them ever instituted the bundle for a septic patient.

The clear majority of the focus group participants indicated that the physician was responsible for initiating the bundle and not nursing. The lack of knowledge for implementation of the bundle may cause delay of treatment for the patient. Rapid intervention is required to have the greatest benefit to positive patient outcomes. Each hour of delay in administration of appropriate antimicrobial increases mortality, kidney, lung and organ injury (Delliinger et. al, 2017).

Many of the participants in the focus groups were able to discuss components of the sepsis bundle (especially fluid) with some disagreement around the standard volume infusion. In addition, the focus groups were able to discuss some of the SIRS criterial that may prompt the initiation of the sepsis bundle. The focus groups did refer to the badge buddy that provided information on sepsis and the bundle. Most of the focus groups forgot that the information was available on the badge buddy.

There are several recommended strategies to combat knowledge deficit related to the initiation of the sepsis bundle. Two of these strategies include competency based education and training and simulation.

Competency based education has had a long tradition of training nurses in hospital settings. This type of education provides the nurse the opportunity to demonstrate knowledge and outcomes (Gravina, 2017). This model would provide the nurse the opportunity to demonstrate knowledge related to the components of the bundle and the application of the components of the bundle during the prescribed times. This type of education and evaluation of the nurses' level of knowledge may have better validity than other types of evaluation. This measurement of skills takes into account the ability to integrate knowledge and skills into practice (Fordham, 2005; Gravina, 2017).

Another strategy includes enhancing critical thinking with the use of simulation. Critical thinking in nursing has been described as a process of reflective and reasonable thinking. Nurses may address problems that do not have a single solution. Rather nurses focus on deciding what to believe and do (Adib-Hajbaghery & Sharifi, 2016).

The use of experiential learning methods includes simulation that allows the nurse to learn complex processes related to care in a safe environment that does not pose risks to patients or the nurse. Using simulation with a human like mannequin is a good strategy to promote clinical thinking and decision making. Simulation based education is interactive and a practical means to provide standardized clinical scenarios for educational purposes (Kim, Noh & Im, 2017).

This is the first known study that looked at the lack of knowledge by the nurse regarding the sepsis bundle. Given the previously discussed need for timely intervention of the sepsis bundle, this would be an important topic for further study if sepsis patients will continue to be admitted to the non-ICU units.

Nursing Surveillance

A great deal of discussion surrounded the concept of nursing surveillance. Many of the focus group participants were able to discuss many components of nurse monitoring but not nursing surveillance as a concept. Much of the discussion centered around the tasks related to care, vital signs and lab values, much of which is described as nurse monitoring and not surveillance. Nurse surveillance is much more detailed and complex than nurse monitoring. The goal of nursing surveillance is to detect subtle changes in the patient condition and to intervene using appropriate resources and tools to avoid a poor outcome (Hennman et at., 2012).

The role of the nurse is to keep the patient safe. This is done through nursing surveillance. The act of nursing surveillance involves interpretation of data from a number of sources that allows the nurse to see the patient as a whole. The use of monitoring devices, observations and information obtained from the patient and family are key to providing adequate information to appropriately care for the patient. It is the swift identification of changes in the patient condition early with swift and appropriate interventions that provides for the best outcomes (Brier et al., 2014; Henneman et al, 2012; Voepel-Lewis, 2012). Clearly understanding the role and importance of nursing

surveillance related to the septic patient provides for the greatest chances of successful outcomes.

Practice Implications

The practice applications for both system and unit are the same. The level of knowledge deficit in the understanding of nursing surveillance and the septic bundle implies that the accepting nursing on the in-patient units do not have the tools or knowledge to intervene in time sensitive care. Although nursing surveillance is not specific to care of the sepsis patient, vigilance through nursing surveillance provides the necessary structure to evaluate and implement treatment in a timely manner.

Educational development plans may provide the framework for a greater understanding of both nursing surveillance and use of the sepsis bundle. The educational sessions may assist with earlier intervention of appropriate care for the septic patient. The impact may provide the nurse a sense of validation given the use of knowledge and tools to positively impact patient outcomes. The return on investment (ROI) for the system may include a decrease in mortality rates, improved outcomes with patient outside of the sepsis realm and enhancing the voice for nursing. The opportunities to have a positive impact on the patient population may be very large given the increasing population suffering from sepsis.

Recommendations

Communication of the results of these findings should be the priority. Sharing the information to key stakeholders at the system, organization and unit level provides the opportunity to unveil the issues that arose during this study.

There are several opportunities noted within the study which may require support from several different areas. These include nursing and nursing resources, staff education, physician relations and operational effectiveness. The findings of this study have implications for nursing practice and the opportunity to build or rebuild relationships with the medical staff.

The second step is to develop education specific to nursing that deals with the introduction of the sepsis bundle for a patient that is admitted from the ED. The development of an educational program should focus on the expectations of sepsis bundle. Content of the bundle, the order in which the bundle should be implemented, urgent timelines and specific expectations of the nurses and providers must be included. This information will provide an opportunity for providers of care to have a better understanding of the logical sequences of treatment. As a nurse sensitive indicatory this evidence based practice rationale should be part of the training to provide a clear understanding of nurse expectations.

In addition, a Mock Code Sepsis may also be a useful tool for the nurses to use to better understand the use of the sepsis bundle and the components involved. In a safe environment, the simulation coordinator has the option to demonstrate the mock code sepsis with the most serious outcomes with multiorgan failure and potentially death of the patient.

The third step provides an opportunity to review the current staffing and care model to validate that it is the most appropriate manner of delivering care for the nursing unit. Evaluation of specific unit needs and the willingness to be creative with a staffing

model may alleviate some of the issues and frustrations noted in this research. One recommendation is the consideration of the creation of a specific sepsis "admission squad" (SAS) on the unit. The intent of the SAS would allow subject matter experts (SME) to focus on the assessment, admission and intervention/implementation of the bundle to ensure timely and accurate care for the sepsis patient.

The SAS would provide consistent and focused care on admission to relieve other unit staff of this perceived burden. Once settled, the SAS could hand over the admission with follow up and just in time education or take on the patient care responsibilities themselves. Many organizations have supplemental resources that may play a role if the SAS is deemed inappropriate.

Rapid Response Teams (RRT) may be a resource currently within a system that may be utilized as a responder to calls for assistance with sepsis patients, admissions and assessment as well as intermittent team education as a SME. Additional resources may include per diem nurses or a specialized group of nurses that do not have a specified territory that they are assigned to. Rather these nurses act as resources on a "as need basis" to assist with the needs of nurses and units.

The fourth recommendation is related to the development of a handoff tool to be used by the ED when preparing to admit a patient from the ED to the inpatient unit. Development of the handoff tool should be a joint effort between the inpatient units and the ED to be certain that it meets the needs of the inpatient units and is deliverable by the ED. Consistency of use is key to the success of the tool. Leadership should check-in to be certain the expectations for use are being met.

The fifth recommendation is the opportunity to build positive relationships with the medical team and the nursing staff. The medical team leadership must be made aware of the findings of this study in the spirit of transparency. The results related to physician behaviors and interactions were clear and consistent throughout the study.

Relevance

This is the first known study that looks specifically at the nurses understanding of nursing surveillance and barriers that may inhibit nurses' ability to adequately implement surveillance. Throughout this qualitative study, nurses provided insight into the challenges of care specific to the septic patient.

The focus group participants provided rich and robust descriptions related to the sepsis bundle, barriers, and outcomes. The study brought to light unique findings including the impact of a lack of standardized handoff from the ED to the admitting inpatient unit (Levy, Evans & Rhodes, 2018). This is relevant given the potential devastation of sepsis and the need to implement care in a systematic and timely fashion to prevent the condition from moving to a multi organ failure state that has a high mortality rate (Dellinger, Schoor & Levy, 2017).

The focus group participants identified a knowledge deficit related to nursing surveillance and the sepsis bundle. Raising awareness of these two areas are important since these are key measures to improve care and outcome for the septic patient. In addition, the focus group participants identified the feelings of inadequacy and failure of the CN who has a full patient load while trying to complete the role and duties of the CN.

Recommendations for Future Research

This study has provided a foundation for future research that will inform the practice of nursing as it pertains specifically to the care of the septic patient. This study has uncovered some findings that are unique and not been studied before. This study provides a starting point to developing knowledge that can inform nursing education and practice.

This study noted a fear of caring for septic patients. The fear may be a result of lack of knowledge, feelings of being incompetent in the care of the septic patient, or a combination of both. In addition, CNs noted their feelings of frustration and inadequacy in supporting the staff with the role expectations of the CN while caring for a patient assignment as well as the added duties of CN. Research should be undertaken to dovetail with this research to have a better understanding of the impact of fear and frustration caring for the septic patient and the impact on patient outcomes.

Another finding from this study was the lack of knowledge regarding nursing surveillance. Nursing surveillance is a key component of nursing practice, and it is especially important caring for critically ill patients whose outcomes depend on timely and strategic treatments to improve patient outcomes (Henneman, 2012; Voepeo-Lewis et al, 2012). Further studies should be undertaken to follow up with this research to better understand the impact of knowledge deficits of nursing surveillance and the impact on outcomes of patients. This particular study could be expanded to other health systems with a movement towards a national view.

Nursing Education

The study provides some insight into knowledge deficit of key components to care not only related to the septic patient, but also all patients who are under the care of nurses. Nursing surveillance is a key component of the role of the nurse providing care to patients on a round the clock basis. Fully understanding the key components of nursing surveillance as well as the mechanics of implementing nursing surveillance has a direct impact to the care and outcomes of patients.

Nursing education provides didactic and practical experiences to enhance the nursing students' understanding and application of the concept of nursing surveillance. There are no known studies that provide insight into the application of nursing surveillance once the nurse graduates from nursing school. Although Benner's model suggests that the application of a complex phenomenon such as nursing surveillance would be best achieved by a more experienced nurse, the use of nursing surveillance may be considered a primary nursing tool that is used with entry to practice. Nursing educators may need to begin to look at the concept and the implications to practice as course curriculums are drafted.

Study Limitations

The author discussed recruitment of nurses to participate in the focus groups. Given the quick recruitment of the focus group members, other interested participants may not have joined in the study. However, there were no limitations placed on the number of participants and no responses to participate after the groups had completed. Another limitation is that the study is not generalizable.

QHOM

The use of the QHOM theory was an appropriate one. The QHOM is a bidirectional model that utilizes information from different sources and pursues the best outcomes in a loop type design. The QHOM stops progressing forward if there are barriers that does not permit a smooth transition to complete the loop. During this research, we can interpret how the QHOM informed the study.

Much like the QHOM, nursing surveillance is a bidirectional function of the nurse. Information flows from information systems, the patient and the environment to the nurse. The nurse then processes the information to make decisions related to the care of the patient. Once completed, the nurse returns to the patient to validate the information and informed decisions made by the nurse.

One the nurse identifies issues and requires additional interventions, the information is provided from the nurse to the provider. The provide evaluates the data provided by the nurse, makes informed decisions and relays that information back to the nurse. Once clarification of the interventions are completed the nurse provides the treatment to the patient. The cycle repeats itself in the manner of evaluating outcome of the treatment.

During the care of a patient, including the septic patient, if any direction of evaluation and/or care is halted or under performs and does not meet the expectation of the nurse the bi-directional loop cannot not be completed to its maximum potential. This is also true for the The interruptions will halt progress from moving forward for both the QHOM and care of the septic patient.

Qualitative studies using focus groups provides a unique perspective looking into the thoughts and emotions of the participants. Nursing is complex. Integration of science, research and the personal aspects of care and emotional connections provides nursing the opportunity to provide care from a holistic approach.

Summary Chapter V

The purpose of this study was to explore nurses' knowledge of nursing surveillance as it pertains to the septic patient. A secondary aim was to describe any barriers to successfully implementing a comprehensive nursing surveillance plan. The literature is clear in its assertion that nursing plays a vital role in the care and surveillance of the septic patient. Close monitoring and evaluation of subtle changes in physiological and neurological states is paramount to report to the provider the findings and to implement a treatment plan accordingly.

Nursing care does not occur in a vacuum. Patient throughput, information gathering, observations, surveillance and strong working partnerships with providers and other care team members is necessary to provide high quality care in an ever increasingly complex system that delivers healthcare. For conditions that require immediate interventions, systems must work in sync with each other to have the best possible outcomes.

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APPENDIX A

CONSENT TO ACT AS A HUMAN PARTICIPANT

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

CONSENT TO ACT AS A HUMAN PARTICIPANT: LONG FORM

Project Title: Nurses' knowledge regarding nursing surveillance specific to the septic patient

Project Director: Paul LeBlanc RN, PhD(c)

Faculty Advisor: Dr. Susan Letvak, Professor UNC Greensboro School of Nursing

Participant's Name: _____

What is the study about?

This is a research project. The purpose of the study is to explore nurses' knowledge of nursing surveillance and barriers to nursing surveillance related to the septic patient.

Why are you asking me?

The reason for selecting the participant; includes the following. The participant is a registered nurse with at least six months experience caring for a septic patient.

What will you ask me to do if I agree to be in the study?

The study is a qualitative study that utilizes focus groups to provide insight into the nurses' understanding and implementation of nursing surveillance. The maximum amount of time to participate in the study is 60-90 minutes. Participants in the study will be afforded the opportunity to share insights and feeling as it relates to the study topic.

The focus study is not expected to cause any stress or pain (physical, psychological or emotional). In the event that the participant feels any stress or pain, the participant is able to discontinue participation in the study without harm.

Participating in this study is completely voluntary and you may stop/walk out of the focus group interview at any time.

Is there any audio/video recording?

This study will use an audio recorder to capture the responses provided by the participants of the study. Because your voice will be potentially identifiable by anyone who hears the tape, your confidentiality for things you say on the tape cannot be guaranteed although the researcher will try to limit access to the tape as described below.

What are the dangers to me?

The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants. If you do get upset by anything discussed in this focus group, I will stop the interview and ask if you need a break or wish to leave. You can seek confidential counseling from Human Resources at Cone Health to discuss any negative feelings or emotions from discussions in your focus group as well.

If you have questions, want more information or have suggestions, please contact Paul LeBlanc who may be reached at 919-943-1440. You may contact the principal investigator by email at phleblan@uncg.edu.

You may also contact the faculty advisor Dr. Susan Letvak at UNC Greensboro School of Nursing at 336-258-1024 or by email at saletvak@uncg.edu.

If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity at UNCG toll-free at (855)-251-2351.

Are there any benefits to society as a result of me taking part in this research?

Sepsis continues to have a high mortality rate. The benefits to society related to this research may have a positive impact on patient outcomes.

Are there any benefits to *me* for taking part in this research study?

There are no direct benefits to participants in this study.

Will I get paid for being in the study? Will it cost me anything?

There are no costs to you, or payments made for participating in this study.

How will you keep my information confidential?

All information obtained in this study is strictly confidential unless disclosure is required by law. Once the audio recording is transcribed, the audio portion will be erased. Only the Principal Investigator and Committee Chair will have access to view the data transcribed. All data will be secured in a locked file, and electronic copies placed in a secure location at UNCG Box. No names of the participants will be used in this study.

What if I want to leave the study?

You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state.

What about new information/changes in the study?

If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

Voluntary Consent by Participant:

By participating in this focus group you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered.

APPENDIX B

INFORMATION FLYER

What's this all about?

We are looking for volunteers to participate in a Research Study

Title of the Study: Nurses' knowledge regarding nursing surveillance specific to the septic patient

Purpose: The purpose of the study is to examine the use of nursing surveillance when caring for the septic patient and any identified barriers.

Details: This is a qualitative study using the focus group approach. The focus group approach allows for dialogue among group members answering questions and sharing their understanding and beliefs.

The maximum time commitment is 60 to 90 minutes.

Participant Qualifications: Registered Nurses with at least six months nursing experience and has provided care to a patient with sepsis.

Participant Qualifications: Registered Nurses with at least six months nursing experience and has provided care to a patient with sepsis.

This study is part of the PhD requirement for Paul LeBlanc, RN, MSN a student in the nursing PhD program at the University of North Carolina Greensboro.

If you are interested in participating in the focus study please notify:

Paul LeBlanc at phleblana@uncg.edu or call/text to 919-943-1440

Thank you

APPENDIX C

INTERVIEW GUIDE

Prework:

Room set up

Area set up so focus group members are facing each other to encourage conversation

Refreshments available

All participants have signed the consent to participate

Collect all material in a confidential file

Welcoming participants:

Welcome everyone. Thank you for taking the time to participate in our discussion of the Nurses' knowledge of nursing surveillance and barriers as it relates to the septic patient. You were invited to participate in this study because of a recommendation by your leader or your experience in providing care to the septic patient.

This is a confidential focus group. We will not use your name(s) in the report of this study. We ask that all participants keep discussions in this room confidential. Although we do the very best we can to have all discussions confidential, I cannot assure total confidentiality if group members choose to speak outside of the group.

During this research study focus group, I encourage you to express your views, even if you think the views are different than the group or you think that what you have

to say is not important. Any differing points of view will add greatly to the conversation and ideas expressed may give us insight that we may not have thought of otherwise.

Introductions: Research team

PI/Moderator

Assistant Moderator (if Present)

Have the group go around the table and introduce yourself, where you work and your favorite pet or child (could be both)

Interview Questions and Prompts

Opening question:

Q1. Tell me about your experiences caring for a septic patient.

{*This introductory questions will introduce the topic and allow for the focus group participants to begin to think about their experiences and connections with the topic.}*

Transition questions

Q2. Can you describe for me what nursing surveillance means to you.

Q3. Can you describe what is involved with initiating a bundle for the septic patient?

Q4. Tell me about your experiences regarding any barriers that might inhibit your ability to provide nursing surveillance for the septic patient.

Q5. At the end of your shift, how do you feel about the care you were able to deliver for your septic patient?

Q6. If you were asked by your leader what could we do to improve the care of the septic patient, what would you say?

Prompts

Prompts are used in qualitative descriptive inquiry to guide the study participant to keep the conversation going if needed. If the focus group participants seem to lack understanding regarding nursing surveillance the following prompts may be used.

Nursing surveillance includes

(a) the act of collecting patient data during assessments including physiological, laboratory values or other data available

(b) evaluation of trending data changes and/or being aware of these changes

(c) reporting findings to providers

(d) initiating orders and re-evaluating outcomes

Additional prompts include:

"Would you explain further"

"Can you give us an example"

"Would you say more"

"Is there anything else you would like to say"

"Please describe what you mean"

Summary

Provide a short oral summary of the work:

Summary of findings during the session

Include the statement regarding confidentiality:

This is a confidential focus group. We will not use your name(s) in the report of this study. We ask that all participants keep discussions in this room confidential.

Although we do the very best we can to have all discussions confidential, I cannot assure total confidentiality if group members choose to speak outside of the group.

Ending questions

Q7. Is there anything else you can tell me about your ability to care for septic patients?

APPENDIX D

PERMISSION TO USE CONTENT

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