

2016

An Evidence-Based Educational Intervention to Improve Nursing Staff's Critical Thinking and Decision-Making Skills

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Walden University

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Rene Barron-Kagan

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2016

Abstract

An Evidence-Based Educational Intervention to Improve Nursing Staff's Critical

Thinking and Decision-Making Skills

by

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MSN, University of New Mexico, 2009

BS, University of Phoenix, 2000

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

August 2016

Abstract

Hospitalized patients in acute care settings are at a high risk of developing health complications that can eventually lead to failure to rescue (FTR) situations. The aim of this project was to deliver a structured comprehensive medical-surgical competency plan for acute care nurses to detect deterioration in a patient's condition through the triad of assessment model to promote clinical reasoning among acute care nurses. Data were collected using pretest surveys, a demographic sheet, and an evaluation survey. A convenient sample of between 22 and 29 nursing staff was recruited from three medical-surgical inpatient units at a VA Hospital. The pretest survey, administered simultaneously with the educational modules, assessed participants' baseline knowledge on components of the triad of assessment model and the processes involved in the prevention of FTR. The pretest scores for modules 1 to 6 were 2, 3, 3, 3, 2, and 3 respectively. The posttests scores for modules 1 to 6 were 4, 5, 5, 5, 4, and 5 respectively. The nurse's aides also recorded posttest scores of 4.6 for both Pulse Oximetry and orthostatic hypotension modules. The t-test ($p < 0.00$) showed a significant difference between the pre and posttests scores, thus, indicating an improvement in nursing staff's knowledge regarding the triad of assessment model. Thus, it is important to adopt a comprehensive medical-surgical plan for acute care nurses institutional-wide. This project contributes to social change through identification of a medical-surgical intervention that improves nurses' critical thinking skills, thereby promoting patient satisfaction and safety. Because nurses play a significant role at the bedside, improved critical thinking skills will facilitate a significant reduction in FTR rates, heighten patient satisfaction, and enhance the nurse-patient relationship.

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Dedication

To my son Kyle, my parents Norton and Elizabeth Barron and to my significant other Afshin Jian, thank you for tolerating me during my DNP process. You all were patient and supportive. I will never forget this.

Acknowledgments

I would like to acknowledge Dr. Mary Verklan for her support throughout this process while I balanced work, personal life and Doctoral studies. I would also like to thank Dr. Kathleen Brewer for her feedback after the final oral defense and Dr. Debra Rose Wilson as a committee member. Thank you Dr. Cynthia Nuttall, my preceptor, for providing your guidance and support. Finally, I would like to acknowledge and thank Anna von Dielingen, my mentor, who I spent a majority of the time with during the practicum experience. She was supportive, patient, engaged and passionate through the entire practicum experience and she will always be a friend and in my heart.

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Section 1: Overview of the Evidence-Based Project

Introduction

The lack of early detection in a patient's status, especially in an acute care setting, can result in critical illness and transfer to the intensive care unit (ICU). Because causal vital signs, laboratory data, and empirical assessment are the nurse's assumed responsibility, it is imperative that behavioral principles and subsequent management techniques occur concurrently with the practicum. Unfortunately, there is a lack of appropriate transfer of textbook principles to clinical practice. Surveillance of patient status, early recognition of abnormal assessment findings, and vigilance in taking measures to correct abnormal assessment findings can all lead to rescue versus FTR.

In this doctor of nursing practice (DNP) project, I addressed patient assessment, which encompasses physical assessment; checking for vital signs; analyzing laboratory data; and the associated conceptual processes of surveillance, early recognition, vigilance, and FTR in relation to critical thinking skills among nurses. FTR is the breakdown of patient assessment and, therefore, formed the conceptual basis for this DNP project. I designed and implemented a comprehensive medical-surgical competency education plan to provoke critical thinking and provide information on proper assessment and application to medical-surgical competencies. The plan includes education of nurses on patient assessment, introduction and application of a triad of assessment model, and education on how and when to notify either a physician and/or rapid response teams (RRTs).

The project explained how the triad of assessment model and the associated conceptual process is applied to the medical-surgical education plan. Further, I described

how the concepts of surveillance, early recognition, and vigilance relate to FTR. In addition, I addressed how nurses can use the triad of assessment model to improve critical thinking skills and how assessment data can improve correlations between the assessment data points such as vital signs, laboratory data, and physical assessment findings. The triad of assessment model would enable nurses to correlate specific assessment findings effectively to develop an ability to clinically analyze and appropriately manage a deteriorating patient's status. Nurses may be able to formulate a clinical plan based on the assessment findings. In this project, there are also discussions on the nurse's ability to notify the physician using clinical reports of the patients' conditions and implement early interventions. The discussions in this project are meant to increase the chances of rectifying the patients' conditions, thus reducing FTR rates.

Problem Statement

According to Odell (2010), patients in acute care settings may experience unexpected physiological deterioration that may lead to critical illness, and transfer to the ICU. However, in most cases, patient deterioration can be detected through patients' physiological signs such as changes in respiratory rate (RR) (Cuthbertson et al., 2007; Goldhill & McNarry, 2004) and blood pressure (Cuthbertson et al., 2007; Hillman et al., 2001), or by physiological findings such as a deteriorating mental status (Jacques et al., 2006). Although changes in the patients' conditions can be monitored and detected by unit nurses, these findings can be missed or misinterpreted (The National Confidential Enquiry into Patient Outcome and Death [NCEPOD], 2005; National Patient Safety Agency [NPSA], 2007a).

Physiological deterioration has been the topic of numerous critical care studies (McGloin et al., 1999; McQuillan et al., 1998; Schein et al., 1990). Subbe and Welch (2013) noted that FTR is the inadequate or delayed response to clinical deterioration in hospitalized patients. Early recognition protocols and rapid response systems are a set of hospital-wide interventions that attempt to reduce FTR by improving patient monitoring on acute care units. Jones, Bottle, and Griffith (2011) viewed FTR as a failure to prevent a clinically important deterioration resulting from a complication of an underlying illness, such as cardiac arrest, in a patient with acute myocardial infarction, or a complication of medical care, such as a major hemorrhage after surgery.

However, attention on FTR has renewed in most acute care facilities as a result of the introduction of the National Institute for Health and Clinical Excellence (NICE) clinical guideline for recognition and response to acute illness in adult patients (Armitage et al., 2007). This publication was developed in response to reports that deteriorating patients would frequently experience delays in receiving adequate care, resulting in incidences of preventable deaths (NPSA, 2007). The role of nurses in early recognition of deteriorating patients' conditions and FTR is highly reliant on nursing care and has been broadly advocated (Griffith et al., 2008). RRTs provide a solution to the deficit in early recognition and they have been implemented in several hospitals. The RRT consists of expert critical care nurses who track the patients' physiological signs when parameters deviate and convey the information to the care provider (DeVito et al., 2004; Goldhill et al., 1999; Lee, 1995; Morgan et al., 1997). RRTs can help nurses assess the deteriorating patients while the nurses attend to other patients.

Literature has shown inadequate patient assessment can lead to FTR. When a nurse fails to recognize a complication or respond in a timely manner, death or permanent disabilities may occur (DeVito et al., 2004). However, these occurrences can be avoided if acute inpatient nursing units adopt safe practices and implement systems that facilitate patient safety (DeVito et al., 2004). FTR was considered by DeVito et al. (2004) to be a measure of a hospital's lack of quality and is more dependent on hospital characteristics rather than patient acuity.

The FTR concept is rich in scientific underpinnings. In the 1850s, Florence Nightingale advocated the concepts of vigilance and surveillance. Vigilance was defined by Hirter and Van Nest (1995) as the psychological and physiological preparedness to act and the ability to identify and respond to any danger. Surveillance involves frequent assessments and the nurse's ability to analyze patient information and react to the implications in a timely manner (Meyer & Lavin, 2005). Maupin (2013) estimated that within 24 hours before admission to the ICU, 80% of hospitalized patients had physiological parameters outside normal ranges. In addition, up to three-fourths of these patients suffered at least one potentially life-threatening event in the 8 hours preceding ICU admission (Maupin & 2013).

Maupin (2013) recognized that staff commonly failed to recognize warning signs and, therefore, did not intervene appropriately or failed to transfer patients to the ICU in a timely manner. The main components to a nurse's vigilance include attaching meaning, anticipation, calculating risk, and monitoring results or outcomes (Meyer & Lavin, 2005). Proficiency in these areas is essential in helping nurses determine the etiology of deterioration of patients' conditions. It is precisely the ability to discern and evaluate the

correlation of each assessment component that nurses must improve. When interconnected, these components can promote early recognition of patient problems to prevent FTR.

Purpose Statement and Project Objectives

The purpose of this project was to deliver a structural assessment model that would support the process of clinical reasoning for nurses. The main objective was to provide a foundation for clinical nurses, at all levels of development, to organize assessment findings in a model format that would enable them to correlate the relationship of the components. In collaboration with a medical-surgical clinical nurse educator, I developed a comprehensive medical-surgical competency plan to support the improved care for the military veteran population. The purpose of the DNP project was to (a) improve patient outcomes (decrease adverse events, transfers to the ICU, and death) by implementing a comprehensive medical-surgical competencies plan /education along with a posttest evaluation; (b) focus on critical thinking among nurses; (c) facilitate early recognition of changing patient status by nurses; and (d) instruct on how to utilize the RRTs. The need for improved quality of care by nurses has been identified by physicians, nurse managers, the Veterans Administration (VA), and other staff members. The necessity was for better assessment and skillful response to a patient's change in health status that may cause FTR. In this DNP project, I employed the use of Quantitative data and a review of empirical literature to support the findings. Through improved critical thinking skills and the application of the triad of assessment to medical-surgical competency and professional practice, nurses would be better equipped to assess and respond to deteriorating patient status in a timely manner.

In this DNP project, I focused on improving monitoring and expedient response to impending patient problems on inpatient acute care nursing units. The reliability of improving critical thinking skills and educating nurses to better assess patients requires (a) high-quality recording of vital signs, (b) the education and mind-set of staff at the bedside to recognize pathological patterns, (c) the reporting of abnormality to either the rapid response team or provider, and (d) a timely and appropriate response to the situation. The three medical surgical units were provided with the medical surgical competency plan to achieve these goals. The units received training to put into practice the triad of assessment (Appendix A) and accompanying processes applicable to each competency. This training included unique patient variables and axiomatic criteria requiring RRT/provider notification. Physicians and nurses collaboratively developed the specific reporting criteria.

A primary objective of this DNP project was to introduce a simple at-a-glance assessment tool and consequent educational intervention that would help nurses consistently perform assessments and respond appropriately to abnormal vital signs, labs, and assessment data during rounds. The education included variables unique to each patient. For example, with a patient who is asymptomatic but has a reportable pulse rate of 45 beats per minute, the nurse must think critically to determine whether the patient is taking a beta-blocker to the bradycardia. The objectives were intended to make nurses use the tool as a reference to the triad of assessment and use abnormal numeric reporting criteria to notify the RRT or provider.

After development, the triad of assessment tool (Appendix A) had quantifiable data including abnormal vital signs, abnormal lab values, abnormal assessment findings,

and viable parameters, which prompted the nurse to notify an RRT or a provider in case of deterioration of a patient's condition. The specific parameters were developed by nurse educators, administrators, and physicians to meet the needs of the facility. The parameters are intended to enable the nurses to recognize accurately early signs of deterioration, sepsis, and changes in status based on the vital signs.

Significance/Relevance to Practice

Exploring the ongoing problem of FTR is significant and relevant to nursing practice. As previously discussed, approximately 80% of hospitalized patients exhibit physiological parameters outside normal ranges within 24 hours before admission to the ICU (Maupin, 2013). In addition, up to 75% of hospitalized patients suffer at least one potentially life-threatening episode in the 8 hours preceding ICU admission (Maupin, 2013). Such scenarios have been well documented and they continue to be a challenge for health care institutions. This DNP project has the potential to elicit results proving that education plans and assessment tools can help nurses to assess their patients better and recognize those signs of deterioration and therefore reduce FTR rates.

According to Minick (1995), early recognition of patient deterioration is a vital aspect of excellent clinical practice. Minick suggested that the capacity of care providers to recognize subtle changes in patients' well-being had a close association to the level of care that occurs between provider and patient. This caring translates into connections between nurses and patients and therefore, enhances nurses' motivation and capacity to assess subtle queues of impending decline in patients' health (Minick, 1995). In addition, acknowledging and responding to the situations intuitively can help a nurse handle the situation more efficiently. Despite an effective nurse-patient relationship facilitating the

detection of deteriorations in patient condition, it cannot be translated to caring.

However, the creation of an effective nurse-patient relationship can be viewed as a multifaceted aspect of nursing, which includes having a clearly articulated perspective on nursing practice, gleaned from empirical, ethical, aesthetic, and personal knowledge, and practicing from a caring framework. This reasoning is closely integrated with the main objectives of this project. Expedient detection of subtle patient changes includes striving to understand what is going on with the client, becoming emotionally involved beyond the nurse-patient relationship, and intervening on the behalf of the clients when they are unable to function for themselves (Minick, 1995).

Project Questions

In this project, I addressed the following research questions:

1. Will a comprehensive medical-surgical competency plan on assessment increase nurses' ability to recognize early signs of a patient who is clinically deteriorating?
2. Will a comprehensive medical-surgical competency plan increase nurses' ability to think critically and intervene appropriately?
3. Will the posttest results confirm a nurses' (a) grasp of definitive criteria indicating a patient's declining status, (b) understanding of how and when to notify the RRT, and (c) ability to recognize unforeseen variables which have contributed to inadequate assessment and may have led to FTR?

Evidence-Based Significance of the Problem

Through crisis intervention and monitoring unexpected patient events, nurses make a significant contribution to minimizing errors that may result in FTR on a daily basis. The nurse's behavior while responding to a deteriorating patient condition can

positively affect the patients' health and may be useful in studying differences in patient outcomes during care provision. According to Maupin (2013), failure of clinical staff to recognize warning signs, determine whether patient interventions are executed appropriately, or ensure patients are transferred to the ICU in a timely manner, results in increased risk of FTR. In addition, after implementation of early recognition systems, hospitals could experience (a) fewer code blue calls, (b) a sharp increase in calls to the rapid response team, (c) a decrease in mortality rate from 2% to 6% in an approximately 8-month period, and (d) with the early recognition objective data, nurses' confidence when calling the physician increased (Maupin, 2013). This DNP project was aimed at improving knowledge on FTR and understanding nurses' competencies and characteristics that can prevent FTR and improve the nurse-patient relationship in an acute care setting.

Implications for Social Change in Practice

The concept of FTR is turning out to be a useful indicator in understanding the relationship between nursing care and patient outcomes. Although research on entire nursing staff's role in improving patient outcomes remains important, studies on the contribution of individual nurses to patient outcomes are necessary. Through the use of pre- and posttests, I conducted this DNP project with the aim of providing a perspective of nursing care from an individual nurse's perspective while considering the role of nurse-patient and nurse-physician relationship in reducing FTR.

As changes in reimbursement come to place, health care institutions would now be required to maintain high levels of vigilance and monitoring of patients with chronic health conditions. As a result, nurses are expected to improve their critical thinking skills

and competence to ensure that FTR cases are minimized. In addition, the new requirements by the Centers for Medicare and Medicaid Services (CMS) on payments for hospital-acquired conditions depend on the nurses' ability to prevent adverse patient events and identify vital patient signs that might be present during admission (CMS, 2014).

Through this DNP project, I aimed to involve policymakers in the effects of nurses on patient outcomes and safety and recommend further improvements in FTR strategies. As previous studies suggest, improvement of the nurses' working environment and interactions between nurses with patients and physicians is an important indicator of positive patient outcomes. Therefore, the study of FTR and the ability of nurses to prevent FTR enable health care institutions to identify the strengths and weaknesses of nursing practice which can be used in the formulation of new interventions to reduce FTR and improve patient outcomes.

Patient safety is a key indicator of the quality of care provided by health care institutions. By reducing FTR rates, health care institutions would improve the quality of health, patient satisfaction, and reduce costs of treating complications resulting from FTR (Hodgetts et al., 2002). Therefore, through continuous research on FTR, the sources of various patient safety concerns can be identified and possible solutions recommended. According to Morse (2006), *FTR* may become the catchphrase of the decade. As methods used to assess the quality of care evolve, the analysis of FTR has become a part of a systemic change in nursing practice and medicine. Therefore, prioritizing the safety of hospitalized patients through effective surveillance and monitoring of patients with high risk of developing adverse patient events is important for every health care institution.

Hospitals are increasingly communicating outcomes, and consumers are asking more questions. In this case, and more specific to the project's intended population, military veterans.

In general, FTR is the nursing or medical staff's lack of an appropriate and timely response to changes in a patient's condition or status which could have influenced the patient's outcome (Morse, 2006). Deaths resulting from FTR are preventable if a process is put in place to guide a more efficient response of the health care team. There are many potential variables involved in FTR such as system issues, staffing issues, and lack of access to the proper assistance, inadequate levels of education, and varied expertise among nurses. As asserted by Morse, a proper response to changes in patients' conditions is extremely important. Most patients want to be assured that they will be safe and cared for efficiently if a problem arises. Nurses are at the forefront of this assurance by performing frequent surveillance, recognizing potential problems expeditiously, and remaining vigilant once a problem is recognized. Changing a hospital's culture to one that is more proactive would involve in-depth deliberations on matters of mortality and morbidity, and require a continued strong involvement of the nurses. However, nurses as humans are prone to error. Therefore, the health care system should strive to improve the nurses' ability to rescue patients through training to improve their critical thinking, vigilance, and monitoring skills.

Definition of Terms

Failure to rescue: Failure to prevent a clinically important deterioration, such as death or permanent disability from a complication of an underlying illness (e.g., cardiac arrest in a patient with acute myocardial infarction) or a complication of medical care

(e.g., major hemorrhage after thrombolysis for acute myocardial infarction) (Agency for Healthcare Research and Quality [AHRQ], 2014).

Rapid response teams (RRTs): An RRT refers to a group of clinical staff who can be contacted and assembled as quickly as possible to provide care to critically ill patients in case of deterioration of the patient's health condition (Resuscitation Central, 2010).

Early recognition: Detection of subtle harbingers of impending demise (Swanson, 1995).

Surveillance: Frequent assessments and the nurse's ability to analyze information and react to the implications of those analyses in a timely manner (Meyer & Lavin, 2005).

Vigilance: As cited by Meyer and Lavin (2005), Hirter and Van Nest (1995) defined *vigilance* as a "state of watchful attention, of maximal physiological and psychological readiness to act and of having the ability to detect and react to danger" (p. 96).

Assumptions and Limitations

In this project, I assumed that if nurses of medical surgical acute inpatient units are provided with a medical-surgical protocol for proper assessment of their patients, they would be able to recognize earlier signs of clinical deterioration in their patients. I also assumed that if nurses are educated on specific criteria essential to RRTs, subsequent early intervention could reduce disability or prevent unwarranted deaths. In addition, I assumed that nurses were willing to learn the content in the competencies and that they would use their clinical reasoning, correlate assessment findings, and not hesitate to call a physician when a patient's condition is deteriorating.

There were several limitations to the fruition of this DNP project. During an early practicum experience, the modified early warning systems (MEWS) were introduced to nursing staff, managers, and the internal medicine group. Unfortunately, it was not deemed suitable for the facility. This resulted in a change of course and a need for redesign of this DNP project. The feedback from a few of the physicians clearly indicated their lack of confidence in the early warning criteria and their opinion was that the MEWS would not fit the current system for the facility. However limiting, introducing the MEWS and the early recognition process spurred conversation and unified my intent to develop a more tailored set of criteria better suited for the facility, as well as to pursue methods of quality and systemic improvement. Conducting the medical-surgical modules while the nurses were working their shifts also limited this DNP project. Despite delivering competencies succinctly and efficiently, it was challenging to get the nurses off the unit in a timely manner so they could attend the presentation and participate in the in-services.

Summary

FTR has been and is still a significant problem in nursing practice. As described by Subbe and Welch (2013), FTR is the inadequate or delayed response to clinical deterioration in hospitalized patients. This inadequacy has been documented as a major contributory factor of transfers to ICU and unexpected patient deaths not only nationally but at the practicum site as well. Early recognition of a declining change in patient status, adequate surveillance, and vigilance are all necessary in reducing transfers to the ICU. A consequence that is more important is the decrease in needless and unexpected deaths among patients with chronic diseases. The physicians at the practicum site designated for

this DNP project had expressed a lack of confidence in care provided to their patients on the medical-surgical nursing units. However, with other contributing factors present, most physicians perceived that nursing staff failed to adequately assess and monitor patients, resulting in unnecessary transfers to the ICU and unexpected deaths.

Section 2: Review of Scholarly Evidence and Theoretical Frameworks

Introduction

Lack of early detection of patient's change in status is still a challenge in acute care settings and can lead to FTR. FTR depends on the degree in which providers respond to adverse occurrences that develop during a shift and may reflect the quality of assessment, the effectiveness of actions taken once early complications are recognized, or both of these variables (AHRQ, 2015). In this chapter, I focus on the scientific literature published in peer-reviewed journals and reputable websites that discuss how critical skills, assessment tools, and nurse education affect adverse patient events.

Literature Search

I conducted a systematic literature review using Medline, EBSCOhost, PubMed, Bioline International, Embase, and Cochrane Database of Systematic Reviews. I used the following search terms: *nursing practice, nurse learning models, primary care models, chronic illnesses, models of care, medical assessment models, nursing professional development, clinical competence, continuous education, critical thinking in patient care, and quality improvement initiatives*. After identifying the relevant journal articles and books, I conducted a manual selection of the relevant studies published between 2000 and 2015. A total of 102 journal articles, books, and websites contained relevant information for this study. However, I only used 70 articles for this study.

Specific Literature

The safety of patients with chronic conditions is paramount to health care institutions. Numerous publications and recommendations have identified patients with

chronic conditions as having the highest likelihood of receiving poor care (Clarke & Aiken, 2003; Francis, 2013 NCEPOD, 2005; Silber et al., 2007). Failure to provide adequate care to patients can have significant effects on their health, which may lead to death. In this section, I review the literature on FTR, early recognition models, and medical competency plans applied by nurses in chronic care provision with the aim of illustrating the association between FTR, early recognition models, and medical assessment plans.

Failure to Rescue

FTR refers to the failure to prevent a patient's deteriorating condition which either results in death or further complication of an underlying illness (Silber et al., 2007). Bucher (2013) defined *FTR* as the inability to save a hospitalized patient's life when he/she experiences a complication. Bucher further articulated that a complication is a condition that was not present on the admission of the patient.

FTR may also be defined as the clinician's inability to save a patient's life in case of a complication which is not apparent on admission (Clarke & Aiken, 2003). Cardiopulmonary arrest/shock, pneumonia, upper gastrointestinal bleeding, venous thromboembolism (VTE), and sepsis are examples of some of the complications, which may result in FTR. FTR is a critical area of nursing care because it is the nurse's responsibility to identify any deterioration in the patient's condition in its early stages and initiate any action to stabilize the patient (Griffiths et al., 2008). Essentially, FTR is a situation in which the nurse does not realize what is missed and is not able to correlate or utilize appropriately, his or her explicit control to rectify the situation. To rescue a patient expediently and appropriately, a nurse must be able to anticipate when complications are

likely to occur and quickly recognize cues that indicate problems in the patients' condition.

The most commonly used indicators of FTR are the mortality rates among the patients who experience life-threatening complications which can only be corrected by appropriate and timely interventions. These indicators are usually based on hospital administrative data that have relied on the identification of patients who experienced certain complications and, therefore, the validity of the data may be compromised in cases of poor secondary diagnosis (Garvey, 2015). Due to this limitation, and for the purpose of tackling the problem of low coding of complications, two alternative approaches exist. The first approach is based on the assumption that all deaths after surgery are cases of FTR and in most cases death during surgery results from complications, whether or not the complications are recorded in the administrative data (Silber et al., 2007). As a result, providers with poor coding are not given a leeway by the exclusion of deaths from such cases during consideration for FTR. The second approach recognizes that not all FTR cases lead to death and that complicated recoveries take more time than uncomplicated ones. Therefore, if there is a serious deterioration due to FTR, which results in an extended stay in a hospital, then the stay can be used as an indirect indicator of FTR (Rafferty et al., 2007).

According to Kane, Shamliyan, Mueller, Duval, and Wilt (2007), there is more validation of FTR indicators for surgical patients compared to medical patients. However, FTR patient safety indicators from the AHRQ in the past included medical patients. These indicators were later dropped due to failure to identify adequate FTR cases using administrative data sets (Stanton & United States, 2003). In addition, researchers have

found associations between high levels of staffing and low incidences of FTR in surgery, but evidence of similar association for medical patients is not available (Kane et al., 2007).

FTR may result in permanent disabilities, which arise as a result of the lack of medical care or unrecognized underlying illness (Kane et al., 2007). The definition of *FTR* and the determination of complications during admission have elicited much controversy in the recent past. In the past, research on FTR centered only on surgical patients who died within 30 days of developing postoperative complications (Kane et al., 2007). However, with time, it was agreed that the term be used for measuring the quality of patients' care due to the influence of hospital characteristics (Friese & Aiken, 2008). Initial studies evaluated patients who suffered from pneumonia, trauma, internal bleeding, and other diseases, which could lead to death and labeled them as FTR (United States Department of Health and Human Services, n.d.).

FTR is a key indicator of nursing care in the United States, and its presence is associated with the nurse's education, experience, and level of preparedness (Friese & Aiken, 2008). Clarke and Aiken (2003) reiterated the importance of keeping staffing levels for nurses high to ensure that nurses notice subtle changes in the patients' condition that could indicate potential complications. The nurses' working environment is also an important aspect when it comes to patient outcomes. According to Friese and Aiken (2008), a perfect environment for nurses is a place where health care workers understand the nurses' authority to act in the interest of patient safety irrespective of the practice environment.

Acquaviva, Haskell, Johnson, and Quality and Safety Education for Nurses (QSEN) (2013) discussed the importance of the quality and safety of patient care. In this case study, Acquaviva et al argue that power and authority play a key role in addressing most of the issues facing nurses. As physicians continue to express concerns about the quality of nursing care, nurses have also expressed their lack of power and authority when attempting to advocate for their patient at the practicum site. The lack of teamwork leads to poor communication between physicians and nursing staff, thus may result in death as seen in the case of 15-year old Lewis Blackman (Acquaviva et al., 2013).

Meyer and Lavin (2005) evaluated the concepts of surveillance, early recognition, and vigilance as it applied to patient assessment and FTR. The findings of this study indicated that surveillance, early recognition, and vigilance can remind nurses to monitor patients adequately and to assess for subtle changes in physical assessment findings, laboratory data, and vital signs/triad of assessment (Meyer & Lavin, 2005). Surveillance, which involves frequent assessments, is the ability to analyze information and react to the implications of the analysis in an efficient and timely manner (Clarke & Aiken, 2003). Reacting to assessment findings and intervening appropriately are the result of professional nursing vigilance and would often include both independent nursing action and mobilization of other members of the health care team such as RRT's and providers.

Integral to the concept of FTR, surveillance involves assessing patients frequently, attending to cues, and identifying complications (Clarke & Aiken, 2003). When nurses are assigned to care for too many patients, their ability to monitor and evaluate recorded information may fail (Friese & Aiken, 2008). Novice nurses are usually vulnerable and can be overwhelmed by excessive patient load (Meyer & Lavin, 2005).

Therefore, more experienced nurses should be available for consultation and to provide support to the novice nurses while they observe patients for early signs of deteriorating status (Clarke & Aiken, 2003).

Careful assessment, good communication, and early recognition of and response to emergent situations are desired when a patient's status deteriorates. Therefore, it is important to empower nursing staff who are qualified to supervise and mentor novice staff (Clarke & Aiken, 2003). FTR cases are preventable (Risk Management Foundation [RMF], 2014). However, physicians and nurses may encounter various unrelated symptoms during the diagnosis of a chronic disease, which makes treatment difficult. These challenges include poor team performance, lack of clear roles, poor communication, and lack of proper training of nursing staff (Jones et al., 2006). Lack of clearly set roles can be corrected by the introduction of mandatory education on FTR and RRTs. Leonard et al. (2010) argued that most of the errors in FTR cases are caused by poor communication. In addition, Leonard et al indicated that factors such as training of physicians and nurses to communicate differently, the hierarchical nature of communication, and lack of standardized communication procedures in health care institutions can inhibit communication, thus causing Rapid Response System (RRS) delays. Diagnostic challenges can also arise from poor diagnostic, overreliance on diagnostic tests in place of physical assessment, lack of conveying sense of urgency in critical situations and variations in knowledge, skills, and willingness to escalate general clinical inexperience risk (RMF, 2014).

A number of strategies can be employed to reduce the risk of FTR (RMF, 2014). First, it is important to train nursing staff on how to identify signs of deteriorating patient

conditions and how to use MEWS effectively. Training of nursing staff ensures that the affected patients receive quick medical attention to prevent the risk of developing complications, which may lead to FTR (RMF, 2014). Training of nursing staff through simulations based on communication skills, situational awareness, utilization of chain command, and debriefing is also important in imparting new skills to nursing staff. Simulation training equips the nursing staff with practical skills and improves their grasp on crucial patient conditions and the procedures that should be applied when patient's condition deteriorates. Employing multidisciplinary rounds improves the nurse-patient relationship, thus, enhancing the nurses' knowledge of the patients' medical history and reducing the likelihood of FTR through improved vigilance. Creating safe environments, where clinicians do not fear negative responses to an escalation of a clinically deteriorating event, is also important in improving the nurses' skills. By taking responsibility for a patient's condition, the nurses get the chance to apply their clinical knowledge and improve their decision-making skills. Creation of systems for ongoing surveillance of chronically ill patients is also important in that it ensures early detection of the patient's physical behavior, thus, reducing the likelihood of FTR situations. Lastly, structuring of the methods and means for communication is important for all health care institutions because effective communication ensures free and rapid flow of information within the health care organization, thereby, preventing delays in providing critical care (RMF, 2014). These strategies ensure that RRTs are alerted of any deviation in the patients' health in time, hence, minimizing the likelihood of FTR.

Early Recognition Models

Research shows that early signs and symptoms such as changes in pulse rate and irregular breathing patterns are noticeable whenever a patient's condition is deteriorating (Bergeron, Dubois, Dumont, Dial, & Skrobik, 2001). Therefore, if treatment for such patients is delayed, there is an increased risk of complications arising which may lead to death or admission to an ICU. One way to identify and treat patients whose conditions are worsening is by the use of outreach services like Early Warning Score (EWS), which record the patients' physiological observations. However, despite being effective, the EWS is not always the best option for every hospital (Gardner-Thorpe, Love, Wrightson, Walsh, & Keeling, 2006).

A patient's deteriorating condition is usually followed by significant physiological changes that are recorded by the nurses 6 to 24 hours before a series of adverse events (Kause et al., 2004). The clinical staff's failure to oversee basic vital signs and symptoms can be linked to the lack of consultation, poor supervision, lack of urgency, and ineffective or lack of basic skills such as resuscitation techniques (Subbe & Welch, 2013). Though little research has been conducted on the sensitivity, specificity, and importance of EWS, its introduction has reduced the nurse's workload by providing alerts whenever a patient's condition starts deteriorating (Goldhill & McNarry, 2004). However, other researchers doubt the effectiveness of EWS in predicting patient outcomes and critical illnesses (McCrossan, Peyrasse, Vincent, Burgess, & Harper, 2006; Massey, Aitken, & Chaboyer, 2010). Thus, health care providers should take into account the problematic nature of EWS and realize that its adoption does not necessarily guarantee improved clinical outcomes (Subbe & Welch, 2013). This is because EWS

tools focus mainly on objective data using routine signs with little or no reference to the patient's qualitative characteristics. However, the use of MEWS is useful for nurses working in busy clinical areas and may help in early detection of patients at risk of deterioration and when urgent attention is required (McCrossan et al., 2006). The use of MEWS ensures that the patient's health condition is salvaged at an early stage, thus, preventing complications arising to delays and thereby preventing FTR.

Gardner-Thorpe et al., (2006) also evaluated the importance of MEWS in surgical in-patients. Gardner-Thorpe et al recorded the MEWS of 334 ward patients with the transfer of Intensive Therapy Unit (ITU) or High Dependency Unit (HDU). The MEWS algorithm consists of an escalation pathway which records values greater than or equals to 5 for patients at high risk of FTR and any deviations of two points from the previous score. If the score is less than or equals to 4, the patient is reassessed twice after every hour and a check for vital signs is done after four hours. On the other hand, if the score is greater than or equals to 5, a physician is consulted to either call the RRT or transfer the patient to higher level care. The findings indicated that 17% of the patients recorded scores greater than four on MEWS, thus triggering the call-out algorithm, while 5% were admitted to the ITU or HDU (Gardner-Thorpe et al., 2006). Gardner-Thorpe et al. (2006) argued that MEWS are important and an effective risk management tools when used collaboratively with the call-out algorithm system and should, therefore, be implemented for all surgical patients. Again, the MEWS was not implemented at the practicum site due to reluctance from physicians.

Medical Competency Plans

Various concerns have been raised by educators and supervisors about the development of good standards of primary patient care (Scalese, Obeso, & Issenberg, 2008). Training of nurses involves a thorough schedule that encompasses clinical experiences with patients and real life scenarios under the supervision of qualified and licensed professionals who assess their performance (Brown et al., 2012). Therefore, clinical faculties need to educate future nurses and other professionals on how to deal with challenges in their careers, with special consideration to effective critical thinking and decision-making skills (Davies, 2008).

As the mode of delivery of health care services undergoes changes, both locally and internationally, so does the role of nurses (Scalese et al., 2008). Nurses are required to develop competencies that will enable them to assume leading roles in health promotion, education, counseling, and caregiving (Batalden, Leach, Swing, Dreyfus, & Dreyfus, 2002). Education programs for nurses need to ensure that nurses acquire the essential competencies that will enable them to provide quality patient care in an ethical manner (Batalden et al., 2002).

The framework of the nursing practice has hugely influenced the assessment plans for nurses due to its problem-solving nature (Scalese et al., 2008). Health care institutions give more priority to assessment of needs over the establishment of eligibility criteria (Department of Health (DOH), 2003). Batalden et al. (2002) argued that the quality of assessments can be enhanced if the clients and caregivers work collaboratively in the care process while putting the client's needs as a priority. As iterated, the focus of this project

was on increasing awareness of the need for better assessment of patients through education and diligent follow-up, with the aim of decreasing FTR situations.

General Literature

In this section, I review the literature on critical thinking, the use of assessment tools, nurse education, and training in patient care. By constructing this section, I aim to evaluate the role played by each of these factors in the prevention of FTR cases in hospitals. This section has been divided into four categories: Critical thinking in patient care, use of assessment tools in patient care, nurse education and training in patient care, and an exploration of the Chronic Care Model (CCM).

Critical Thinking in Patient Care

The need for critical thinking in patient care has been underscored by the rapid changes in the United States health care system. It is the duty of nurses to think critically to ensure effective patient care while coping with the challenges of the current health care system. Registered nurses (RNs) comprise the majority of the hospital workforce and provide most of the care to the patients (Simpson & Courtney, 2002). Therefore, a hospital's overall satisfaction is directly related to patient satisfaction. In the past, nursing was not concerned with the administrative aspects of health care (Ahmed et al., 2014). However, to ensure greater accountability in the face of complex changes in the health care system and high demands, nurses must improve their level of thinking and reasoning abilities (Luetz et al., 2010). Because nurses are constantly required to be accountable for the quality of care patients receive, they must use their critical thinking skills to guide effective quality improvement initiatives to improve nursing care.

Quality improvement is one of the areas in which critical thinking has gained popularity. Like critical thinking, quality improvement is a continuous process; hence there exists a mutual relationship between effective quality improvement initiatives and critical thinking (Cronenwett et al., 2007). Cronenwett et al. (2007) discussed quality improvement initiatives such as identification of clinical indicators in detecting problems and, implementation and evaluation actions which together with critical thinking skills encourage evidence-based activity from the nurses, safer care, improved decision-making, and diagnostic predictions in cases of FTR. Effective critical thinking skills improve the nurses' ability to identify clinical indicators, evaluate their significance, and identify areas which may require improvement (Robert & Petersen, 2013). Through the application of critical thinking skills to the technical and interpersonal aspects of their work, nurses are able to provide creative and effective personalized solutions to unpredictable patient conditions (Ahmed et al., 2014). Therefore, there is a need for all nurses to prepare for lifelong learning, improvement of critical thinking skills, and proper organization of patient information to provide solutions to complex problems. Effective clinical reasoning skills have a positive impact on patient outcomes (Aiken, Clarke, Cheung, Sloane, & Silber, 2003). Conversely, poor clinical reasoning skills often result in a failure to detect impending patient deterioration, thus, resulting in FTR (Aiken, Sloane, Lake, Sochalski, & Weber, 1999).

Use of Assessment Tools in Patient Care

Health service systems aim to improve the quality of health, both in the curative and rehabilitative aspects of health care (Rothman & Wagner, 2003). With evidence that primary care does contribute to patient outcomes, there is the need to put extra efforts in

evaluating the quality of care services delivery (McIlrath et al., 2010). As a result of the ever increasing burden of chronic illnesses, multiple approaches have been developed towards improving primary health care (McIlrath et al., 2010). Examples of primary care assessment tools include consumer-client surveys, facility surveys, provider surveys, and health system surveys which are useful in assessing the adequacy of primary care given to people both from the patient's and practitioner's perspective.

Faced with the growing demand to counter the shortage of family doctors in most countries, people have resorted to affordable providers like nurse practitioners in order to maintain the quality of care and reduce the cost of health care (Rothman & Wagner, 2003). In addition, care to chronically ill patients is provided amidst high demand, thus placing much pressure on nurses to perform rapid diagnosis and assessment of a patient in case of a deviation. Due to congestions in health care institutions, nurses spend limited time with each patient, hence increasing the likelihood that poor patient outcomes would occur as a result of FTR.

Nurse Education and Training in Patient Care

Quality and safety education is meant to equip the nurses with the necessary competencies for continuous improvement on the existing health care systems (Cronenwett et al., 2007). Education and training of nurses plays an important role in equipping them with safety skills which are vital for the improvement of patients' health (American Association of Colleges of Nursing [AACN], 2006). Therefore, nurses must be able to demonstrate that health care interventions indeed improve the quality of patient care, and also recommend interventions with the best patient outcomes. In addition, nurses must be able to observe, evaluate, and interpret the patient's conditions and make

clinical decisions and judgments quickly enough to prevent adverse patient events (Carroll, 2004).

Aspden, Corrigan, Wolcott, and Erickson (2004) argue that education and training are the most important strategies for improving patient safety in primary care. However, there is a lack of training of RNs in patient safety strategies such as event analysis, quality improvement methods, and human factors within primary care in the United States (Minick, 1995). A number of problems facing the safety and quality of the United States health care system have been raised by national commissions in the recent past (Saxe, Janson, Dennehy, & Stringari-Murray, 2007). Consequently, numerous reports from various committees suggest that for health care in the United States to improve, providers must be prepared and equipped with different sets of competencies from those developed in the current educational programs (Luetz et al., 2010). Therefore, health professionals using scientific evidence should have the capability to define good care, identify existing gaps, and be conversant with the initiatives necessary to close any gaps (Saxe et al., 2007). The 2003 Institute of Medicine (IOM) Health Professions Education report challenges the faculties of nursing, medicine, and all the health professionals to change the learning experiences that form the core of professional identity formation to ensure graduates are educated to provide patient-centered care while emphasizing evidence-based practice, informatics and quality improvement methods (Williams, 2000).

Saxe et al. (2007) emphasized the need for improved training for nurses within the CCM. Therefore, to prepare advanced practice nurses to provide quality care and effect change in the changing health care system, training and education must focus on clinical practices with patient-based, result oriented settings that employ the use of new

technology (Haas, Ann Swan & Haynes, 2013). It is also important to perform a root cause analysis to find the causes of errors in the system to ensure that future systemic problems are controlled and minimize FTR. Finally, health care institutions should equip nurses with the knowledge and practical skills to prevent FTR and ensure patient stability.

Theoretical Framework

Thompson (2010) described many practices that invest in patient safety, especially the concept of surveillance and rescue, which are directly influenced by the primary nurse. The most commonly used primary patient care model is the CCM. The CCM provides an additional perspective to primary care while acknowledging the paradigm shift from the existing system which waits for people to present their disease instead of dealing with the challenge of chronic care illnesses. This model underscores the need for support of health care institutions through provision of more resources and implementation of better policies to improve the management of chronic care (Rothman & Wagner, 2003). This section provides the theoretical framework and conceptual model of CCM and its application in the health care system to prevent FTR.

The Chronic Care Model

The CCM is meant to improve the management of chronic illnesses (DOH, 2003). Most of the institutions in the United States have successfully implemented the components of this model. Evidence exists that the CCM can both improve the quality of clinical care and reduce health care costs (Rothman & Wagner, 2003). However, for successful adoption of the model, conditions must be favorable to all the aspects that

affect health care institutions, the health care system, the community, and the health care institution (Muntinga, Jansen, Nijpels, Schellevis, & Van Leeuwen, 2015).

Bodenheimer, Wagner, and Grumbach (2002) discuss the challenges facing primary home care. Bodenheimer et al. argued that problems from outside the home setting coupled with structural flaws weaken homes from within. Therefore, the prospects of improving chronic care depends on favorable external conditions in the community, health care system, and the working environment in health care institutions (Griffiths & King's College London, 2008). Wagner, Pare-Blagoev, Clark, and Poldrack (2001) agreed with this concept and indicated that the increasing number of patients living with chronic illnesses face challenges with their medical conditions due to an incomprehensive health care system. Wagner et al. stressed the need for continuous communication with care providers, individualization of care, service-based evidence, and cooperation among nurses (Wagner et al., 2001).

Rothman and Wagner (2003) explained the role of primary care for patients with chronic medical conditions and underlined the need for a coordinated health system. Rothman and Wagner (2003) argued that an effective primary care system should be comprehensive, continuous, and coordinated. However, some chronic illnesses require more than one nurse, thus, coordination is key to achieving quality patient care (Rothman & Wagner, 2003). This model is helpful to nurses when comparing findings to gain more insight into a patient's condition because they are better equipped to remember and be vigilant while working to stabilize the patients.

Rationale for the Chronic Care Model.

The management of chronic illnesses is quickly developing into a major component of primary care (Dancer & Courtney, 2010). With the qualifications of Nurse Practitioners and RNs on chronic disease management, there is also an increased need for additional skills in primary care settings (Rothman & Wagner, 2003). The CCM is made up of six concepts which are also referred to as modifiable components of health delivery (Fireman, Bartlett, & Selby, 2004). The concepts include organizational support, clinical information systems, delivery system design, decision support, self-management support, and community resources.

Organizational support. Organizational support concept addresses the cultural aspects of the nursing practice as well as the leadership system (Fireman et al., 2004). The provision of patient care has a culture where the management of chronic illnesses and improvement of the practice are core values (Griffiths & King's College London, 2008). In addition, leadership in the nursing practice is committed to improving patient care and adhering to evidence-based practice (Muntinga et al., 2015). Therefore, health care facilities should create a conducive working environment and culture to ensure that nurses work optimally to prevent adverse patient events.

Clinical information systems. CISs are comprised of structures meant to organize patients and the community, provide information for the purpose of describing the health of the population, and to facilitate the provision of quality care (Griffiths & King's College London, 2008). A good CIS should provide individual patient information, health care provider performance, and include a disease registry which can identify the population (Muntinga et al., 2015). With regard to the reduction of adverse

patient events, health care institutions should adopt innovative clinical technologies that provide nurses with a reliable registry of chronically ill patients to improve monitoring of patients and reduce adverse patient events.

Delivery system design. Delivery system design concept addresses the components of follow-up care, the organization of follow-up visits, and the roles of the practice teams (Griffiths & King's College London, 2008). It involves planned patient interactions, case management, and teamwork to ensure the provision of quality clinical care (Muntinga et al., 2015). The CCM adopts various innovative delivery systems methods like extensive use of team members and group visits which should be employed in practice improvement programs (Karson et al., 2005). Although maximizing the use of all team members is important to the system design, some patients perceive the presence of an additional caregiver as an indication of deterioration in their health (Safran, 2005). In an effort to reduce adverse patient events, health care institutions should allow planned visits, case managements, and teamwork to enhance patient outcomes.

Evidence-based practice. Evidence-based practice comprises of a set of guidelines that provides standards for care which should be applied in practice by the nurse on a daily basis (Safran, 2005). It entails making decisions on better ways to improve health care by integration of the most suitable evidence available with expertise and other resources (Bodenheimer et al., 2006). Implementation of evidence-based practice is usually done in a compatible manner with consideration of both organizational and environmental aspects to ensure quality care is provided. To address adverse patient events, nurses should employ the latest evidence-based guidelines and continue learning the standards for each chronic condition.

Decision support. Decision support involves the mechanisms created for the purpose of increasing provider access to EBP guidelines (Feifer et al., 2001). Several studies approve the effectiveness of various decision support tools for the improvement of health care delivery (Shea, DuMouchel & Bahamonde, 1996; Sequist, Gandhi, Karson et al., 2005; Feifer et al., 2001). Health care institutions should employ proven education methods, consult experts, and use evidence-based guidelines to ensure that comprehensive clinical decisions are made to prevent adverse patient events. Therefore, nursing staff should be familiar with patient conditions that require consultation from other clinical staff to prevent delays that may cause FTR.

Self-management support. Self-management support concept emphasizes the importance of patient-centered interventions. Such interventions include training nurses, cooperation between care providers and patients to provide solutions, psychological support, and use of adapted education resources (Muntinga et al., 2015). The main aim of self-management support is to prepare patients and empower them on effective ways of managing their own health. Bodenheimer et al. (2006) suggested that the development of self-management skills can have a positive impact on the health outcomes of patients with chronic illnesses. Some of the self-management skills include problem-solving, decision-making, resource utilization, and action skills (Griffiths & King's College London, 2008). To effectively reduce adverse patient events, patients should also learn to manage their health and inform nurses of any discomfort they develop to ensure proper assessment is conducted.

Community resources. The CCM model underlines the importance of networking with the community for support, coordination and development of

community-based interventions for the purpose of improving health care (Muntinga et al., 2015). These partnerships are very important for areas with an underrepresented population with low incomes. Health care facilities should liaise with the community to ensure that adequate resources are invested into primary care facilities, recruitment of more nurses, and new innovations that improve nurses' ability to detect abnormalities in chronically ill patients early and prevent adverse patient events. Figure 1 below is a conceptual framework of the CCM in relation to this study.

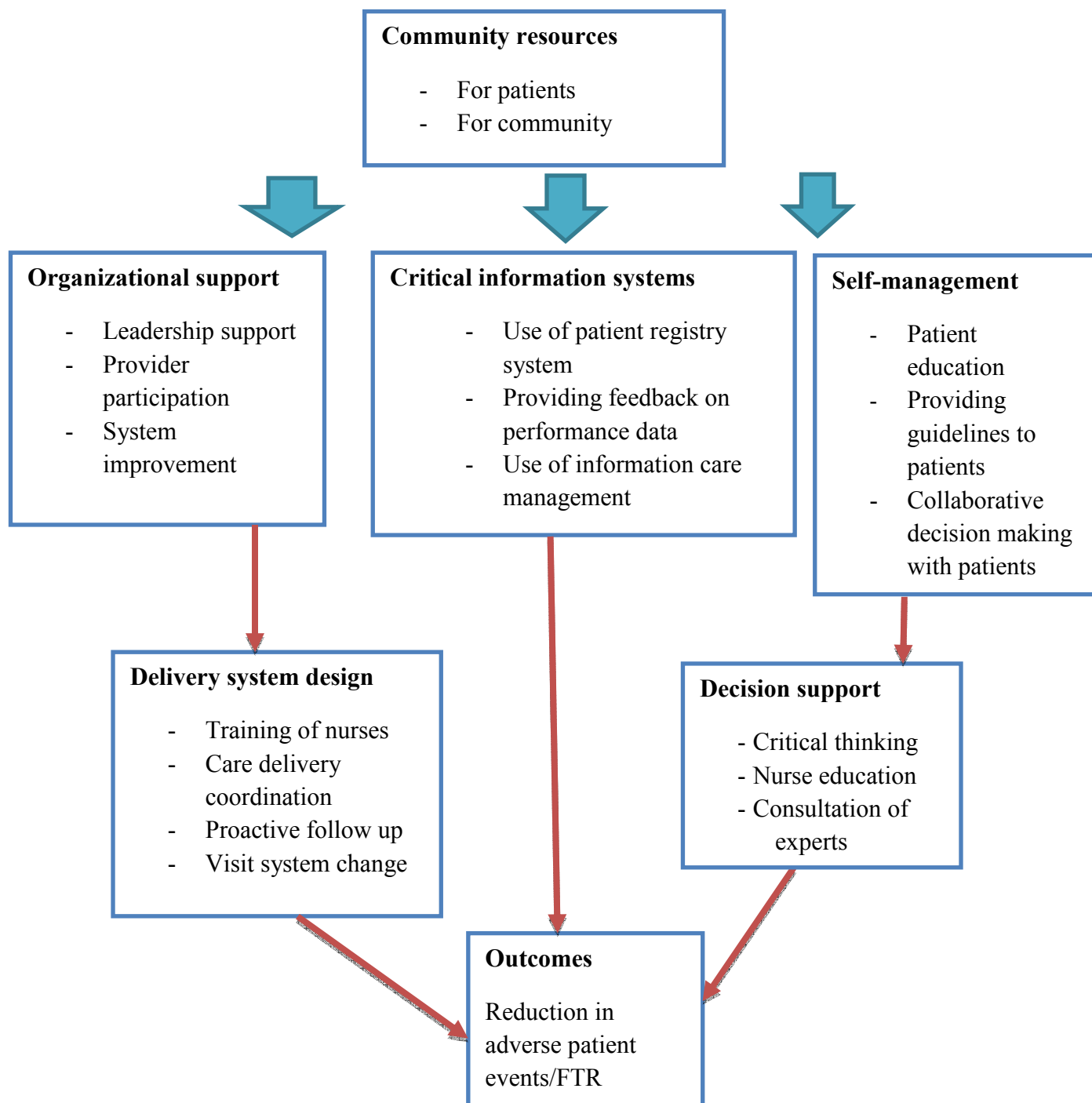


Figure 1. Conceptual framework of CCM

Summary

In the specific literature, I addressed the issue of FTR and supports that hospital administrators should maintain diligence in implementing programs/processes to enable nurses and care providers to respond efficiently to patients whose conditions are deteriorating. The DNP project not only required implementation but also long-term follow-up and continued education/training on the problem. In addition, evidence-based models can help nurses to recognize changes in patients' statuses earlier and ensure early intervention. FTR is still a concern in many acute care settings. A variety of early recognition tools and early warning processes have been implemented in response to cases of FTR. Educating nursing staff is a stage of implementing any process, model, or early recognition tools, therefore, requires conscientious follow-up and documentation to ensure the education is effective. Evidence-based concepts and conceptual frameworks and processes are necessary to ensure process outcomes are maximized, and cases of FTR are minimized.

Section 3: Project Design Methods/Approach

Introduction

In this chapter, I describe the methods that I employed to evaluate the effectiveness of the educational medical-surgical intervention, and the development of post competency evaluations. The objectives of this study included determining (a) how a comprehensive medical-surgical competency plan on assessment increases a nurse's ability to recognize early signs of a patient who is clinically deteriorating; (b) whether a comprehensive medical-surgical competency plan increases a nurse's ability to think critically and intervene appropriately; and (c) whether the posttest results confirm a nurse's grasp of definitive criteria indicating a patient's declining status, her/his understanding of how and when to notify the RRT, and the ability to recognize unforeseen variables that have contributed to inadequate assessment and may have led to FTR. In this chapter, I also focus on the project design and method, data collection tools and procedures, sampling techniques, and data analysis methods the project leader employed to execute the improvement initiative.

Project Design and Method

I employed a pretest and posttest design to assess the effectiveness of learning modules on clinical staffs' critical thinking and vigilance in the procedures meant to reduce the risks of FTR. A pretest-posttest design involves testing a group of participants on a dependent variable before and after manipulation of the independent variable (Instructional Assessment Resources [IAR], 2011). A single group experiment is composed of pretests and posttests, which are administered to one group to measure the

effectiveness of interventions such as instructional activity, innovations, or programs (IAR, 2011). A *pretest* refers to the process of measuring knowledge prior to the implementation of an instructional activity, innovation or program (Delucchi, 2007). A *posttest* refers to the evaluation of individuals after a period of instruction to determine what they have learned (Delucchi, 2007). I chose the pretest and posttest assessment for the DNP project because it allowed for the evaluation of the nurses growth and the skills they gained after the instructional period (Roediger III, Putnam, & Smith, 2011).

Nursing staff participated in a pretest to evaluate their baseline knowledge on medical-surgical interventions and provision of care to chronically ill patients. I then administered modules/sessions to all staff during a 2-day period (see Appendix B). There were no exclusion criteria or specifications on experience level. Mandatory education sessions were strategically scheduled to capture all nursing faculty including nursing assistants. The intervention included education on (a) patient assessment, (b) mock code blue review, (c) review procedures, (d) professional development regarding advocacy for the patient and empowerment, (e) clinical content, and (f) hospital sepsis protocol (Appendix B). I administered post competency tests to the nursing staff for approximately 10 to 15 minutes after the modules to determine the efficacy of the medical-surgical competency education sessions.

Population and Sampling

The quality improvement project targeted nursing staff from three departments of a VA Hospital who were provided with pretests, education modules, and posttests, respectively, with the aim of evaluating the effectiveness of the education intervention. The years of experience of the participants ranged from 1 year to 25 years, and the ages

of the participants ranged from 22 to 64 years. The clinical staff in the facility was composed of 50% Caucasians, 45% Hispanics, and 5% African-Americans. The staff mix provided me with different perspectives from the clinical staff because of the difference in the level of education and experience, thus improving the reliability of the project (Hlebec, Kogovsek, & Coenders, 2012). I collected data for analysis purposes in three medical-surgical inpatient units at a VA Hospital.

Data Collection

The data collection process involved four main steps. The first step involved the participants completing a demographic survey and then taking the pretest. I administered the pretest to the nursing staff to examine the nurses' existing knowledge on the triad assessment tool, FTR, RRT processes, and surveillance of chronically ill patients. The second step involved the provision of education modules on the triad of assessment tool and accompanying process of surveillance, early recognition, vigilance, and rescue, including how to use the RRT system. I educated the participants for two days in a room provided by the hospital. In the third step, I approached the participants 10 to 15 minutes after the education modules and provided them with a posttest, which was meant to gauge the effectiveness of the educational intervention. The fourth step involved using the evaluation survey to determine how well the staff performed as a group after the educational intervention.

Instruments

I used three different instruments to collect information in this project: demographic form, the pretest questionnaire, and evaluation survey. I used the demographic form to capture the staff's name, certification, the level of experience,

gender, and education level. The pretest consisted of open-ended questions relating to the six modules offered to the nursing staff. I used the pretest to test the nurses' baseline knowledge on how the components of the Triad relate to patients' conditions (Module 1), surveillance, early recognition and vigilance (Module 2), Oxy-Heme Dissociation Curve and oxygen saturation (Module 3), Orthostatic Blood Pressure and Mean Arterial Pressure (MAP) (Module 4), SEPSIS (Module 5), and pneumonia (Module 6). I administered the same pretest to the nurses after the modules as the posttest. The evaluation survey tested the staff's performance as a group after the educational intervention (Appendix B). The evaluation survey had 8 questions, 6 for RN and LPN staff, and 2 questions for the Nursing aide staff. The instrument has a scoring scale ranging from 1(Absolutely Disagree) to 5(Absolutely Agree). The instruments used in the DNP project do not have Cronbach's alpha.

Protection of Human Subjects

I sought consent from the Institutional Review Board of Walden University before engaging the participants. I also informed the participants on the purpose of the project initiative and assured them of the confidentiality of their personal information. To protect the privacy of the nursing staff, pre and post competency test results were viewed only by the unit nurse educators, project leader, three nurse managers from post-surgical, medical, and step-down nursing units, and the Director of Nursing (DON). After collection, I stored the data safely in my locked file cabinet and password-protected computer files.

Data Analysis

I conducted data analysis to address the projects' questions by comparing the pretest and posttest scores of each participant. I used a t-test to compare the mean scores of the participants. This was useful in evaluating staff performance and creating a medical-surgical competency plan.

The first project question (PQ) was: Will a comprehensive medical-surgical competency plan on assessment increase a nurse's ability to recognize early signs of a patient who is clinically deteriorating? To address this PQ, I used the results of the posttest to determine whether a comprehensive medical-surgical competency plan can increase a nurse's ability to recognize early signs of clinical deterioration. If the nurses showed a low level of competence in recognizing early signs of deteriorating patient's conditions, then there would be a need for a medical-surgical competency plan to aid in the identification of early signs.

The second PQ was: Will a comprehensive medical-surgical competency plan increase a nurse's ability to think critically and intervene appropriately? To address this PQ, I analyzed the results of the posttest to determine whether nurses were able to think critically and intervene appropriately. If the majority of the nurses were able to apply the knowledge they received through the education modules, then a medical-surgical competency plan would be necessary to enhance nurses' critical thinking skills and readiness to provide critical care to their patients. If the nursing staff registered significantly higher posttest scores compared to the pretest scores, then they benefited from the education modules.

The final PQ was, Will the posttest results confirm a nurse's (a) grasp of definitive criteria indicating a patient's declining status, (b) understanding of how and

when to notify the RRT, and (c) ability to recognize unforeseen variables which have contributed to inadequate assessment and may have led to FTR? To address this PQ, I analyzed the posttest to determine nurses' grasp of definitive criteria indicating a patient's declining status, understanding of how and when to notify the RRT, and ability to recognize unforeseen variables which contribute to inadequate assessment. The participants' ability to apply what they learned from the modules was evident in the answers they provided in the posttest. After comparing the answers, the project leader awarded scores to each staff using a scale of 1-5 (1 = Absolutely Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Absolutely Agree). The analysis of the posttest results was carried out by comparing the pretest and posttest scores for each staff to determine the amount of knowledge the nurses gained from the education intervention (modules).

Project Evaluation Plan

I evaluated this DNP project using an evaluation survey (Appendix C) which uses a 5-point Likert scale with 1 representing "Absolutely Disagree" and 5 representing "Absolutely Agree". I used the evaluation survey to determine how well the staff did as a group after the educational intervention. The survey has 2 sections, the first section has 6 evaluation questions for RN and LPN staff, and the second section has 2 evaluation questions for the Nursing aide staff. I analyzed data from the evaluation survey to determine whether the education intervention had a significant effect on nurses' critical thinking skills and ability to prevent adverse patient events.

Summary

In this project, I employed a posttest design to assess the effectiveness of an educational intervention on clinical staff's critical thinking and vigilance in the

procedures that are meant to reduce the risks of FTR. I collected data for analysis purposes in three inpatient medical-surgical inpatient units at a VA Hospital. I also performed a needs assessment, posttests for each module to assess how well the staff performed as a group after the educational intervention. I also observed ethics relating to the protection of rights of human subjects in undertaking the project. Finally, I evaluated this DNP project using an evaluation survey which uses a 5-point Likert scale.

Section 4: Findings, Discussion, and Implications

Introduction

In Section 4, I describe the results of the pretest and posttest questionnaires that were aimed at testing the effectiveness of the quality improvement intervention. I also provide arguments for the central concepts and findings that arose from this DNP project. The target population for this quality improvement project was RNs, LPNs, and nurse's aide staff, who were enrolled in a medical-surgical unit in the VA Hospital. As indicated in Table 1, the highest number of participants who took part in the educational program included 29 in Module 6, whereas the lowest turnout was experienced in Module 4 (22) and Module 5 (22). I used descriptive statistics and percentages to present the results of the pretest and posttest scores. In this section, I also provide the summary and evaluation of the findings of the DNP project, the results discussion in the context of the literature and conceptual model, implications for practice, implications for social change, project strengths and limitations, recommendations for remediation of limitations, analysis of self, and a summary.

Summary and Evaluation of Findings

The aim of the practice initiative was to address the following practice focused questions (PFQs):

1. Will a comprehensive medical-surgical competency plan on assessment increase a nurse's ability to recognize early signs of a patient who is clinically deteriorating?'

2. Will a comprehensive medical-surgical competency plan increase a nurse's ability to think critically and intervene appropriately?
3. Will the posttest results confirm a nurse's (a) grasp of definitive criteria indicating a patient's declining status, (b) understanding of how and when to notify the RRT, and (c) ability to recognize unforeseen variables which have contributed to inadequate assessment and may have led to FTR?

I administered the pretests and posttests to nursing staff before and after receiving six educational modules with the aim of addressing the three PFQs. Data analysis involved the pairing of each participant's average scores based on the pretests and posttests. I anticipated that higher posttest scores would suggest that the nursing staff benefitted from the educational modules. Because the pretests and posttests were performed immediately before and after the educational intervention respectively, all the nursing staff who participated in the educational modules completed both the pretests and posttests questionnaires. The pretest and posttest scores' distribution is illustrated in Table 1.

Table 1

Average Scores for Pretests and Posttests Scores for RNs and LPNs

Module	N	Pretest	Posttest
1. Components of the triad of assessment	27	2	4
2. Surveillance, early recognition, vigilance competency	26	3	5
3. Oxyhemoglobin dissociation curve	23	3	5
4. Orthostatic blood pressure and mean arterial pressure	22	3	5
5. Sepsis	22	2	4
6. Pneumonia	29	3	5
Total average score		2.3	4.7

The scores on the pretests for the six modules ranged from 2 to 3 points with a total average score of 2.3 points. The scores on the posttests ranged from 4 to 5 points with a total average of 4.7 points. Regarding knowledge of how the triad of assessment components related to patients' conditions (Module 1) and sepsis (Module 5), the participants' registered average scores of 2 points in the pretest and 4 points in the posttest. Similarly, participants recorded average scores of 3 points in the pretests and 5 points in the posttests in Module 2 (surveillance, early recognition, and vigilance), Module 3 (oxy-hemoglobin dissociation curve and oxygen saturation), Module 4 (orthostatic blood pressure and mean arterial pressure), and Module 6 (pneumonia).

Project question 1: Will a comprehensive medical-surgical competency plan on assessment increase a nurse's ability to recognize early signs of a patient who is clinically deteriorating?

This project question was addressed by comparing the nursing staff's scores on the pretests and posttests regarding Module 1 and Module 2. Questions regarding Module 1 were mainly aimed at assessing improvement in nursing staff's knowledge concerning the components of the triad of assessment which included physical assessment, vital signs, and laboratory values. In addition, Module 1 was aimed at equipping the nursing staff with knowledge of how the components of the triad of assessment model could be applied when assessing patients' conditions. The average scores on the pretests (2 points) and posttests (4 points) for Module 1 indicated an improvement in the nursing staff's knowledge regarding the components of the triad of assessment model after the educational modules. Improvement of knowledge of nursing staff regarding the

components of the Triad will increase their ability to recognize deteriorating patients' conditions, and thereby minimize the likelihood of FTR.

The second educational Module (Module 2) was aimed at testing the nursing staff's competency regarding surveillance, early recognition, and vigilance. Module 2 consisted of lessons regarding the processes of data collection, interpretation, and synthesis which are critical for clinical decision-making. The nursing staff was also educated on the significance of early recognition in reducing FTR and improving patient outcomes. Module 2 was also aimed at providing the nursing staff with the operations that they should avoid to minimize the risk of FTR. The average scores on the pretests and posttests for Module 2 were 3 points and 5 points respectively. Comparison between the scores on the pretests and posttests indicated an increase in the nurse's ability to recognize early signs of a patient who is clinically deteriorating.

Project Question 2: Will a comprehensive medical-surgical competency plan increase a nurse's ability to think critically and intervene appropriately?

The purpose of Module 3 was to improve the nursing staff's knowledge regarding the oxyhemoglobin dissociation curve, which measures the affinity of oxygen to bind with hemoglobin. The questions were used to test the nursing staff's abilities to use knowledge of the Oxyhemoglobin Dissociation curve to identify the initial stages of hypoxia, which may result in FTR. The average scores on the pretests and posttests were 3 points and 5 points respectively.

The goal of using Module 4 was to improve the nursing staff's knowledge regarding orthostatic blood pressure and mean arterial pressure (MAP). After completing Module 4, it was expected that the nursing staff would be able to define orthostatic

hypotension and the psychological occurrences that accompany the disorder. In addition, the nursing staff was expected to be able to explain why orthostatic hypotension occurs, the conditions that may cause orthostatic hypotension and the complications that are linked with being orthostatic. Based on the results of this project, the nursing staff registered average scores on the pretests and posttests of 3 points and 5 points respectively. The increase in points implies that the medical surgical-plan increased the nursing staff's knowledge of orthostatic blood pressure, and their ability to detect symptoms and signs of orthostatic blood pressure and the conditions that may lead to orthostatic hypotension.

The goal of using Module 5 was to improve knowledge of sepsis, severe sepsis, and septic shock among the nursing staff. After completing Module 5, I expected the nursing staff to improve their skills in identification of the signs and symptoms of Systemic Inflammatory Response Syndrome (SIRS) criteria using the triad of assessment model. In addition, I expected the nursing staff to understand the role of MAP. The scores on the pretests and posttests for Module 5 were 2 points and 4 points respectively. The increase in points indicates an improvement in the nurses' ability to identify symptoms and signs of sepsis among the patients, and use clinical knowledge to intervene appropriately.

The purpose of Module 6 was to improve the nursing staff's knowledge regarding pneumonia, its complications, and the nursing and medical interventions that are used in the care of patients with pneumonia. Knowledge on pneumonia was expected to improve the nurses' ability to detect symptoms and signs of SIRS Criteria using the Triad format and the three key nursing interventions that can be utilized in the care of patients with

pneumonia. The average scores on the pretests and posttests for Module 6 were 3 points and 5 points respectively, therefore, noting an improvement in the nurses' ability to identify signs and symptoms of pneumonia and use their critical thinking skills to intervene appropriately. Overall, these findings indicate an improvement of nursing staff's ability to think critically and intervene appropriately when patients' conditions deteriorate.

Project Question 3: Will the posttest results confirm a nurse's (a) grasp of definitive criteria indicating a patient's declining status, (b) understanding of how and when to notify the RRT, and (c) ability to recognize unforeseen variables which have contributed to inadequate assessment and may have led to FTR?

Project question three was addressed by comparing the scores on the pretests and posttests of all of the six educational modules. The average score for the pretests for all the six modules was 2.3 points out of 5 points while the average score for all the posttest scores was 4.7 points. The increase in average scores indicates that the medical-surgical competency plan improved the nursing staff's grasp of definitive criteria that are used to indicate patients' deteriorating statuses, understanding when to notify RRT, and identifying hidden variables that may lead to FTR.

After completion of the educational intervention, I assigned scores for all the participants based on a Likert scale rating ranging from 1 (Absolutely Disagree) to 5 (Absolutely Agree). The results of the initiative assessment survey of the RNs and LPNs participating in the educational intervention are provided in Table 2. The purpose of the assessment survey was to test how the staff performed as a group after the educational intervention.

Table 2

Average Scores of Posttests for RNs and LPNs

Module	N	Average score
1. Components of the triad of assessment	27	4.6
2. surveillance, early recognition, vigilance competency	26	4.7
3. Oxyhemoglobin dissociation curve	23	4.6
4. Orthostatic blood pressure and mean arterial pressure	22	4.6
5. Sepsis	22	4.6
6. Pneumonia	29	4.8

The Nurse's aides staff did not participate in the educational modules. However, they were provided with modules on Pulse Oximetry and Orthostatic hypotension. The results of the posttest for the modules are provided in Table 3. The results indicate that the nurse's aides staff significantly increased their knowledge of Pulse Oximetry and Orthostatic hypotension after receiving the educational modules.

Table 3

Average Scores of Posttests for Nurse's Aides

Module	N	Average score
Pulse Oximetry	5	4.6
Orthostatic hypotension	5	4.6

After the educational intervention, I assigned scores to the nursing staff based on how well they performed as a group after the educational intervention. The Likert scale ranged from 1 (Absolutely Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Absolutely Agree). It was found that the highest collective average score for the nursing

staff (4.8) regarding questions about pneumonia (Module 6), followed by knowledge of surveillance, early recognition, and vigilance competency (4.7) (Module 2). The staff received scores of 4.6 points regarding knowledge of the components of the triad model (Module 1), Oxy-hemoglobin dissociation curve (Module 3), Orthostatic Blood Pressure and Mean Arterial Pressure (Module 4), and Sepsis (Module 5). Finally, the nurse aide staff who were provided with modules on Pulse Oximetry and Orthostatic hypotension ($N=5$) attained average scores of 4.6 points for both modules (Table 3). Overall, the findings of the project initiative indicated that the educational program improved the nursing staff's knowledge regarding the medical-surgical competencies.

Discussion of Findings in the Context of Literature and Frameworks

Identification of patients' deteriorating conditions is sometimes a complex and challenging task for nursing staff in acute care settings. Early identification of a patient's symptoms before he/she deteriorates is key to ensuring patient safety and improved patient outcomes (Griffith et al., 2008). According to Bell-Gordon, Gigliotti, and Mitchell (2014), there is an increasing negligence towards the indicators of deteriorating patient conditions in the acute care setting. Past literature suggests that the adoption of new interventions, such as the medical-surgical competency plan described in this project, can reduce FTR rates and improve the quality of care provided to acute care patients (Wakeam et al., 2014).

The results of the scores on the pretests and posttests of the competency plan indicated an improvement in medical-surgical competencies and critical thinking skills among nursing staff in the VA Hospital. Aiken et al. (2003) argued that effective clinical reasoning skills are vital in achieving positive patient outcomes. Conversely, poor clinical

reasoning skills often result in poor detection of patients' deteriorating health conditions, thus, resulting in FTR (Aiken et al., 2003). Therefore, adoption of interventions such as the triad of assessment model used in the DNP project can facilitate effective thinking and reasoning skills among nurses in acute care settings. Using the triad of assessment model and other similar models, health care institutions can reduce FTR rates, and thereby improve patient satisfaction and health outcomes among critically ill patients (Lunney, 2013). Furthermore, the triad of assessment tool can be disseminated and utilized in the education of nurses and other settings for assessment of patients, performing interventions, and evaluating health outcomes.

The DNP project was a quality improvement initiative that can improve the nursing staff's medical-surgical competencies regarding the components of the triad of assessment model. Regarding improvement of knowledge and critical thinking skills, the results of the posttest scores were encouraging. The improvement in the posttest scores was likely as a result of the educational intervention, which highlights the importance of continuous education and training of nurses on various medical-surgical plans to improve the quality of care. In addition, I concluded that the nursing staff exhibited a high level of improvement in critical thinking skills and medical-surgical competencies after receiving the educational intervention. There is a significant amount of empirical evidence supporting the effectiveness of educational interventions in improving nurses' knowledge and skills for improving patient outcomes in various health care settings (Lunney, 2013; Oja, 2011).

The high posttest scores exhibited in the DNP project indicated the excellent application of the knowledge on triad of assessment, surveillance, early recognition, and

vigilance gained from the six educational modules provided to the nursing staff.

According to Kane, Shamliyan, Mueller, Duval, & Wilt (2007), the presence of nurses at the patients' bedside implies that nurses should be empowered and given ownership of care quality provided to the patients. As indicated in this project, education and training of nurses led to improved nurses' knowledge of medical-surgical competencies and critical thinking skills. Therefore, adoption of innovations in health care education may improve nurses' performance in acute care settings. In the current health care system, it is vital to ensure proper education and training of nurses to maximize reimbursements from the CMS (Hain & Fleck, 2014).

The participants in this DNP project exhibited improved knowledge on the six modules, and the response rate indicated nursing staff's initiative to take responsibility for improving their medical-surgical competencies and critical skills. However, the most important implication of the findings of this project is the benefits of developing a medical-surgical competency plan to ensure the continuous education of nursing staff on evidence-based practices that can minimize the frequency of FTR situations. Various researchers have studied the effectiveness and importance of educational interventions on improving nurses' practice and critical thinking skills (Tschannen, Aebbersold, McLaughlin, Bowen, & Fairchild, 2012; Lunney, 2013; Oja, 2011). Tschannen et al. (2012) found that education of nurses through simulation enhanced nursing students' practice skills. Tschannen et al. (2012) argued that nursing students who were educated on patient safety, priority setting, and conflict management using Capacity to Rescue Instrument (CRI) were able to transfer the knowledge gained in class compared to nursing students who did not participate in the simulations. Therefore, it is important to

introduce new educational interventions that are aimed at improving nurses' critical skills including conflict management, communication, and priority setting (Tschannen et al., 2012).

The findings of the DNP project indicate that the nursing staff benefited from the educational modules. Therefore, health care institutions should prioritize education and training of nurses on medical-surgical competencies to improve early recognition of clinical deterioration of the patient's health conditions and reduce FTR rates. Based on the findings of the project, the participants' improved knowledge on patient monitoring, vigilance, and surveillance is evident. The CCM model provided a framework for the implementation of the medical-surgical competency plan as the triad of assessment. According to DOH (2003), the CCM can be used to improve the quality of care to acute care patients through improved vigilance, surveillance, and monitoring of patients. The findings of the DNP project indicated that educational interventions can be used effectively in cooperation with the CCM. The findings are consistent with previous literature on the impacts of nurse training and education in improving early recognition of clinical deterioration of patients' health conditions. Overall, the educational initiative was successful in improving patient monitoring and clinical thinking skills in the provision of care for chronically ill patients.

Implications

Implications for Policy Change

The DNP project was a quality improvement initiative for improving nurses' critical thinking skills and medical-surgical competencies. The effectiveness of the triad of assessment model implies that health care institutions and policy makers should

develop educational interventions for improving nurses' medical-surgical competencies and critical thinking skills. The findings of the project imply that every educational intervention should be measured based on outcomes. Despite being experts in acute care, nursing staff can effectively cooperate with other health care organizations in adopting educational interventions such as the triad of assessment model nationwide. However, the interventions should be based on recent evidence-based guidelines and empirical evidence relating to FTR that all health care institutions can access. In addition, educational policies that are aimed at interventions for reducing FTR rates through education of nursing students could also be implemented.

The CMS uses quality improvement as criteria for reimbursement of health care institutions. Therefore, health care administrators should improve the quality of care, especially for acute care patients to reduce the financial burden on their institutions. Implementation of the medical-surgical plan to other medical units in the VA Hospital will also facilitate effective rescue of patients with severe complications and allow nurses to make timely interventions whenever patients' conditions start to deteriorate.

Practice Implications

Training of nurses on medical-surgical competencies enhances nurses' abilities to recognize complications, and improves their critical thinking, communication, and teamwork skills. Therefore, bedside nurses need to be empowered to take the initiative whenever they recognize deterioration in a patient's condition. Through this project, I indicated that the introduction of new educational interventions in health care, such as the triad of assessment model, can enhance nurses' critical thinking skills and medical-surgical competencies, thus, reducing the cases of FTR. In addition, effective educational

interventions can be used to improve care quality in acute care settings through early recognition of patients' deteriorating conditions, which reduces the likelihood of complications, morbidity, mortality, and FTR. Further, education and training of nursing staff using the medical-surgical competency plan can improve their clinical skills and simplify the nurses' tasks, while providing care for acute care patients due to improved clinical decision-making ability. As a result, nurses can effectively prevent complications from developing into FTR.

Research Implications

Based on the findings of the DNP project, improvement of nurses' critical thinking skills and medical-surgical competencies is key to reducing the rate of FTR and FTR-related mortality. Nursing staff can employ data collection and research skills to address future health cases in acute care settings. Using current evidence-based practice data, nursing staff can play a significant role ensuring continuity of research on the best educational interventions for improving nurses' competencies and skills. However, there is a need for further research in risk reduction in acute care settings. There is also a need for research on more accurate indicators of FTR that can accurately verify deterioration in patients' conditions. Finally, further research is needed on the impacts of applying the triad of assessment model on acute care patients.

Social Change Implications

This quality improvement initiative contributes to social change through identification of an educational program that facilitated improvement in the acute care nursing staff's medical-surgical competencies and critical thinking skills in a VA clinic. The implementation of the medical-surgical plan will facilitate early recognition of

patients' deteriorating conditions, therefore, prompt intervention by the medical doctors. The timely intervention will lead to improvement in patient outcomes, patient satisfaction, and increased trust between medical doctors and nurses in the VA Hospital. There has also been a culture change in the medical-surgical unit after implementation of the medical surgical plan. As the education intervention proceeded, unit nurses and nurse technicians began to increase engagement during the teaching sessions. The nursing staff's confidence seemed to be increasing as they were given encouragement to participate. This increased confidence could lead to assurance in advocating more for their patients in times of patient decline. The nursing staff expressed appreciation for the competency plan and articulated their desire for more education. It seemed the nursing staff could finally realize a dedicated intervention that was on their behalf and an indication they were valued. The quality improvement initiative can also help acute care nurses increase their participation in effecting change in care provision to chronically ill patients by having the confidence to notify the physician more readily when a patients' status is declining. Educators for medical-surgical units could use the components of the triad of assessment to evaluate their nursing staff's educational needs and assess their medical-surgical competencies regarding care for patients with chronic illnesses.

Project Strengths and Limitations

Strengths

One of the strengths of the DNP project was the use of pretests to evaluate the nurses' baseline knowledge on early recognition, vigilance, and monitoring of acute care patients. The pretests facilitated identification of knowledge gaps in the provision of care to acute care patients and allowed for a more planned presentation of the educational

modules to the participants (Wludyka, 2011). The execution of the DNP project within the scheduled timeframe also facilitated recruitment of participants. Another strength is that participants had a strong desire to improve their education and critical thinking skills, and involve other staff in achieving goals as a team. In addition, the gradual receptiveness of the education modules by the participants increased the participation from the nurses and nursing technicians. As a result, the nursing staff interacted freely with patients and in the process gained knowledge on the application of the triad of assessment model to each competency and personal experience to the educational modules. The final strength of the DNP was the successful implementation of medical-surgical competency plan.

Limitations

The DNP project had various limitations. In this DNP project, I used a small convenience sample on one acute care unit, thus possibly exposing the findings to selection bias (Wludyka, 2011). Also, the use of a small sample size reduced the generalizability of the results of the project. The use of a finite number of modules also limited the scope of the project. The use of multiple modules would have facilitated a more comprehensive assessment of the participants' knowledge and skills. The use of group education also forced the student to use one teaching method for all the participants. The use of individual education would have facilitated more flexibility and retention among each of the nursing staff.

Recommendations for Remediation of Limitations in Future Work

A possible improvement practice initiative would be the use of a larger sample size in order to reduce the likelihood of bias and improve the reliability of the project (Wludyka, 2011). The use of a finite number of modules also limited the scope of the

project. The use of multiple modules would have facilitated a more comprehensive assessment of the participants' knowledge and skills. By the use of group education, the student was forced to use one teaching method for all the participants. The use of individual education would have facilitated more flexibility and retention among each of the nursing staff.

I will adopt various strategies for remediating the limitations of this project. First, all bedside nurses will be included during the next stage of implementation. The main focus of this quality improvement initiative was nursing staff. During the implementation of this project, all other practitioners including physiotherapists, dieticians, and physicians will be involved. Further, to improve the effectiveness of medical-surgical concepts among nursing staff, all the care practices must be centered on the patients.

Analysis of Self

As a Scholar

As a scholar, my academic journey has been challenging, especially during the transition from a student to a scholar. The biggest challenges faced by the student have been balancing between school, family, and work. However, the student has learned important lessons on perseverance and maintaining focus in every academic involvement. In this project, I focused on identifying a local problem that needs attention in a local health care institution. I also got the opportunity to showcase advanced scholarly skills and knowledge through education of nursing staff on medical-surgical competencies and critical thinking skills. As a scholar, I searched for literature and performed a thorough appraisal of literature to provide empirical support for the educational intervention. I also conducted a comprehensive literature review that facilitated the identification of gaps in

practice and other alternative interventions that can be used to prevent FTR. Finally, I designed the questionnaire, which was an important tool in the evaluation of the educational intervention.

Practitioner

Throughout the DNP project, I followed the AACN (2006) DNP essentials and my transformation as a leader was demonstrated. I also increased the ability to conceptualize new care delivery models based on contemporary nursing science was evident. In addition, care delivery models, which are feasible within the cultural, political, organizational, and economic perspective of the current health care system, were considered. Currently, the AACN (2006) believe that the doctoral level of education essentially prepares nurses for the highest leadership responsibilities in nursing practice and scientific research. Therefore, in conducting the project, I gained significant personal development as a scholar, a practitioner, and a professional in the nursing field.

Project Developer

Through this project, I gained adequate skills and knowledge for advanced nursing practice through understanding the conceptual basis of the triad of assessment model. The development of the quality improvement initiative involved a thorough search and review of relevant current literature pertaining FTR and the use of educational interventions in acute care settings to improve care for chronically ill patients. Using the CCM as a framework, the student utilized evidence-based guidelines to develop the educational intervention. The experience of developing and implementing the educational program enhanced the student's ability to develop educational modules that can be used to improve nurses' knowledge and skills in future.

Professional

As a professional, I gained extensive knowledge and experience from the quality improvement initiative. During the implementation of the medical-surgical plan, I demonstrated high professionalism by ensuring only relevant data was collected and in an ethical manner. The most valuable skill and knowledge I gained from the quality improvement initiative is effective project development that is essential in becoming an expert professional. As a professional, I effectively collaborated with the IRB committee, nursing staff, supervisor, and other stakeholders at the VA Hospital to implement the project successfully. During the entire duration of the project, I gained adequate scholarly, leadership, practitioner, and project development skills that will be useful in my future professional career.

Summary and Conclusions

In terms of care provision, nurses are well prepared and trained to perform in various health environments. With the constant changes in the healthcare system, provision of nursing care has also evolved. Therefore, new interventions such as the triad of assessment model are required to enhance nurses' critical thinking skills and medical-surgical competencies. Nursing practice requires adequate knowledge and skills on numerous health conditions from the nursing staff in order to cope with the ever-increasing demand for care. Therefore, the nurses' ability to analyze patients' health conditions using vital signs, laboratory data, and physical assessment findings, and identify important signs and symptoms that may lead to deterioration of the patients' conditions is important. As a result, the aim of the project was to improve the nurses'

competence in the monitoring of patients conditions through education, training, and the introduction of new technology to assist with early recognition.

Vigilance in the care for chronically ill patients is critical. In an acute care setting, the observation and early recognition of vital signs from patients are important in identifying preventable FTR situations. However, the nurses' ability to identify clinical issues was often underestimated due to the overreliance on EWS to provide accurate detection of deteriorations in the patients' physiological conditions. As a result, the nurses do not get the opportunity to obtain the patients' information through observation and some critical conditions may be missed thus resulting to FTR. The findings of the DNP project demonstrate the importance of continuous education and training of nurses on monitoring of patients' health statuses irrespective of the use of technology in taking measurements of vital signs and detection of any deviations in the patients' conditions.

In this project, I aimed to develop a medical-surgical plan for improvement of nursing staff's knowledge and skills on surveillance, vigilance, and early recognition of clinical deterioration of patients' health conditions. Comparison between the pretests and posttests indicated a gap for improvement in nurses' knowledge regarding effective care of patients in acute care setting. The educational modules that I administered during the DNP project were supported by research evidence. The contents of the educational interventions were based on the nurses' understanding of triad of assessment model and the CCM.

FTR can be controlled by proper vigilance, surveillance and monitoring of patients' deteriorating conditions, and improvement in critical thinking skills among the nurses. The findings of the DNP project indicated that implementation of a medical-

surgical competency plan improved nurses' critical thinking skills and their ability to recognize deteriorating patients' conditions and minimize the likelihood of FTR. FTR can cause high morbidity, mortality, and various complications that affect the patients, their families, and health care institutions economically. Therefore, the triad of assessment model will be used in the acute care setting in order to improve patients' health outcomes and quality of life.

In conclusion, the educational intervention was found to be effective in improving medical-surgical competencies and critical thinking skills among the nursing staff in an acute care unit at the VA Hospital. Based on the results of the DNP project, I recommended that medical-surgical competency plans be developed and implemented in additional acute care settings in the same institution to aid in reducing FTR rates. Based on my evaluation of the educational initiative, the implementation of educational interventions will significantly reduce FTR rates in acute care settings. In addition, further research on effects of the early recognition of clinical deterioration of a patient's condition and outcomes was recommended.

Section 5: Scholarly Product for Dissemination

This DNP project culminated in the development of the article, “The Role of Critical Thinking Skills, Assessment, and Education of Nurses in Reducing Adverse Patient Events,” which was to be published in a suitable nursing publication (see below). The dissemination of the project was through a PowerPoint presentation to the stakeholders at the VA Hospital.

Scholarly Manuscript

An Evidence-Based Educational Intervention to Improve Nursing Staff’s Critical Thinking and Decision-Making Skills

By

Rene Barron-Kagan, RN

Patient safety is a major priority in the provision of care to acute care patients (Rose & Clarke, 2010). Acute care patients are always at a higher risk of clinical deteriorations that may result in complications, and other life-threatening situations, or even death (Odell, 2010). It is through this failure to identify and correct patients’ deteriorating conditions that the concept of FTR is born (Hughes, Durham, & Alden, 2008). According to Friese and Aiken (2008), a majority of clinical deteriorations develop gradually and are accompanied by abnormal signs resulting from changes in the patients’ physiological conditions. However, if these physiological changes are identified and corrected in advance, complications and critical illnesses can be prevented or minimized (Meyer & Lavin, 2005).

In acute care settings, nurses are charged with observing and assessing patients' conditions to identify and intervene whenever patients' conditions deteriorate. According to Subbe and Welch (2013), *FTR* is the inability to prevent a patient's underlying illness from deteriorating (Henk, 2014). The rates of FTR are often used as an indicator for patient safety in all health care institutions (Friese & Aiken, 2008). FTR represents a highly sensitive concept in nursing care as it acts an indicator for nursing outcomes (Friese & Aiken, 2008). Therefore, the causes of FTR cannot be addressed without involving the nurses' cognition and decision-making skills regarding patients' conditions (Aiken, Clarke, Cheung, Sloane, & Silber, 2003). Due to nurses' role in identifying vital signs, analyzing laboratory data, and assessment of physical findings, it is important to ensure the nurses behavioral principles and management techniques concur with the practicum. In this DNP project, I focused on the role of nurses in reducing FTR rates through improved education and training on patient assessment which entails: Physical assessment, monitoring of vital signs, and analysis of patents' laboratory data. In addition, I described the concepts of surveillance, vigilance, early recognition of patients' clinical deterioration, and FTR in relation to nurses' cognition and critical thinking skills. The aim was to use the CCM to develop a medical-surgical plan through the triad of assessment to improve nurses' critical thinking skills and their ability to correlate effectively between the use of laboratory data, physical assessment findings, and vital signs to monitor patients' conditions.

Methods

In this project, I used pretests and posttests to evaluate the effectiveness of the triad of assessment educational tool on nursing staff's critical thinking skills and

vigilance in an acute care setting. Nursing staff participated in the educational sessions after completing a pretest survey. The educational modules consisted of components of the triad of assessment (Module 1), surveillance, early recognition, vigilance competency (Module 2), oxyhemoglobin dissociation curve (Module 4), orthostatic blood pressure and mean arterial pressure (MAP) (Module 4), SEPSIS (Module 5), and pneumonia (Module 6). I conducted a posttest 10 to 15 minutes after the educational modules to evaluate the effectiveness of the educational program.

The participants included clinical staff from three medical-surgical departments of a VA Hospital. The participants were aged between 22 and 64, and their nursing experience ranged from 1 year to 25 years. The demographic characteristics of the participants were as follows: Caucasians (50%), Hispanics (45%), and African-Americans (5%).

The first step in data collection involved the use of a demographic sheet which was used to collect participant's information. I used a pretest questionnaire to collect test the nursing staff's baseline knowledge on the triad of assessment model and procedures for prevention of FTR. After administration of the educational modules, I provided the nursing staff with posttests to test the effectiveness of the educational modules. Finally, I used an evaluation survey to collect data on the overall performance of the nursing staff after receiving the educational modules.

I used a demographic sheet to collect information regarding the nursing staff's certification, gender, experience, names, and educational level. I also used a pretest questionnaire to collect the nursing staff's baseline knowledge on the triad of assessment model and procedures for prevention of FTR. I used the pretest questionnaire as a posttest

to assess whether the nursing staff benefited from the educational modules. The evaluation survey consisted of 8 questions intended for RNs, LPNs, and Nursing aide staff.

I conducted statistical analysis by comparing the pretest scores alongside the posttest scores. I used Data from the pre and posttests to address three research questions: (1) Will a comprehensive medical-surgical competency plan on assessment increase a nurse's ability to recognize early signs of a patient who is clinically deteriorating? (2) Will a comprehensive medical-surgical competency plan increase a nurse's ability to think critically and intervene appropriately, and (3) Will the posttest results confirm a nurse's (a) grasp of definitive criteria indicating a patient's declining status, (b) understanding of how and when to notify the RRT, and (c) ability to recognize unforeseen variables which have contributed to inadequate assessment and may have led to FTR?. I then conducted t-tests to compare the individual mean scores for the pre and posttests.

Findings

Because I performed the pretests and posttests immediately before and after the educational intervention respectively, all the nursing staff who participated in the educational modules completed both the pretests and posttests questionnaires. The pretest and posttest scores' distribution is illustrated in Table 1.

Table 1

Average Scores for Pretests and Posttests Scores for RNs and LPNs

Module	N	Pretest	Posttest
1. Components of the triad of assessment	27	2	4
2. Surveillance, early recognition, vigilance competency	26	3	5
3. Oxyhemoglobin dissociation curve	23	3	5
4. Orthostatic blood pressure and mean arterial pressure	22	3	5
5. Sepsis	22	2	4
6. Pneumonia	29	3	5
Total Average Score		2.3	4.7

The scores on the pretests for the six modules ranged from 2 to 3 points with a total average score of 2.3 points. The scores on the posttests ranged from 4 to 5 points with a total average of 4.7 points. Regarding knowledge of how the triad of assessment components related to patients' conditions (Module 1) and SEPSIS (Module 5), the participants' registered average scores of 2 points in the pretest and 4 points in the posttest. Similarly, participants recorded average scores of 3 points in the pretests and 5 points in the posttests in Module 2 (surveillance, early recognition, and vigilance), Module 3 (Oxy-hemoglobin dissociation curve and oxygen saturation), Module 4 (orthostatic blood pressure and mean arterial pressure), and Module 6 (pneumonia).

Project question 1: Will a comprehensive medical-surgical competency plan on assessment increase a nurse's ability to recognize early signs of a patient who is clinically deteriorating?

I addressed this project question by comparing the nursing staff's scores on the pretests and posttests regarding Module 1 and Module 2. Questions regarding Module 1 were mainly aimed at assessing improvement in nursing staff's knowledge concerning

the components of the triad of assessment which included physical assessment, vital signs, and laboratory values. In addition, Module 1 was aimed at equipping the nursing staff with knowledge of how the components of the triad of assessment model could be applied when assessing patients' conditions. The average scores on the pretests (2 points) and posttests (4 points) for Module 1 indicated an improvement in the nursing staff's knowledge regarding the components of the triad of assessment model after the educational modules. Improvement of knowledge of nursing staff regarding the components of the triad will increase their ability to recognize deteriorating patients' conditions, and thereby minimize the likelihood of FTR.

Module 2 focused the nursing staff's competency regarding surveillance, early recognition, and vigilance. Module 2 consisted of lessons regarding the processes of data collection, interpretation, and synthesis which are critical for clinical decision-making. I also educated the nursing staff on the significance of early recognition in reducing FTR and improving patient outcomes. I also focused Module 2 on providing the nursing staff with the operations that they should avoid to minimize the risk of FTR. The average scores on the pretests and posttests for Module 2 were 3 points and 5 points respectively. Comparison between the scores on the pretests and posttests indicated an increase in the nurse's ability to recognize early signs of a patient who is clinically deteriorating.

Project Question 2: Will a comprehensive medical-surgical competency plan increase a nurse's ability to think critically and intervene appropriately?

The purpose of Module 3 was to improve the nursing staff's knowledge regarding the oxyhemoglobin dissociation curve, which measures the affinity of oxygen to bind with hemoglobin. I used module 3 to test the nursing staff's abilities to use knowledge of

the oxyhemoglobin dissociation curve to identify the initial stages of hypoxia, which may result in FTR. The average scores on the pretests and posttests were 3 points and 5 points respectively.

The goal of using Module 4 was to improve the nursing staff's knowledge regarding orthostatic blood pressure and MAP. After completing Module 4, I expected the nursing staff to be able to define orthostatic hypotension and the psychological occurrences that accompany the disorder. In addition, I expected the nursing staff to be able to explain why orthostatic hypotension occurs, the conditions that may cause orthostatic hypotension, and the complications that are linked with being orthostatic. Based on the results of this project, the nursing staff registered average scores on the pretests and posttests of 3 points and 5 points respectively. The increase in points implies that the medical surgical-plan increased the nursing staff's knowledge of orthostatic blood pressure, and their ability to detect symptoms and signs of orthostatic blood pressure and the conditions that may lead to the disorder.

The goal of using Module 5 was to improve knowledge of SEPSIS, severe sepsis, and septic shock among the nursing staff. After completing Module 5, I expected the nursing staff to improve their skills in identification of the signs and symptoms of systemic inflammatory response syndrome (SIRS) criteria using the triad of assessment model. In addition, I expected the nursing staff to understand the role of MAP. The scores on the pretests and posttests for Module 5 were 2 points and 4 points respectively. The increase in points indicates an improvement in the nurses' ability to identify symptoms and signs of sepsis among the patients, and use clinical knowledge to intervene appropriately.

The purpose of Module 6 was to improve the nursing staff's knowledge regarding pneumonia, its complications, and the nursing and medical interventions that are used in the care of patients with pneumonia. I expected knowledge on pneumonia to improve the nurses' ability to detect symptoms and signs of SIRS Criteria using the Triad format and the three key nursing interventions that can be utilized in the care of patients with pneumonia. The average scores on the pretests and posttests for Module 6 were 3 points and 5 points respectively, therefore, indicating an improvement in the nurses' ability to identify signs and symptoms of pneumonia and use their critical thinking skills to intervene appropriately. Overall, these findings indicate an improvement of nursing staff's ability to think critically and intervene appropriately when patients' conditions deteriorate.

Project Question 3: Will the posttest results confirm a nurse's (a) grasp of definitive criteria indicating a patient's declining status, (b) understanding of how and when to notify the RRT, and (c) ability to recognize unforeseen variables which have contributed to inadequate assessment and may have led to FTR?

I addressed project question three by comparing the scores on the pretests and posttests of all of the six educational modules. The average score for the pretests for all the six modules was 2.3 points out of 5 points while the average score for all the posttest scores was 4.7 points. The increase in average scores indicates that the medical-surgical competency plan improved the nursing staff's grasp of definitive criteria that are used to indicate patients' deteriorating statuses, understanding when to notify RRT, and identifying hidden variables that may lead to FTR.

After completion of the educational intervention, I assigned scores to all the participants based on a Likert scale rating ranging from 1 (Absolutely Disagree) to 5 (Absolutely Agree). The results of the initiative assessment survey of the RNs and LPNs participating in the educational intervention are provided in Table 2. The purpose of the assessment survey was to test how the staff performed as a group after the educational intervention.

Table 2

Average Scores of Posttests for RNs and LPNs

Module	<i>N</i>	Average score
7. Components of the triad of assessment	27	4.6
8. Surveillance, early recognition, vigilance competency	26	4.7
9. Oxyhemoglobin dissociation curve	23	4.6
10. Orthostatic blood pressure and mean arterial pressure	22	4.6
11. Sepsis	22	4.6
12. Pneumonia	29	4.8

The Nurse's aides staff did not participate in the educational modules. However I provided them with modules on pulse oximetry and orthostatic hypotension. The results of the posttest are provided in Table 3. The results indicate that the nurse's aides staff significantly increased their knowledge of pulse oximetry and orthostatic hypotension after receiving the educational modules.

Table 3

Average Scores of Posttests for Nurse's Aides

Module	<i>N</i>	Average score
Pulse Oximetry	5	4.6
Orthostatic hypotension	5	4.6

After the educational intervention, I assigned scores to the nursing staff based on how well they performed as a group after the educational intervention. The Likert scale ranged from 1 (Absolutely Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Absolutely Agree). I found that the highest collective average score for the nursing staff (4.8) regarding questions about pneumonia (Module 6), followed by knowledge of surveillance, early recognition, and vigilance competency (4.7) (Module 2). The staff received scores of 4.6 points regarding knowledge of the components of the triad model (Module 1), oxy-hemoglobin dissociation curve (Module 3), orthostatic blood pressure and MAP (Module 4), and Sepsis (Module 5). Finally, the nurse aide staff who were provided with modules on pulse oximetry and orthostatic hypotension ($N=5$) attained average scores of 4.6 points for both modules (Table 3). Overall, the findings of the project initiative indicated that the educational program improved the nursing staff's knowledge regarding the medical-surgical competencies.

Discussion

Based on the results of the posttests, the participants indicated improved knowledge after receiving educational modules. As evident from the average scores from all the modules, education of nurses on the medical-surgical intervention (triad of assessment) improved the participants' knowledge and critical thinking skills regarding the components of the triad of assessment model and the procedures for prevention of FTR. The findings imply that the health care sector should invest in training and education of nurses to improve their medical-surgical competencies and critical thinking skills in the provision of nursing care. Continuous education of nursing staff in the acute care setting is also important. Based on the results, nursing staff benefited from

educational programs, therefore, their skills and knowledge should be enhanced through training and education. By providing adequate training and education to critical care nurses, the rates of FTR will reduce due to improved vigilance, early recognition, surveillance, and patient assessment (Ghaferi, Birkmeyer, & Dimick, 2009). Therefore, there is a need for a comprehensive medical-surgical plan in the US health care system in order to enhance nursing staff's critical thinking skills in acute care settings.

These findings support the argument that education and training of nurses are more beneficial than automation of patient monitoring procedures in the health care institutions (Hughes, 2008). The findings also indicate that nursing staff are ready to improve their clinical knowledge and critical thinking skills. By scoring an average of at least 4.6 points in all the modules, the participants demonstrated high efficiency in utilizing knowledge gained from the educational modules. Therefore, by adopting an effective medical-competency plan, nursing staff can help improve patient safety through reducing FTR rates. In addition, Aiken et al. (2003) argued that it is important to equip nurses with effective clinical reasoning skills in order to attain positive patient outcomes.

Practice Implications

Training of nurses on medical-surgical competencies enhances nurses' abilities to recognize complications, and also improves their critical thinking, communication, and teamwork skills. Therefore, bedside nurses need to be empowered to be able to take the initiative whenever they recognize deterioration in a patient's condition. Through this DNP project, I indicated that the introduction of new educational interventions in health care, such as the triad of assessment model, can enhance nurses' critical thinking skills and medical-surgical competencies, thus, reducing the cases of FTR. In addition,

effective educational interventions can be used to improve care quality in acute care settings through early recognition of patients' deteriorating conditions, which reduces the likelihood of complications, morbidity, mortality, and FTR. Further, education and training of nursing staff using the medical-surgical competency plan can improve their clinical skills and simplify the nurses' tasks, while providing care for acute care patients due to improved clinical decision-making ability. As a result, nurses can effectively prevent complications from developing into FTR.

Conclusion

The educational intervention was found to be effective in improving medical-surgical competencies and critical thinking skills among the nursing staff in an acute care unit at the VA Hospital. Based on the results of the DNP project, I recommended that medical-surgical competency plans be developed and implemented in additional acute care settings in the same institution to aid in reducing FTR rates. Based on my evaluation of the educational initiative, the implementation of educational interventions will significantly reduce FTR rates in acute care settings. In addition, further research on effects of the early recognition of clinical deterioration of a patient's condition and outcomes was recommended.

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Appendix A: Objectives of the Education Modules

Rene Kagan, DNP Student and Faculty at Carrington College, ADN Program

Student under Dr. Cynthia Nuttall, managed by A. von Dielingen and T. Gresham.

Live education for M-S Rocks! Competency Plan: 15 minute modules for M-S Licensed Staff,

NA welcome. Starting: Friday 7/18/14 and continuing weekly x 6. Modules given for night shift and day shift. Modules will be logged into the VHA TMS (learning system) as a “just in time” competency.

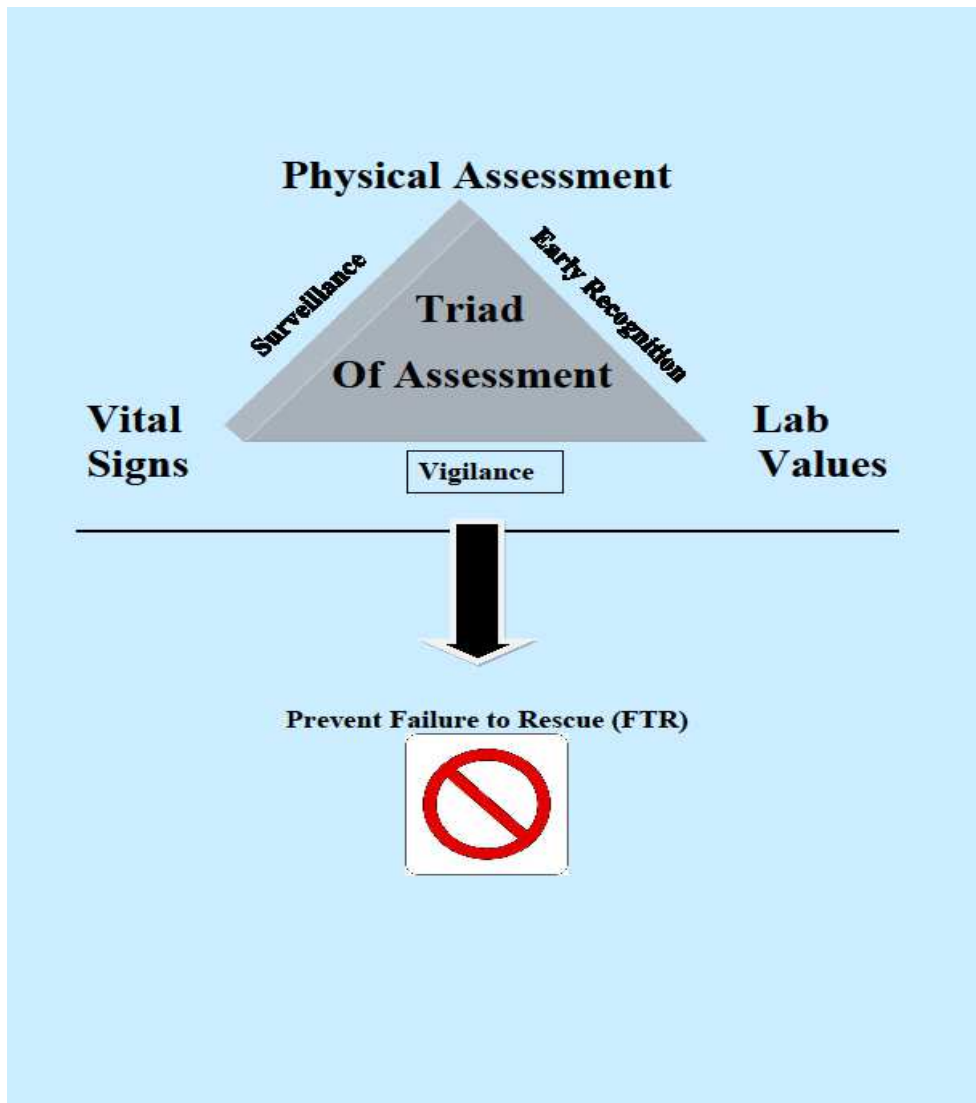
- 1) Triad of Assessment
 - a. Nursing staff will recognize the components, importance, and relevance of the Triad of Assessment (VS, Assessment, Labs) in correlation to patient acuity and outcomes.
- 2) Recognition, Surveillance, Vigilance, and Failure to Rescue
 - a. Nursing staff will verbalize the importance and relevance of early symptom recognition, surveillance, vigilance in relation to positive patient outcomes.
- 3) Oxyhemoglobin Assoc-Disassociation Curve
 - a. Nursing staff will understand the relationship of oxygen saturation to the oxyhemoglobin association-disassociation curve and how this relates to our patient assessment and outcomes.
 - b. Nurses’ aides will understand accurate procedure for collection pulse oximetry measurements.

- 4) Orthostatics and MAP and what this means when related to the Triad and Surveillance
 - a. Nursing staff will articulate the variables involved in orthostatic hypotension and the MAP and how this correlates to patient outcomes and treatments.
 - b. Nurses' aides will understand accurate procedure for collection orthostatic hypotension measurements.
- 5) Sepsis – exemplar
 - a. Nursing staff will articulate the S/S of sepsis and how this correlates to patient acuity and tied into the triad of assessment and early recognition.
- 6) Pneumonia – exemplar
 - a. Nursing staff will articulate the S/S of pneumonia and how this correlates to patient acuity and tied into the triad of assessment and early recognition.

Appendix B: Medical-Surgical Competency Modules 1–6 and Pretest and Posttests

Module 1:

RN/LPNs (NAs FYI)



The components of the triad of assessment (Physical assessment, vital signs and lab values) are all like pieces in a puzzle, they are interconnected and should all be considered when assessing patient status. As Florence Nightingale stated, “a nurses’ role is to put the patient in the best condition for nature to act upon him.” To do this, nurses must have an in-depth understanding of how to strengthen a person’s internal and external environment. Advocacy and a thorough assessment of the patient’s condition is our responsibility. The triad of assessment is a tool to support you in this role.

Questions you may ask yourself when you assess your patient’s status: "What is going on here?" "What does it mean?" "Is it significant?" and “How should I follow up?”

If a patient is symptomatic or you find an abnormal assessment finding, the combination of these three assessment findings can help you determine what may be going on.

Use the Triad to:

- 1. Consider and compare new data with baseline.**
- 2. Explore all variables of change in status (could be simple), but meaningful.**
- 3. Improve patient outcomes.**

-
- 4. Provide a framework for nurses to fully assess patients and make correlations of findings for each of the components of the Triad.**
 - 5. Increase nurses ability to early recognize deterioration of patient status.**
 - 6. Help determine appropriate acuity to fit nursing unit via specific indicators and assessment data.**
 - 7. Decreased transfers to ICU (improve early recognition, intervention and rapid response thus preventing unnecessary transfers to ICU and code blues).**
 - 8. Decrease morbidity and mortality.**

Benner, P. Strengths-Based Nursing: Moving Beyond Deficits in Nursing Practice and Nursing Education. www.educatingnurses.com

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<http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Volume102005/No3Sept05/ArticlePreviousTopic/VigilanceTheEssenceofNursing.htm>

Print Name/Title: _____ **Unit:** _____ **Date:** _____

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For Triad Competency: Review how the three components of the Triad connect to a patient's condition:

You have a patient with an internal defibrillator. He becomes increasingly agitated and while sitting up in a chair, slumps over and passes out and was found pulseless. Patient regained consciousness following a brief round of compressions. P-110, BP 145/114, O2 Sat 94%:

What do you believe happened and how would the three triad components work together to help you formulate an assessment. There could be more than one answer. You can consider possibilities of what lead up to the event.

Additional pt. findings: T-99, P-88-134, B/P 114/84 to 164/88, RR-22-32, PE on CT, Lactate 3.9-2.9, Troponin .02-.7, Diagnosis: PE, active infection, AMS

- Low grade temp - increased WBC, secondary to PE/Sepsis
- Tachycardia - hypotension, or decreased air exchange due to PE, and agitation, pain
- Hypertension – agitation, pain
- Increased WBC – trending up due to PE, infection, sepsis
- Increased lactate – trending to Sepsis/SIRS
- Troponin – unremarkable
- ICD interrogation – unremarkable

Module 2:**Surveillance:**

- The surveillance process includes ongoing data collection, interpretation, and synthesis for decision making. This research proposes that nursing surveillance is comprised of five dimensions: actions, expertise, early recognition, intuition, and decision making.
- Harmer and Henderson (1939): “The habit of observation is one of the most (if not the most) essential qualities in nursing. ...The responsibility [to observe] is distinctly that of the nurse, for during the greater part of the time she/he is the only one present to care for the patient and thus to observe and report” Minick (1995)

Early Recognition:

- Because nurses' early recognition of patient problems is a key aspect in producing positive patient outcomes in acute care settings, the skill of early recognition, is critical to quality care.
- An important aspect of clinical judgment is the early recognition of patient problems.
- Without exception, whenever nurses identified changes in patient status, threads of caring and concern were involved.
- While the warning signals in a given situation include data such as the heart rate, blood pressure, and level of consciousness, the small changes in these values alone may be clinically insignificant.

- When the nurse combined data with the changes in color and the overall presentation of the patient, their significance took on new meaning. Missing the connection here ties in to the triad of assessment and anticipating "what might be going on."

Vigilance:

- Vigilance has been defined as "a state of watchful attention, of maximal physiological and psychological readiness to act and of having the ability to detect and react to danger" (Hirter & Van Nest, 1995, p. 96). Drawing upon and adding to the precision of this definition, professional nursing vigilance may be defined as a state of scientifically, intellectually, and experientially grounded:

- Attention to and identification of clinically significant observations/signals/cues;
- Calculation of risk inherent in nursing practice situations
- Readiness to act appropriately and efficiently to minimize risks and to respond to threats.

Failure to Rescue (FTR) (AVOID this!):

- The definition of FTR is "a clinician's inability to save a hospitalized patient's life when he or she experiences a complication (a condition not present at admission).
- To "rescue" a patient appropriately, the nurse must be able to anticipate when complications are likely to occur and rapidly recognize cues that indicate that problems are beginning (Clarke & Aiken, p. 43).
- Surveillance, involving frequent assessments, is required, as is the ability to analyze information and react to the implications of that analysis in a timely manner.

- Reacting to information and intervening appropriately are the result of professional nursing vigilance and will often include both independent nursing action and mobilization of other members of the health care team.
- FTR results in preventable deterioration, severe disability, or death.
- Between 2004 and 2006 Health Grades determined FTR claimed more than 188,000 lives.
- Subtle reactions can escalate from mild concern to severe within minutes or hours. One must focus on basics such as breathing, circulation, and bleeding to prevent FTR.

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For Surveillance, Early Recognition, Vigilance Competency – Answer the following:

1. Give an example of how surveillance, early recognition, vigilance and failure to rescue are all interconnected.

2. How do these four concepts relate to the triad of assessment?

3. These concepts go deep. Write a sentence about how the above concepts relate to the following phrases:

- Communication and teamwork –
- Hand off report –
- Surveillance, Early recognition, Vigilance of each other! –
- Professional practice –

Again, we OWN this. It is who we are and what we do! When we are successful at implementing these four concepts consistently we leave our work every day feeling a sense of accomplishment and purpose.

What a beautiful thing!

OXYHEMOGLOBIN DISSOCIATION CURVE

Module 3:

RNs, LPNs, NAs

What is this Curve?

- **The Oxyhemoglobin Dissociation curve (hemoglobin binding curve) describes the tendency for oxygen to bind to hemoglobin: below a SaO₂ of 90%, small differences in hemoglobin saturation reflect large changes in PaO₂.**
- **Reflects how hemoglobin acquires and releases oxygen molecules into the plasma.**

What is the PaO₂ (Oxygen pressure)?

- **This is the amount of oxygen that is dissolved in the blood. The normal PaO₂ level should be between 80 - 100 mmHg. If it is below 80 there is evidence of hypoxemia, therefore, no compensation is done to restore the pH balance.**
- **PaO₂ determines the oxygen saturation of hemoglobin.**
- **The Oxy-Heme Dissociation curve indicates how PO₂ effects the binding of oxygen to hemoglobin, which then is delivered to cells.**

What is Oxygen Saturation (SaO₂)?

- **Amount of oxygen in blood plasma that is attached to hemoglobin.**
- **Oxygen saturation is a measure of how much oxygen the blood is carrying as a percentage of the maximum it could carry.**

Why is it relevant to nursing care?

There are 4 oxygen binding sites on the Iron (Fe⁺⁺) part of the hemoglobin of red blood cells. Once one oxygen molecule drops off the hemoglobin the other three molecules more readily drop off. Once one molecule binds the other three more readily bind. So the effect/cascade of desaturation can be near exponential (as reflected in the disassociation curve). When a patient is de-saturating, the P_O₂ level

can reflect levels that are consistent with systemic hypoxemia and an imbalance in pH leading to unsustainability of life.

Hebert, P.C. (1998) Transfusion requirements in critical care (TRICC): A multicenter, randomized, controlled clinical study. Transfusion Requirements in Critical Care Investigators and the Canadian Critical care Trials Group. *British Journal of Anesthesia*, 81 (1), 25-33.

For Oxy-Heme Dissociation Curve and Oxygen Saturation Competency graph the following values (items 1 and 2) on the Curve of the next page:

1. Locate a pulse saturation value of 90% and 95% on the curve below (left axis). Identify the PaO₂ levels of each on the bottom (pressure of free oxygen in the plasma) axis.
2. Locate a pulse saturation value of 90% and 85% on the curve below. Identify the PaO₂ levels of each on the bottom axis.
3. Notice how the curve starts to sharply drop off after 90% oxygen saturation. This is when hypoxia starts to develop. Think of your patients that have had low O₂ sats, think of what they looked like and how poorly they could recover following any

activity causing increased oxygen demand. Relate this to being vigilant with your patients.

Print Name/Title: _____ **Unit:** _____ **Date:**

MOD: 3

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Mosby's Nursing Consult

Books

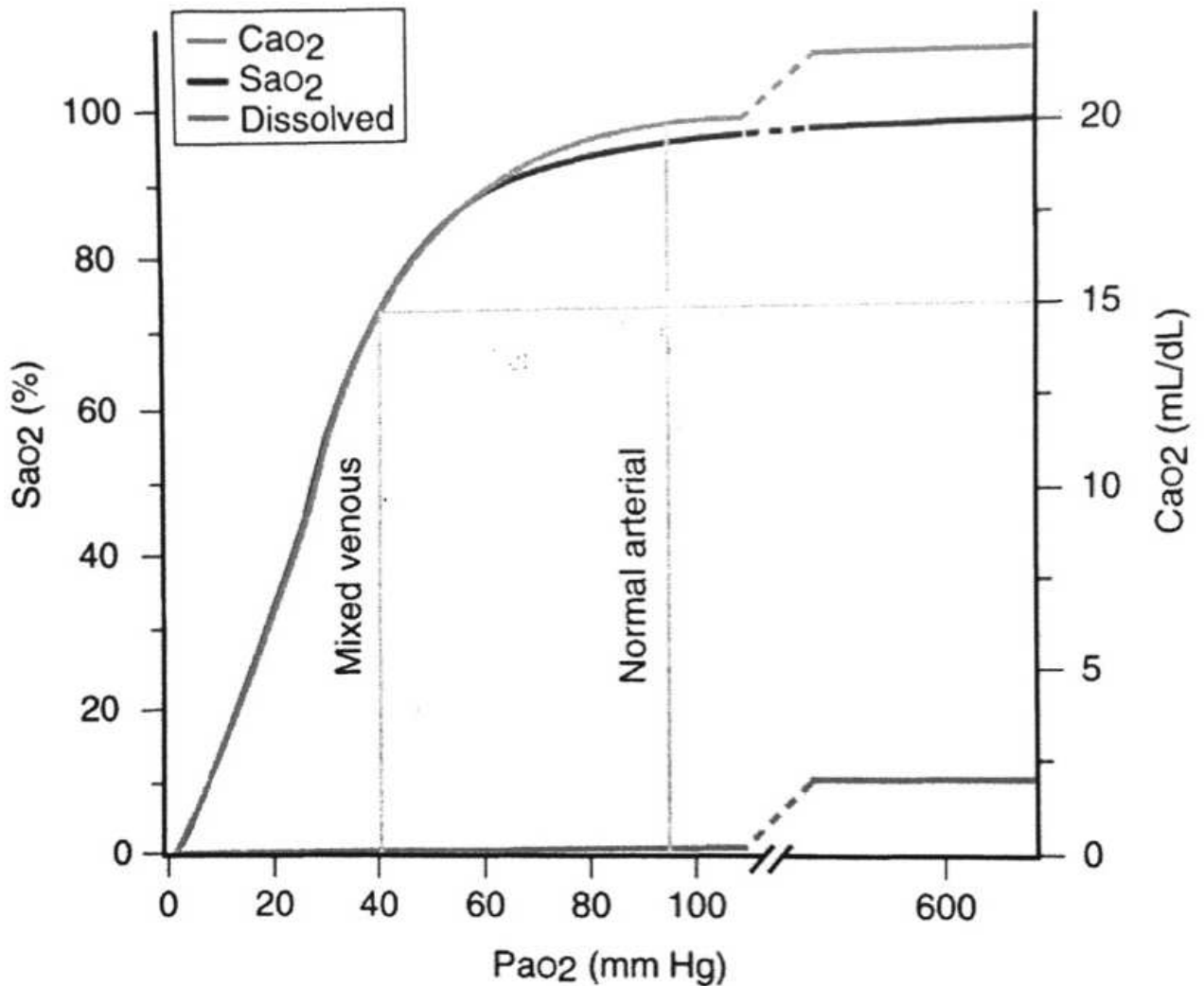


FIGURE 104-1 Oxyhemoglobin association-dissociation curve. The axis for oxygen saturation in the arterial blood (SaO_2) is on the left, and the axis for arterial content of oxygen (CaO_2) is on the right. CaO_2 is the sum of the oxygen dissolved in plasma (denoted as "Dissolved" in the figure) plus the oxygen bound to hemoglobin. At a normal hemoglobin, most of the oxygen is carried in combination with hemoglobin, with only a relatively small amount of oxygen dissolved in plasma. When the arterial partial pressure of oxygen (PaO_2) is on the "flat" portion of the curve (PaO_2 60 to 65 mm Hg, normal partial pressure of carbon dioxide [Pco_2], and normal pH), raising the PaO_2 further has relatively little effect on total oxygen content. Increases in temperature, Pco_2 , hydrogen ion concentration, or 2,3-diphosphoglycerate cause a rightward shift in the oxyhemoglobin association-dissociation curve.

NURSES AIDES:

- **Remember, you are the eyes and ears for our patients. When you see O2 saturations below 90 be sure to talk with your RN/LPN counterpart. These values should be trended and monitored.**

Orthostatic Blood Pressure and Mean Arterial Pressure (MAP)**Module 4****RNs, LPNs, NAs**

- **Orthostatic hypotension is *defined as*:**
 - **a decrease of at least 20 mm Hg in systolic blood pressure**
 - **or 10 mm Hg decrease in diastolic blood pressure**
 - **or a rise in the pulse rate of 20 bpm or more.**

This occurs within 1 - 3 minutes of standing. Orthostasis means upright posture, and hypotension means low blood pressure.

What is happening physiologically?

- **Vasodilation (vessels are not constricting adequately in response to change in position) or hypovolemia. The normal response is to vasoconstrict when moving to a sitting or standing position.**

- **You might see dizziness, faintness or lightheadedness and is caused by low blood pressure.**

Why does this happen:

- **Dehydration, fever, vomiting, severe diarrhea, and strenuous exercise with excessive sweating can all lead to dehydration. When you become dehydrated, your body loses blood volume. Mild dehydration can cause symptoms of orthostatic hypotension, such as weakness, dizziness and fatigue.**
- **Heart problems can lead to low blood pressure include extremely low heart rate (bradycardia), heart valve problems, heart attack and heart failure. These conditions may cause orthostatic hypotension because they prevent your body from being able to respond rapidly enough to pump more blood when needed, such as when standing up.**
- **Endocrine problems: Thyroid conditions, adrenal insufficiency (Addison's disease), low blood sugar (hypoglycemia) and, in some cases, diabetes can trigger low blood pressure. Diabetes can also damage the nerves that help send signals regulating blood pressure.**
- **Nervous system disorders such as Parkinson's disease, multiple system atrophy, Lewy body dementia, pure autonomic failure and amyloidosis can disrupt your body's normal blood pressure regulation system.**
- **After eating: Some people experience low blood pressure after eating meals (postprandial hypotension). This condition is more common in older adults.**
- **S/p cardiac catheterization or any procedure with conscious sedation**

- **Medications: diuretics, levodopa, beta-blockers, calcium-channel blockers, nitrates (and other vasodilators).**
- **Hypovolemia (including that caused by dehydration, over diuresis, diarrhea, hemorrhage, burns, fever, and hot environment)**
- **Decreased baroreceptor sensitivity - most common in the elderly**
- **Common general neuropathies affecting the peripheral autonomic nervous system, including diabetes mellitus, alcohol abuse, and amyloidosis**
- **Prolonged bed rest**
- **Salt-free diet**
- **Also: anemia, sympatholytic drugs, diuretics, nitrates, narcotics, antihistamines, psychotropic agents, barbiturates, antihypertensive,**
- **Anticholinergic—can predispose a patient to orthostatic hypotension in the absence of hypovolemia.**

Consider:

Safety issues – especially FALLS

Anticipated treatments: Midodrine, fluid bolus, treat depending on cause.

Print Name/Title: _____ Unit: _____

Date: _____

5. What are the complications of being orthostatic?

SEPSIS:
(NA- FYI)

Module 5: RN, LPN,

What is Sepsis?

Sepsis is a potentially life-threatening complication of a known or suspected infection plus two or more signs of a systemic inflammatory response syndrome (SIRS).

Chemicals released into the bloodstream to fight the infection trigger inflammatory responses throughout the body, this inflammation can trigger a cascade of changes that can damage multiple organ systems, causing them to fail.

SEPSIS (See SEPSIS protocol next page):

- *SIRS Criteria*: 1) Temp \geq 101 or 96.8°F, 2) HR > 90 bpm, 3) RR \geq 20 or PaCO₂ < 32 mmHG, and/or
4) WBC \geq 12k or \leq 4k

- Sepsis: Known or suspected infection with 2 or more of the above SIRS criteria. Notify MD and be prepared to check serum Lactate, obtain cultures (blood, urine, etc.) prior to beginning antibiotics, assess for organ dysfunction (hypotension, oliguria, elevated lactate).
- Severe Sepsis: Sepsis plus failure of one or more organ system, hypotension, or perfusion abnormalities such as: peripheral edema, pulmonary congestion, tissue necrosis, DIC, thrombocytopenia, lactic acidosis, decreased systemic vascular resistance, and decreased cardiac contractility.
- Septic Shock: Severe sepsis associated with refractory hypotension (BP<90/60) despite adequate fluid resuscitation, plus failure of two or more organ systems. Death is the culmination of unresolved multiple organ dysfunction syndrome (MODS).

This can all happen VERY QUICKLY – Surveillance, early recognition and vigilance are KEY.

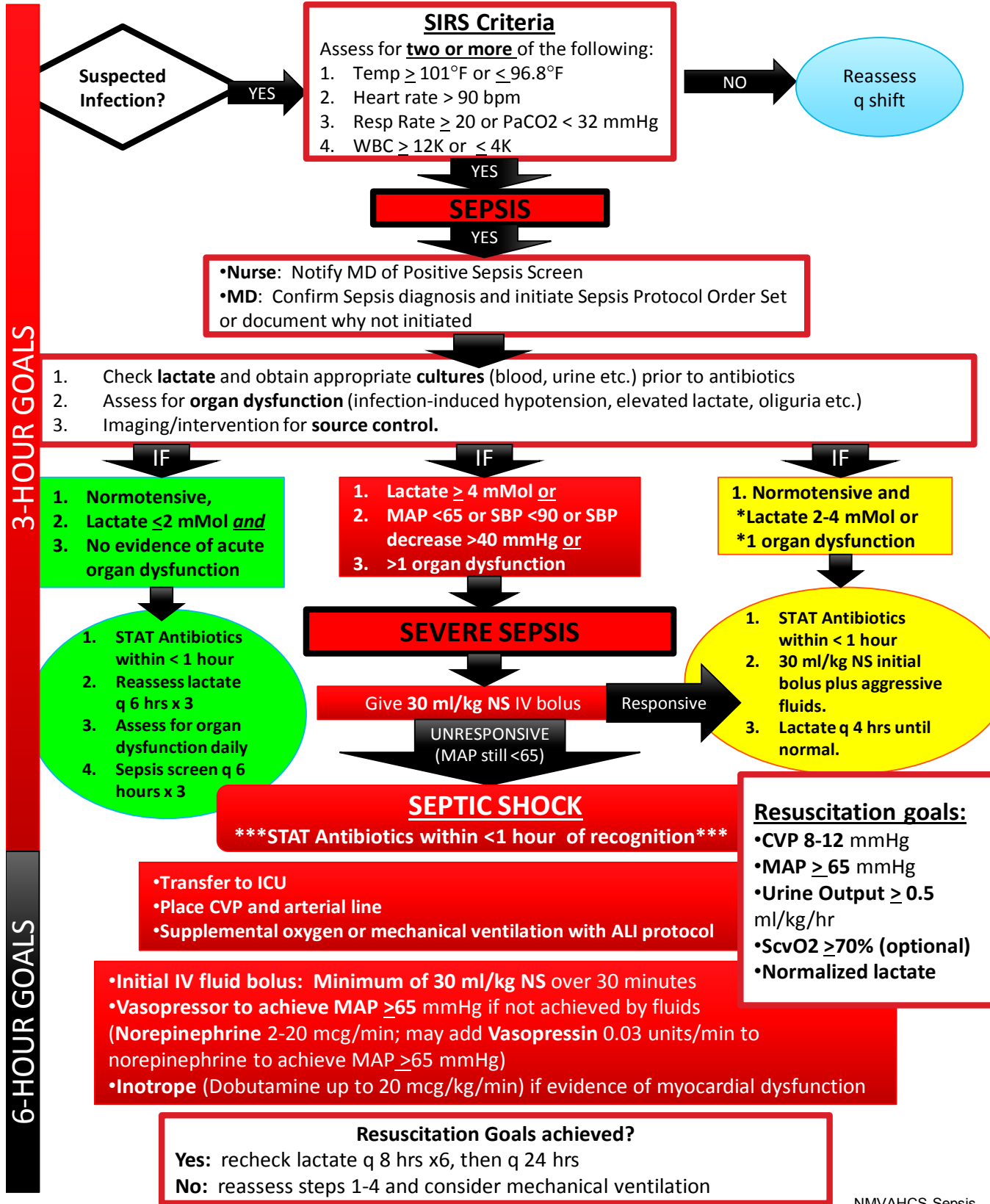
What is happening physiologically?

- Microorganisms release toxic substances that trigger progressive, complex protagonistic/antagonistic host defenses that become maladaptive if not controlled.
 - Pro-inflammation vs. anti-inflammation: WBCs activated, endothelial cells activated, histamines and bradykinins are released causing further vasodilation and vascular permeability.
 - Pro-coagulation vs. anti-coagulation

- Coagulation cascade stimulated and microvascular thrombi form to trap microorganisms.
- Delayed release of counteracting anticoagulation factors allow time for destruction of microorganisms
- However, pro-coagulation is favored as sepsis progresses and DIC is precipitated.
- Endothelial damage results from excess inflammation and unresolved coagulation, systemic dysfunction amplifies and sepsis becomes increasingly severe advancing to Severe Sepsis then to Septic Shock.
- The result of this cascade of events is massive vasodilation, lactic acidosis (due to tissue anorexia thus anaerobic metabolism, secondary to the lack of perfusion because of the vasodilation.
- There is a short window of time to catch this cascade of events (*think surveillance, early recognition, and vigilance to prevent failure to rescue*) and implement stat measures. The protocol is to catch the early symptoms within an hour (see above and relate to the *triad of assessment – physical assessment, VS, and labs*) Patients have died of sepsis within a half hour! Nursing vigilance is imperative with sepsis.
- The treatment measures for sepsis are: fluid boluses for the hypovolemia, cultures, and then immediate antibiotics. Monitoring the MAP, the lactate, and then transfer to critical care are essential.

SEPSIS TREATMENT GUIDELINES

EARLY GOAL-DIRECTED THERAPY



3-HOUR GOALS

6-HOUR GOALS

Print Name/Title: _____ **Unit:** _____ **Date:**

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1. List early recognition signs and symptoms of SIRS Criteria, identify these criteria in the format of the Triad listed here:

Potential VS findings:

Potential physical assessment findings:

Anticipated lab findings (at least 2):

2. Describe the role of the MAP:

PNEUMONIA**Module 6: RN, LPN,****(NA- FYI)**

Pneumonia is an acute infection in one or both of your lungs. Fluid and/or pus fill the air space in the alveoli obviously impairing gas exchange and preventing oxygen from reaching the bloodstream. Bacteria, viruses, parasites and fungi can cause pneumonia. Complicating, related factors such as HF, COPD, smoking, pulmonary hypertension are often prevalent in our Veteran population. Aspiration is a potential cause.

What does it look like clinically?

Typical symptoms are:

- Cough-usually productive yellow or green and may be blood stained,
- Shortness of breath, tachypnea, chest tightness, crackles, rhonchi, and abnormal breath sounds
- Fever, fatigue, weakness, chills /sweats /shivers.
- They may be malnourished and/or immunocompromised.
- Aches and pains, especially in the side of the chest, are common.
- Increased WBC's and infiltrates in CXR

Complications include:

- Respiratory failure,
- Bacteria in the bloodstream (bacteremia),

- Sepsis,
- Acute respiratory distress syndrome (ARDS),
- Lung abscesses, pleural effusion or empyema

Nursing interventions:

Nursing interventions can positively impact and make a significant difference in/for pneumonia patients. This means that we have a direct impact on the outcome of this disease process!

- Improving airway, suctioning as needed
- Head of Bed up 30 degrees or higher, prevent and monitor for aspiration
- Monitoring V/S and taking action to normalize (temp, tachypnea, SOB)
- Monitoring oxygen saturation, trending, apply oxygen as ordered
- Maintain mobility – turn, cough, deep breathe – may use incentive spirometry, ambulate
- Promoting rest and conserving energy (while maintaining mobility)
- Daily oral assessment and care (*brushing teeth and tongue can reduce pneumonia by 37 %!*)
- Providing adequate nutrition and hydration
- Early recognition of symptoms, reporting complications, and vigilant monitoring of them
- Promoting patient knowledge
- Promoting Home and Community Based care

- Monitor for side effects of ABX (diarrhea, candidiasis, etc.)

Medical interventions:

- Oxygen
- Antibiotics
- RT/PT interventions (such as chest PT)
- Analgesics for pleuritic pain (can help increase mobility)
- Vaccinations: pneumococcal (anyone ≥65 y.o. or with high risk factors) and influenza
- Sputum and blood cultures

American Lung Assoc. (2014) Understanding pneumonia: <http://www.lung.org/lung-disease/pneumonia/understanding-pneumonia.html>

VA Office of Nursing Service – Presentation on Pneumonia (available through the VA intranet).

Print Name/Title: _____ **Unit:** _____ **Date:**

MOD: 6 **Return this completed form to Anna von Dielingen, Rm. 5A-115 or by email.**

1. What complication do you see in our veteran population that contributes to them getting pneumonia?

2. List early recognition signs and symptoms of SIRS Criteria, identify these criteria in the format of the Triad listed here:

Potential VS findings:

Potential physical assessment findings:

Anticipated lab finding(s):

3. What are three really important NURSING Measures that we can do for our patients with pneumonia?

Appendix C: Project Evaluation

Medical-Surgical Nurses Rock! Evaluation of 6 mini-education Modules:**Modules given to both shifts.****Scoring on a scale of 1-5. 1=Absolutely Disagree to 5= Absolutely Agree**

RN and LPN staff:	AVG. Score
1. Nursing staff will recognize the components, importance, and relevance of the triad of assessment (VS, physical assessment, labs) in correlation to patient acuity and outcomes.	4.6 N=27
2. Nursing staff will verbalize the importance and relevance of surveillance, early symptom recognition, vigilance in relation to positive patient outcomes.	4.7 N=26
3. Nursing staff will understand the relationship of oxygen saturation to the Oxyhemoglobin association-disassociation curve and how this relates to our patient assessment and outcomes.	4.6 N=23
4. Nursing staff will articulate the variables involved in orthostatic hypotension and the MAP and how this correlates to patient outcomes and treatments.	4.6 N=22
5. Nursing staff will articulate the S/S of sepsis and how this correlates to patient acuity and tied into the triad of assessment and early recognition	4.6 N=22
6. Nursing staff will articulate the S/S of pneumonia and how this correlates to patient acuity and tied into the triad of assessment and early recognition.	4.8 N=29

Comments:

1. Very good education. We need more. Very informative.
2. “We really like that you are doing these competencies for us”. We never get anything on our shift”.
3. “This has really been helpful”.
4. “This is great!”
5. “We are not used to getting this kind of stuff”
6. “We are hungry for information like this”.
7. “I hope you keep doing this”.
8. “Thank you so much for coming in during our shift, we sometimes feel left out”.
9. “Thank you for your efforts to help inspire critical thinking.”
10. “Thank you for the in-services, the staff really appreciate it.”
11. “It’s really helping a lot!”
12. “We were waiting for you; we are all ready”

Nurse’s Aide Staff:

<p>1. Nurses’ aides will understand accurate procedure for collection pulse oximetry measurements.</p>	<p>4.6 N=5</p>
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<p>2. Nurses' aides will understand accurate procedure for collection orthostatic hypotension measurements.</p>	<p>4.6 N=5</p>
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Society of
Critical Care Medicine
The Intensive Care Professionals



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