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UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF PHILOSOPHY IN NURSING

THE IMPACT OF A CLINICAL MENTOR PROGRAM ON PATIENT OUTCOMES

by

Cynthia M. Steckel

A dissertation presented to the
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requirements for the degree
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Dissertation Committee

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ABSTRACT

The increasing complexity of patient care requires an expert nurse to navigate the hospital stay, yet today's workforce brings a declining supply of seasoned nurses, creating a patient need/nurse expertise gap. The clinical mentor role was developed to bridge this gap and create a safety net, using expert nurses, relieved of a patient assignment, to provide oversight for quality patient care. Results reported elsewhere showed improvements in failure to rescue and pressure ulcers six months before and after implementation. The purpose of this study was to examine the long-term impact of this new care model over the subsequent three years on these nurse-sensitive indicators, and to explore the process by which patient outcomes were affected. A mixed-method embedded descriptive design made use of quantitative secondary data analysis of outcome measure data, along with qualitative situational analysis of data from 25 clinical mentor interviews.

Results showed that failure to rescue maintained the initial gain post implementation, but did not decrease (or increase) further over the study period. Medical surgical unit hospital acquired pressure ulcers (HAPU) and fall rates showed statistically significant improvement over time; Intensive care unit HAPUs did not significantly change. Qualitative mentor interviews validated their affect on these patient outcomes as well as on staff nurse growth and development, practice improvement, patient satisfaction, error prevention and the development of effective communication. To identify problems or gaps in care, mentors looked for congruency between what they noted in report or chart checks with what they found on rounds when assessing the patient. Eleven themes emerged to describe the processes used to affect patient outcomes,

which, when analyzed as a whole, were categorized into three areas of focus: improving effective communication, real time teaching, and taking the time for deeper, expert assessment and evaluation of patient situations. The study added to the general knowledge of expert/non-expert practice and the effect of a unit-based catalyst or guide on patient outcomes.

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DEDICATION

This dissertation is dedicated to

Cecelia Steckel (Mom)

Who supported my nursing career throughout my life, sent flowers on my anniversaries
and would have been proud to share this day,

and to

Thomas J. Steckel (Dad)

Who supported me with his prayers and encouragement.

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Chapter 1

Introduction

Almost a decade ago, after examining the current state of healthcare in the United States, the Institute of Medicine (IOM, 2000, 2001) called for substantial changes in order to improve patient safety and quality outcomes, through a series of groundbreaking reports. The reports stressed that reform around the margins will not be enough to address severe system problems. Among the subsequent recommendations for research and program implementation are those which strengthen nurse work environments and processes to achieve patient safety (IOM, 2004). Making up the largest body of healthcare professionals in the US and serving as the coordinators of care at the bedside, nurses have the greatest potential for leading the improvement in patient outcomes and safety. Yet the profession itself is not united on how to approach a new model of care to achieve this goal (Wiggins, 2008). In response to this challenge, a large metropolitan health care facility located in Southern California, developed the Clinical Mentor role for the oversight of patient care quality.

Background

Healthcare today has evolved with a changing patient profile that includes increased acuity from the aging patient population, decreased lengths of stay which

require more activity compacted into fewer days, and increased scrutiny and accountability for hospitals, physicians and nurses to show quality patient outcomes. The average length of stay for hospitalized patients has dropped 25% since the 1980s (TJC, 2008). The care required to match this patient profile, and achieve excellent patient outcomes, is an expert level RN at every bedside, to efficiently assess the patient's needs, manage the patient's stay within the short time frame and keep the patient safe from the potential hazards of hospitalization (Burrill, Wallace, Steckel & Hunter, 2007).

However, today's workforce reality brings a declining supply of seasoned RNs, as senior nurses leave for retirement or move on to less demanding environments. The latest available data show approximately 41% of the United States RN workforce were older than 50 years of age in 2004, up from 33% in 2000 (HRSA, 2004). Variability in educational preparation further complicates the development of expertise. In 2004 there were 38% BSN, 42% Associate Degree and 16% Diploma grads as well as 4% Masters/Doctoral RNs working in staff nurse roles in hospitals (HRSA, 2004). Benner (1983) described expertise as a function of clinical judgment, which is developed through experiential learning and pattern recognition. Notably, it is not something the schools can teach better or hospitals can affect with orientation. Rather, this nurse profile matched with the current patient requirements leads to a gap between RN expertise and patient need. Increasingly, when the patient needs an expert at the bedside for safe, efficient movement through the system and illness, there is more often a non-expert RN providing care.

Nurse Expertise/Patient Need Gap

While there have always been non-expert registered nurses (RN) practicing at the

bedside, historically, clinical leadership supports provided oversight for patient care on a day to day basis. These supports have grown in number over the years, yet are increasingly pulled away from the direct oversight of patient care. Managers and advanced practice nurses are pulled to duties involving the infrastructure of care, attending to complex workforce, best practice and system issues. Educators are often consumed with orientation needs. Charge nurses are occupied with patient flow coordination, and the supervision of greater numbers of registry and traveler RNs. Senior nurses, who are smaller in proportion and by virtue of their experience being assigned to the sickest patients, cannot oversee the activities around them, removing an important safety net of the past. Physicians were another support of the past for clinical discussions and learning opportunities, as they spent time on the units. Today, their time is often cut short by the managed care mandate of seeing more patients for a shorter time, which intensifies the need for salient, concise communication from an expert nurse.

The environment adds an additional level of complexity, with increased intensity, noise level and distractions from higher technology use, an increased number of ancillary staff on the unit, and the rapid turnover environment. The increasing demands of additional patient safety checks and documentation requirements in multiple formats, on computer and paper, compete for the RN's time and attention. The high regulatory atmosphere from payers, consumer groups and government, as well as the new transparency of quality measures on the internet, all create a highly complex unit environment requiring experts to navigate the day.

These patient, workforce and environmental factors create a greater need at the bedside for an expert level of care. Most critical is the ability to complete a quick,

accurate assessment, identifying salient information from the data obtained. Clear, concise communication to the physician and other members of the health care team is required. Appropriate interventions must follow to reduce patient safety risk and move the patient along the continuum, at an efficient pace. The mismatch of required expert nursing practice in an environment of novice level practitioners creates a nurse expertise/patient need gap that puts patients at risk (Burritt, Wallace, Steckel & Hunter, 2007).

Responses to the Nurse Expertise/Patient Need Gap

Nursing leaders have begun to design safeguards to help bridge the nurse expertise/patient need gap. One approach, developed by the American Academy of Colleges of Nursing (AACN, 2007), is based on a higher education focus with the institution of the masters prepared, Clinical Nurse Leader (CNL) role at the bedside. This approach reflects the work of Linda Aiken and colleagues (2004) on the connection between greater numbers of bachelor's prepared nurses at the bedside and lower patient mortality. The role is aimed at dealing with the increasing complexity and fragmentation of care as patients move from ICU to step-down to medical/surgical levels of care. The goal of the CNL is to oversee the lateral integration of care for a distinct group of patients, promoting evidence-based practice and evaluating patient outcomes to improve care. Inherent challenges in this approach include the small number of advanced practice RNs, as well as the lag time to educate and incorporate this role into common practice. Additionally, this role includes time pulled away from the bedside to fulfill administrative functions and performance improvement.

A second option, operationalized in the program which is the focus of this study,

has been grounded in the expertise developed through experience. The goal is to take advantage of the readily available knowledge base of the senior nurse experts who currently practice at the level required at the bedside, but are increasingly constrained by their own assignments or are likely to leave the bedside altogether as part of the aging workforce. One hospital, in the Western United States, has created a different role for these experienced nurses that would retain them at the bedside to spread their expertise throughout the unit and provide oversight for care, while relieving them of the physically demanding direct patient care assignment. Identified as clinical mentors, they round on patients, but work through the primary nurse to ensure appropriate care is given and excellent patient outcomes achieved. This role is grounded in Benner's (1983) proficient and expert levels of practice and is designed specifically to bridge the RN expertise/patient need gap. The advantages of the clinical mentor role include a currently available resource whose expertise has been acknowledged and respected by the staff, providing a more immediate opportunity for nursing to affect outcomes. In addition, the role saves the "brain drain" from the senior nurses retiring from the profession.

Both approaches, so far attempted, require additional resources and substantially change the model of patient care for nursing, yet little is described in the literature specifically addressing the nature of the RN expertise/patient need gap or measuring the effect on actual patient outcomes as a result of inserting a unit-based expert to help fill that gap. A greater understanding of the impact of these types of roles is essential to identifying the efficacy of such approaches, and others to come. This study was designed to address this research need, by examining the impact of one new patient care model on patient outcomes.

Theoretical Framework

Expert and Non-expert practice.

The picture of the nurse expertise/patient need gap can be envisioned through the nursing literature on expert practice and clinical decision-making, which helped serve as a foundation for the development of the clinical mentor role. There is a large body of work which has examined expert and non-expert practice in terms of how thought is oriented and how decisions are made. The primary framework for the clinical mentor role comes from Patricia Benner's (1983) model on skill acquisition for nursing. Benner identified a progression of different levels of expertise over time, from novice to expert, culminating in an intuitive, gestaltic grasp of patient care situations. The hallmark description of expertise in the Benner model is the development of pattern recognition, from multiple encounters with patients over a period of years, continually adding to a theoretical background of abstract knowledge.

Alternatively, decision-making strategies have been described as existing on a cognitive continuum based on the specific task at hand, from a linear, sequential process often applied by the novice, to an intuitive, clustering process developed from experience in a given setting (Thompson, 1999). Experts will use the full continuum of strategies, depending on the task complexity, ambiguity and how the situation presents (Thompson, 1999), as well as the experience of the nurse (Lauri & Salanterä, 1995; Lauri et al., 2001). Bonner & Walker (2004) noted that the experience of an expert must be built in a distinct field of specialization. Pyles & Stern (1983) add that experts are differentiated from non-experts by their observational ability, which is learned from a more experienced mentor. However, for this expertise to develop, a nurse must have timely access to a mentor RN,

who has both the expertise and approachability to share that expertise.

Influencing the Development of the Expert Level of Care

Methods for influencing the development of the expert level of care have been described in the literature as well. Activities fall under three general categories, the use of an expert guide (Ebright, Urden, Patterson & Chalko, 2004; Hanneman, 1996;), reflective practice (Dewar and Walker, 1999; Downey, 1993; Nelson, Apenhorst, Carter, Mahlum, & Schneider, 2004; Paget, 2001; Radwin, 1998; Tanner, 2006), and role modeling or mentoring (Benner, 1983; Pyles & Stern, 1983). These are the hallmarks of the clinical mentor program strategies, using an expert RN to role model and mentor with the use of reflective practice as they oversee care on the unit and monitor patient outcomes.

Hanneman (1996) developed the substantive theory of conversion in a study which built on Benner's (1983) work and aimed to describe how nonexpert nurses developed clinical expertise with exposure to a unit based expert. Her findings showed that expert and non-expert practices are substantially different and result in different outcomes, but that a unit-based expert could serve as a catalyst to advance the practice of non-experts toward that of expert care. The result of expert practice on patient outcomes was described as preventing complications, leading to purposeful recovery and demonstrated by humanistic care.

Complexity Science.

Past attempts in care reform have been grounded in Newtonian Science with a reductionist approach, where the various parts of patient care activities were analyzed and split into different caregiver roles to affect the whole, such as occurred with the nationally spread patient focused care initiative in the early 1990's (Seago, 1999).

However, by using the tenets of complexity science, Wiggins (2008) suggests a new approach might be brought to nursing using the frame of patient care as part of a living and changeable network of interdependent relationships, termed in complexity science as a complex adaptive system (CAS). In the CAS of the nursing unit, the whole is greater than the sum of the parts and it is the web of relationships which lead to improved decision-making in patient care (Gambino, 2008). From an organizational perspective, a CAS responds best to local, distributed control in which outcomes emerge from self organization or adaptation, highly dependent on the relationships between the agents involved and the context of the situation, rather than merely on a central organizational strategy or the sum of the resources and skill available within the group (Zimmerman, Lindberg & Plsek, 2008). In addition, complex adaptive systems learn new strategies from experience, their actions being shaped by their history. This framework offers a unique context for the development of new approaches to patient care models focused at the bedside. The clinical mentor role creates a mechanism to support a complex adaptive system. This model provides an expert at the bedside who is ingrained in the context of the unit and the interrelationships of the various caregivers, to help provide the focused, local adaptations necessary to ensure quality (Burritt, Wallace, Steckel & Hunter, 2007).

Purpose of the Study

The purpose of this study is (1) to examine the long-term impact of a new care model, instituting a clinical mentor program, on nurse-sensitive patient outcomes, specifically failure to rescue and hospital acquired pressure ulcers, and (2) to explore the process by which patient outcomes are affected. The specific aims to be addressed are to:

Aim1. Examine the effect of the clinical mentor program care model on patient outcomes, specifically the hospital wide failure to rescue rate and hospital acquired pressure ulcer rates, longitudinally over a 3 year period.

Aim 2. Explore how the use of experienced nurses in the role of clinical mentor on patient care units serves as a safety net for the oversight of patient care and the improvement of patient outcomes and

Aim 3. Gain an increased understanding of the processes affecting positive patient care outcomes.

Implications for Nursing Practice, Education and Research

This study will add to the body of knowledge needed to create evidence-based changes to nursing practice at the bedside, in order to achieve the substantial reform in healthcare called for today. In the quest to redesign the patient care model, viable approaches must result in measurable patient outcomes improvements. This study will help make that link in practice and has implications for guiding educational efforts to prepare a nursing workforce to perform in a complex adaptive system. In addition, research in this area is difficult and has not been widely attempted; this study can help identify approaches to these questions that will be useful in further studies. Much needs to be done in the area of nursing's affect on patient outcomes if we are to be at the forefront of the national debate on healthcare reform.

Chapter 2

Review of the Literature

The clinical mentor program was designed to bridge the nurse expertise/patient need gap described in chapter one. The elements of this gap need to be better understood if we are to design safeguards to create the bridge for this gap and thereby reduce patient risk and achieve better patient outcomes. This review outlines the expert and non-expert literature which helps to inform the gap, describes the theoretical basis behind using a clinical mentor to bridge the gap, and looks at the effect of expertise on patient outcomes.

Nurse Expertise / Patient Need Gap at the Bedside

Non-expert and Expert Practice

Little is described in the literature specifically addressing the nature of the RN expertise/patient need gap and no studies have looked at the effect on patient outcomes of filling this gap. But there is a large body of work which has examined expert and non-expert practice in terms of how thought is oriented and how decisions are made. Non-expert practice has been described as having a task orientation (Ebright, Urden, Patterson, & Chalko, 2004; Hanneman, 1996), being rule-based and nurse-oriented (Cone & Murray, 2002; Lauri & Salantera, 1995). Treatment decisions of the non-expert nurse are based on isolated cues (Grossman & Wheeler, 1997) and the assessment of a situation

in terms of equally relevant pieces of data, as opposed to putting together salient facts and seeing the big picture, more intuitively (Benner, 1983).

Experts think differently and their decision-making is a function of the way the experienced RN sees the situation and incorporates the salient data points into effective actions (Jasper, 1994). The expert has the ability to ask the right questions to draw out patient information (Cone & Murray, 2002), and to identify highly relevant cues, recognizing trends and patterns when assessing a situation (Grossman & Wheeler, 1997), which results in greater diagnostic accuracy than that of novices (Reischman & Yarandi, 2002). Identified attributes of expert care include a focus on the patient (Radwin, 1998), the ability to truly listen (Cone & Murray, 2002) and the ability to provide concise communication to others (Jasper, 1994).

Non-expert practice was identified as dissociative, where the nurse demonstrated a lack of presence, even when physically with the patient. (Hanneman, 1996). The non-expert tended to perform an unfocused assessment outside the context of the patient's presentation and readily referred traditional nursing activities to ancillary disciplines. The practice was dependent in nature, relying on rules, orders, policies and procedures over judgment, and was guided by a strong task orientation. The resulting patient outcomes identified were preventable complications, incidental recovery and the dehumanization of care. Risk was increased by non-expert practice, which relied on routine monitoring and lacked preparation for potential emergencies. In addition, care was thought to be dehumanized, as the non-expert focused on task completion and the treatment of data numbers, rather than assessing the patient's response to care in light of their longer term recovery. The reliance on the numbers kept them from picking up on subtle cues prior to

clinical deterioration. These characteristics of non-expert practice were similar to those noted by the clinical mentors in the practice examples described below in personal correspondence.

Experts, on the other hand, differentiated themselves from non-experts with their presence, focused assessments, decisive action and patient-outcome orientation (Hanneman, 1996). They demonstrated a gestaltic nursing process that took advantage of practice independence, to achieve patient outcomes. Experts trusted their physical assessment skills, even when not supported by the data from technology. The experts were also willing to stretch traditional boundaries, such as re-intubating a patient in distress from esophageal intubation, rather than waiting for the physician.

Who are the Nurse Experts?

Jasper (1994) synthesized the literature addressing the concept of expert as it is used in nursing. The author pointed out that expertise is difficult to define and measure, yet it is an observable phenomenon. She identified four common criteria associated with the term expert. A nurse must possess a specialized body of knowledge and skill, which comes from both formal education and informal experience. Even though it was defined that the expert must have extensive experience in the field of practice, the use of the term expert has been described in the literature as occurring anywhere from 18 months to 5 years of experience. Highly developed levels of pattern recognition are evident in the expert, who tends to think in wholes and uses intuitive decision-making. Finally, the expert must be recognized as such by others, satisfying some external validated criterion, either by exam, observation or reputation, by those qualified to judge. Jasper also described the phenomenon of cunning, defined as experts manipulating situations using

rules of their own making. Experts think differently, merging knowledge, skill and experience for a result beyond what can be achieved by simply merging theory with practice (Jasper, 1994). The expert identifies critical, important information and associations when assessing a situation, resulting in a simple structure for decision-making, as opposed to the complexity of the novice's myriad data points. This enables their concise communication to others. The description of expert in the literature mirrors the qualities aimed for in the clinical mentor and the level of practice required today with sicker patients using higher technology interventions in a short stay environment where error in care is not reimbursed.

The Development of Expert Decision-Making

There are differing views over how this expert decision making develops. Benner's (1984) seminal work identified a progression of different levels of expertise over time, from novice to expert, culminating in an intuitive, gestaltic grasp of situations. The hallmark description of expertise in the Benner model is the development of pattern recognition, from multiple encounters with patients over a period of years, continually adding to a theoretical background of abstract knowledge. Benner (1984) evaluated the Dreyfus Model of Skill Acquisition for its applicability to nursing, using interviews and participant observations of 67 nurses and nursing students, from six different hospitals. The novice nurse begins with abstract knowledge and uses rules, outside of context, to perform tasks. As a nurse grows along the continuum to competence, the ability to see actions in terms of long range goals is developed. The movement to expert level of practice comes from utilizing past experiences to guide practice, instead of rules and guidelines. The expert develops the ability to see situations from the overall picture,

eventually achieving an intuitive grasp of a situation. Those critiquing Benner's work argue that this gestalt requires a foundation in empirical research and clinical assessment based on explicit criteria, not the intuition purported by Benner (English, 1993). In addition, Hanneman (1996) found no relationship between a nurse's level of advancement in practice expertise and their years of experience or educational preparation.

Pyles and Stern (1983) described the expert practitioner's use of a gestaltic nursing process as a matrix operation, linking basic knowledge, past experiences, patient cues and the nurse's "gut" feelings, processed through categorization and differentiation, to determine a nursing diagnosis on which to act. Experts size up a situation in a glance, with a fully integrated sense of the whole, but this expertise is grounded in a sound educational knowledge base, using skilled assessment, which has been developed from experience. Experts are differentiated from non-experts by their observational ability, which is learned from a more experienced mentor. However, for this expertise to develop, a nurse must have timely access to a mentor RN, who has both the expertise and approachability to share that expertise.

Bonner and Walker (2004) added the phenomena of blurring the boundaries of accepted nursing practice, as a significant feature of expert practice. While they agreed with Benner that experience is essential to the development of expertise, they note that experience alone does not produce an expert, but that that experience must be built in a distinct field of specialization. The expert nurses they studied blurred formal boundaries of practice by engaging in the traditional medical domain of prescribing medications, as well as ignoring the informal boundaries of the workplace by making a professional

patient visit and taking action when off duty. This study was limited to a small sample size, in one specialized renal unit in Australia, and may not describe practice in the general nursing population.

Alternatively, decision-making strategies have been described as existing on a cognitive continuum based on the specific task at hand, from a linear, sequential process often applied by the novice, to an intuitive, clustering process developed from experience in a given setting (Thompson, 1999). On one side of the continuum, the hypothetico-deductive model describes a linear, sequential process to gather information, generate hypotheses, interpret cues, and weigh the pros and cons of the options. This is the format most often used by novices. On the other side, the intuitive-humanist model makes use of knowledge as a whole, and is regularly deployed by experts, who show greater efficiency and clustering of information, developed from experience in a given setting, rather than the progression of different levels of expertise described by Benner. Thompson argues that experts will use the full continuum of strategies, depending on the task complexity, ambiguity and how the situation presents. Harbison (2001) identified a risk associated with hypothetico-deductive reasoning she called anchoring, where the nurse remains with the original hypothesis generated in a situation, despite incoming contradictory evidence.

Determination of which end of the continuum to use depends as well on the experience of the nurse and the context of the nursing situation (Lauri et al., 2001; Lauri & Salanterä, 1995). A series of international studies from Finland looked at decision making in nurses, based on the Dreyfus model of skill acquisition (Lauri et al., 2001; Lauri & Salanterä, 1995). Increased knowledge and experience trended with more systematic data acquisition and greater accuracy in diagnosis. Educational level alone,

did not explain decision making ability. Their work supported that of previous authors, revealing that decision making models of the expert and novice are clearly distinguishable. The novice used an analytical, step by step process, and was nurse-oriented. More experienced nurses were patient oriented, and engaged in forward reasoning, where problems and interventions were considered in unison. All new data, along with the earlier knowledge gained from interacting with the patient were incorporated together into the plan for care.

Grossman and Wheeler (1997) studied how nurses used and grouped cues. Experts recognized the need to establish trends and patterns, rather than respond to isolated cues. They tended to make decisions using multiple cues including their memories of past patients with similar cues. Experts were also more involved with their patients and demonstrated the ability to truly listen. Reischman and Yarandi (2002) found that the experts had greater diagnostic accuracy because they were able to quickly focus on highly relevant cues, matched with a cohesive pattern of domain-dependant knowledge, gained with experience.

Radwin (1998) described the attributes that developed with experience as being a focus on the patient, confidence in practice and knowledge of the antecedents and consequences of similar patient situations. These three attributes enhanced the individualization of nursing interventions by a greater focus on salient areas, more attention to the patient than to the nurse's needs, and the ability to actively listen to the patient and take their preferences into account. Experienced versus inexperienced nurses differed in the types and amount of information gathered during the diagnostic process and the amount, cognitive complexity, and level of detail of the alternatives generated.

Clinical Mentor Descriptions of Nurse Expertise/Patient Need Gap

Personal communications, from the expert observations of the clinical mentors in the program which is the focus of this study, have validated that the nurse expertise/patient need gap at the bedside seems to be a function of the characteristics of expert and non-expert practice as found in the literature review (Clinical Mentors, personal communication, March, 2007). Prior to this literature review, an informal analysis of near miss narratives from active clinical mentors, along with risk management reports and personal experiences, was conducted to look for themes present when the gap exists. (Steckel, 2007). Seven categories emerged.

(1). A task focus. An RN had difficulty obtaining a urine sample from a patient's foley catheter. The mentor was asked to assist and was able to assess that the patient was developing acute renal failure and, in fact, had no urine output at all.

(2). Centering on isolated cues, as opposed to evaluating the patient's response to treatment and situations. For example, when assessing a cancer patient who had a low platelet count and was at risk for bleeding from a Coumadin excess, the novice nurse focused on a 20 minute episode of nasal bleeding as an independent event. The expert nurse described the patient as pale, with a scared, wide eyed expression, stating he was not feeling well and was able to put all the cues together to identify a patient with significant bleeding.

(3). Being nurse oriented, as demonstrated by identifying an inappropriate skin risk level, due to concentrating more on completing the risk tool numbers than fully assessing the patient.

(4). A rules based approach. An elderly patient, who was left in a leg immobilizer for an extended period without removal, because the nurse didn't think that removal was allowed.

(5). Missing subtle cues, for example, confusing oxygen deprivation from agitation.

(6). Missing the big picture, such as not starting prn ordered medications until a newly admitted detox patient actually exhibited tremors.

(7). A final theme that emerged was that of bias. A delay in treatment for an esophageal problem occurred while ruling out a cardiac cause, mainly because the patient was situated on the telemetry unit.

Contrasting examples of scenarios where there was no gap included more of a patient focus, with actions geared toward the long term improvement of the patient. Nursing interventions were used to decrease a patient's risk of skin breakdown and then communicated to the other members of the health care team. Pain control was achieved as part of a plan, rather than an incident response to acute episodes of pain. Consistently high blood sugars in one patient were addressed with the physician and the decision was made to decrease the sugar content in the peritoneal dialysate. These themes begin to create a picture of the nurse expertise/patient need gap which parallels the nursing literature on expert practice and clinical decision-making. A comparison of the expert and non-expert practice themes is highlighted in Table 1.

Table 1

Comparison of Nurse Expertise/Patient Need Gap in Practice Examples With Themes of Expert and Non-Expert Practice in the Literature

Nurse expertise/patient need gap - themes from Practice	Non-expert Practice in literature	Expert Practice in literature
Focus on task	Task orientation	Patient outcomes oriented
Missing subtle cues	Equal relevance to cues	Focused assessment
Missing the big picture	Dissociative Process	Gestaltic nursing process, intuitive
Not evaluating patient responses	Context free	Context bound
Nurse-oriented	Nurse-oriented	Patient oriented
Rules-based	Rules-based, dependent practice	Pattern recognition, independent practice
Bias	"Anchoring"	
	Variable presence	Presence, humanizes care
	analytical	Reflection on action

Research gaps

These studies on expert practice are all qualitative studies interviewing or observing nurses at work, generally on one or two units, with small sample sizes, and are geared at understanding the process attributes of expertise in nursing. Expert nurses were generally described as having over 5 years of experience, with one study using 2 years of experience, and were identified as experts by managers or peers. Most studies were carried out in the critical care setting. Outcome measures were not studied directly, but identified as perceptions of participants or case examples noted in observations. There is a sparsity of literature on the measure of actual patient outcomes in the presence of a unit-based expert, and those too, are qualitative.

The Effect of Expert Practice on Outcomes

Hanneman (1996) conducted one of the few studies which looked at expert and non-expert practice to try to understand its effect on patient outcomes. Her qualitative

research followed 27 nurses in a medical ICU to study how practice advanced, in the presence of a unit-based clinical expert. She concluded that expert and non-expert practice are substantively different, and result in different patient outcomes, with expert practice having the effect of preventing complications, leading to purposeful recovery and was demonstrated by humanistic care. The author's concluding remarks identify the challenge for nursing as increasing the critical mass of nurses who practice at the expert level and suggest that using a unit-based expert as a catalyst is a critical means of accomplishing that challenge.

The effect of non-expert practice was studied with 8 novice nurses involved in near miss events, using the human performance factors framework to guide qualitative interview techniques (Ebright, Urden, Patterson & Chalko, 2004). Nine themes emerged in this work. The novices used critical thinking, but lacked the total picture that would have clarified the situation. They all reported seeking assistance from experienced nurses and being influenced by the unit norms for workflow. These norms included the need to have particular tasks completed by a certain time which added time pressure and led to missing important checks. Working with a particular patient, or piece of equipment, for the first-time was a factor in most events. Hand-offs, without the appropriate communication, led to other events. Both peer pressure and the importance given to other staff members' opinions about the novice had influenced their decisions. Finally, the theme of one novice asking another novice for assistance affected the quality of the information obtained.

Influencing the Development of the Expert Level of Care

Methods for influencing the development of the expert level of care have been described in the literature as well. Activities fall under three general categories, the use of an expert guide (Ebright, Urden, Patterson & Chalko, 2004; Hanneman, 1996), reflective practice (Dewar & Walker, 1999; Downey, 1993; Nelson, Apenhorst, Carter, Mahlum, & Schneider, 2004; Paget, 2001; Radwin, 1998; Tanner, 2006), and role modeling or mentoring (Benner, 1983; Haag-Heitman, 2008; Pyles & Stern, 1983; Roche, Morsi & Chandler, 2009). These are the hallmarks of the clinical mentor program strategies, using an expert RN to role model and mentor with the use of reflective practice as they oversee care on the unit and monitor patient outcomes.

Use of the Expert Guide

The conversion theory developed by Hanneman (1996) described how exposure to a catalyst for the development of focused assessment, decisive action and outcome orientation, enabled a nurse to move along the continuum, from non-expert to expert, unrelated to years of experience or education. Ebright and colleagues (2004) suggested supporting novice nurses at the bedside by ensuring the consistent availability of expertise in order to fill the gaps in the normal defenses of an organization that lead to near miss situations. Environments need to be created that develop experiential learning in real-world situations, with strategies to recognize and intervene when novices are in error. They further cautioned that realistic expectations of novice decision-making and performance ability were required to enable the appropriate support and this support was critical up to a year post-graduation.

Rather than the role of a unit-based guide, work across the United Kingdom (UK) on practice development has revolved around a more traditional mentor type relationship focused on reflective practice and nurse to nurse support. Tichen (2003 a) created a framework called "critical companionship" to aid experiential learning. The critical companion is described as a facilitator working one on one with nurses on a journey to develop the nurses' practice and help them transform their work culture to become person-centered and evidence-based. They accomplish this transformation using high challenge and high support through role modeling, sharing expertise and reflective practice in regular, generally monthly sessions. She later showed how the framework could also be used by expert nurses, without advanced education or facilitation experience, to develop their skills as critical companions, acknowledging that the development of an expert companion will take several years, progressing along Benner's (1982) novice to expert trajectory (Tichen, 2003b).

The UK National Health Service (NHS) has developed a clinical supervision program (Winstanley & White, 2003) which revolves around experienced practitioners in multiple health care roles providing guidance to their less experienced colleagues in clinical work, also in the form of regular meeting sessions using guided reflection on practice to develop and enhance future practice. The role has evolved from initially aimed at ensuring competence and enhancing consumer protection, to a greater emphasis on the continuing development of practice. Various models have developed to operationalize the clinical supervisor, the most common attending to proactive policy, procedure and standards compliance, skills and evidence-based practice development, and support for practitioners to cope with the stress of practice. The NHS called it a central strategy for

quality improvement from the development of nurses and has implemented it in 92% of all NHS providers in England and Scotland, yet acknowledges they still lack evidence which links the clinical supervisor with patient outcomes.

Latham (2008) describes a mentoring program, titled "Nurses Supporting Nurses", developed as a partnership between the academic world and practice setting, which used a mentor-mentee dyad along with a workforce environment governance board as an infrastructure to support the development of a positive, supportive relational culture among the nurses on a given unit and within the greater hospital culture. The program addressed mentoring as well as team building, communication skills, cultural competency, conflict resolution and time management, as well as patient safety and satisfaction. Mentor teams chose each other, attended two 8-hour education sessions together and worked through regular one-on-one meetings. Mentors were further supported by quarterly follow-up sessions. Outcomes measures showed improvements in patient and nurse satisfaction, nurse vacancy and retention rates, as well as improvements of patient safety in fall, pressure ulcer and restraint use reductions. The authors cautioned that these improvements could not be attributed to the program alone.

Reflective Practice

Work on the benefits of reflective practice point to the potential for a clinical expert role to advance practice at the bedside. The use of a reflective inquiry process in a work-based learning model has been studied as a means to develop practice (Dewar & Walker, 1999) and Radwin (1998) suggested that this learning from experience could be facilitated in a supportive environment, led by more highly experienced nurses. Downey (1993) found that the acquisition of experiential knowledge could be facilitated by direct

clinical experiences, as well as the systematic comparing of cases and sharing of information from expert nurses. Pattern recognition was developed through feedback, precepting, validation from expert nurses and observing how expert nurses make judgments in a number of patient situations. Tanner (2006) noted that reflection on practice is critical for the development of clinical knowledge and the improvement of clinical reasoning. It serves to connect actions with outcomes.

Paget (2001) found that RNs felt reflective practice resulted in wide changes integrated into their daily practice that could have a marked influence on patient outcomes which held over the long-term. He highlighted the key role of the facilitator in this process. Similarly, reflective thinking prompted by a unit expert who is a clinical expert and trusted advocate of novice development, was found to build confidence, critical thinking and experiential knowledge in new nurses (Nelson, Apenhorst, Carter, Mahlum, & Schneider, 2004). The coach used questioning, mental rehearsal, feedback and reflection to promote professional growth.

Mentoring

Benner (1982) noted that by studying proficient and expert nurses, it is possible to see the goals and outcomes possible in excellent nursing practice. She described how the descriptions of exemplars and paradigm cases from the expert could raise the sights of the competent nurse and help them develop toward a higher level of practice.

Pyles and Stern (1983) described the "Gray Gorilla Syndrome", whereby the expert mentor acts in the manner of the silverback gorillas, through leading, teaching, protecting and role-modeling for those under their charge, in this case, novice nurses. This role of the expert was an informal role, based on trust and relationships, and was

correlated with improved working environments for nurses. The role was less effective if the mentors were not accessible, or if they had expertise, but not the qualities needed to share that knowledge. Their conclusion was that the nursing gestalt could be taught through the use of guided experiences, with senior nurses, the "gray gorillas". The senior nurses used role modeling to teach expertise and professional values. By teaching, they imparted the knowledge of subtle patient cues. Through coaching, they guided problem-solving and decision-making. As a leader, they motivated, inspired and influenced the novice to use humanistic approaches. As the protector, they became a support system, building confidence and competence and as the counselor, they help to develop communication and collaboration skills. Furthermore, these senior nurses also affect the patient care environment. Units with "gray gorillas" were quieter, more efficiently organized and became more therapeutic, with less stress on the nurse.

More recently, Haag-Heitman (2008) studied how the attainment of expert performance was influenced by environmental and personal factors, as described by expert nurses. Reported environmental factors included a heavy influence of mentors, especially early in a nurse's career, as well as recognition of their practice by others. Personal factors included an engagement in deliberate practice, where the nurse sought out diverse and dynamic work opportunities with a life-long experiential learning focus. Risk-taking was equally important, where nurses were involved emotionally in their practice and personally responsible for patient outcomes.

Roche, Morsi & Chandler (2009) found that structural work empowerment and work relationships together explained 26% of nurses' reported expertise, in a sample of 115 staff nurses. Structural work empowerment included access to the opportunities,

support, resources and information needed to develop expertise and in experienced acute care nurses, predicted 37% of the nurses' reported work relationships. In the model studied, work empowerment made it possible to establish work relationships with patients, families, peers and mentors, and these relationships were the strongest predictor of the development of expertise, explaining 20% of the model alone ($R = 0.198$). The only nurse characteristic which was associated with nursing expertise was experience in the specialty. No association was found with educational level, total years of nursing experience, or years of experience on the specific unit. The clinical mentor program addressed both work empowerment and work relationships.

Conclusion

The concept of the nurse expertise / patient need gap has been developed within the framework of the literature describing non-expert practice and decision-making. In addition, the use of an expert guide, modeling reflective practice, has been shown to be a useful means of moving the practice of non-experts along the continuum toward an expert level. Research, with a focus on the process of how this growth occurs, as well as a focus on the outcomes that can be achieved in patient care, is needed to help identify and solidify strategies to ensure safe, quality care at the bedside.

Theoretical Framework

Novice to Expert

Benner's (1984) novice to expert model identifies the development of expertise as being a function of experiential learning through pattern recognition. This model anchors the structure of the clinical mentor program. Nurses already demonstrating this level of

expert practice become mentors to expand their influence throughout the unit in order to provide oversight for patient care and help others develop along the expert continuum. Benner's initial work translated the Dreyfus Model of Skill Acquisition into a nursing model that followed the progression of nursing expertise, using interviews and participant observation of 51 experienced nurses, 11 new graduates and 5 senior nursing students in six different hospital settings, from community to academic. Her description of movement from novice level to expert practitioner pointed to the requirement of experience, in addition to formal educational preparation, as a means to develop, observe and understand ways of being and coping with illness beyond theoretical concepts. Nurses' experience helps them to discern the nuances and subtle differences in the clinical variations of actual patient care, continually refining their initial understanding. She described the use of reflection and exemplars of paradigm cases as a means for nurses to learn from the experiences of others to help them move along the continuum of development.

Theory of Conversion

Hanneman (1996) developed the theory of conversion, which described the use of a unit-based clinical expert as a catalyst to improve the practice of others and affect patient outcomes. The original qualitative field research explored nursing practice and outcomes using grounded theory methods, consisting of 6 months of participant observation and unstructured interviews with 27 nurses and 31 patients in one 10 bed medical intensive care unit in a large teaching hospital. Over the course of the study, she noted that 70% of the non-expert nurses began to exhibit initial steps to the expert practices of more integrated and interdependent nursing processes. The others continued

with dissociative and dependent practice. The author determined that this study refuted Benner's contention that practice experience alone leads to expertise, and suggested instead that both active work and a catalyst are needed.

The conversion theory states that when a non-expert is exposed to a unit-based expert, who willingly transmits contextual knowledge, the nurse advances, unrelated to years experience or education. This process takes active work on the nurse's part and requires a beginning level of presence. Presence is demonstrated as physical presence at the bedside, social presence in interaction with the patient and expert, and emotional presence for engagement in learning. With a catalyst for the development of focused assessment, decisive action and outcome orientation, the nurses moved along the continuum, from non-expert to expert, continually redefining their boundaries. This theory helps describe the process used in the clinical mentor program and identifies that improved patient outcomes can be expected.

Critical Companionship Framework

Tichen (2003 a) outlined the components which make up the facilitation of experiential learning in her critical companionship framework. The framework describes the relationship between the critical companion and their mentee (which mirror the clinical mentor and nursing staff) as one of partnership, reciprocity, knowledge of where the mentee is in their development, and graceful support. The critical companion is an expert guide who facilitates others to achieve person centered and evidence based practice. The companion acts in a deliberate, timely manner to identify what matters in a situation and to strategize what aspects to address. Four processes are engaged. Consciousness raising and problematisation bring to awareness and make explicit the

nurse's daily practice patterns, understanding of routine practices, behaviors and knowledge and how they effect the care given. Self reflection and facilitator led critique helps evaluate the nurses' experiences, thinking and intuition in order to achieve deeper understanding and gain new knowledge from which action plans for future practice can be developed. This is done through articulating the craft knowledge of the expert, observing, listening, questioning, role modeling, providing feedback on performance, challenging, critiquing and supporting. The author suggests this framework provides practical principles for others to develop their own unique forms of critical companionship. This framework is a useful depiction of the clinical mentor relationship with the nursing staff.

Complexity Science

Complexity science offers a framework to describe the environment of the hospital unit within which the mentor program is situated and how this program is well suited to that environment. The most common grounding of practice and research in medicine and health care lies in the Newtonian concept that the whole is the sum of the parts (Lindberg & Lindberg, 2008). The approach of reductionism is used whereby the heart specialist takes over the cardiac care and the lung specialist monitors the respiratory tract. The nursing approach called patient focused care in the 1990s is an example where the various tasks of nursing care were disassembled and it was determined which belong to the nurse and which do not, in order to maximize the appropriate use of resources (Seago, 1999). For instance, actually emptying a foley catheter bag clearly did not require nurse expertise. Yet, the act of emptying the foley is accompanied by the assessment of

urine color, amount and odor which are an integral part of the full patient assessment and subsequent plan for care.

A complexity science viewpoint applied to healthcare frames the hospital arena as a complex adaptive system (CAS), which is an interdependent dynamic, ever-changing environment (Zimmerman, Lindberg, & Plsek, 2008). Complex denotes a diverse number of connections between the wide variety of agents involved in a hospital. Adaptive speaks to the ability to change and learn from experience, while the system is the set of the interdependent elements which make up healthcare. In a CAS, the whole is greater than the sum of the parts and it is the web of relationships between the various agents involved which lead to improved decision-making in patient care.

Complexity science acknowledges three levels of problems (Lindberg & Lindberg, 2008). Simple problems are those that can be solved by following recipes, they are straightforward, do not require high levels of expertise to result in successful resolution if predetermined steps are followed, such as following a procedure for placing a foley catheter. Complicated problems are made up of subsets of simple problems, but can not be broken down into those simple components. These require specialized expertise to solve, but can be solved by experts with high levels of knowledge and experience using preexisting formulas. When managed by the experts, outcomes can be predicted with high level of certainty. This describes the scenario of a basic nurse patient assignment made up of stable patients. Complex problems, however, have a level of uniqueness, needing to be approached and understood individually, inherently holding a high level of uncertainty with unpredictable outcomes. Solutions cannot be assured through simply applying known formulas and expertise and experience do not always

ensure successful resolution. These complex problems are seen regularly on nursing units in unstable patients and those with complex multiple morbidities or home/family situations, or when trying to manage complicated problems in the high turnover environment.

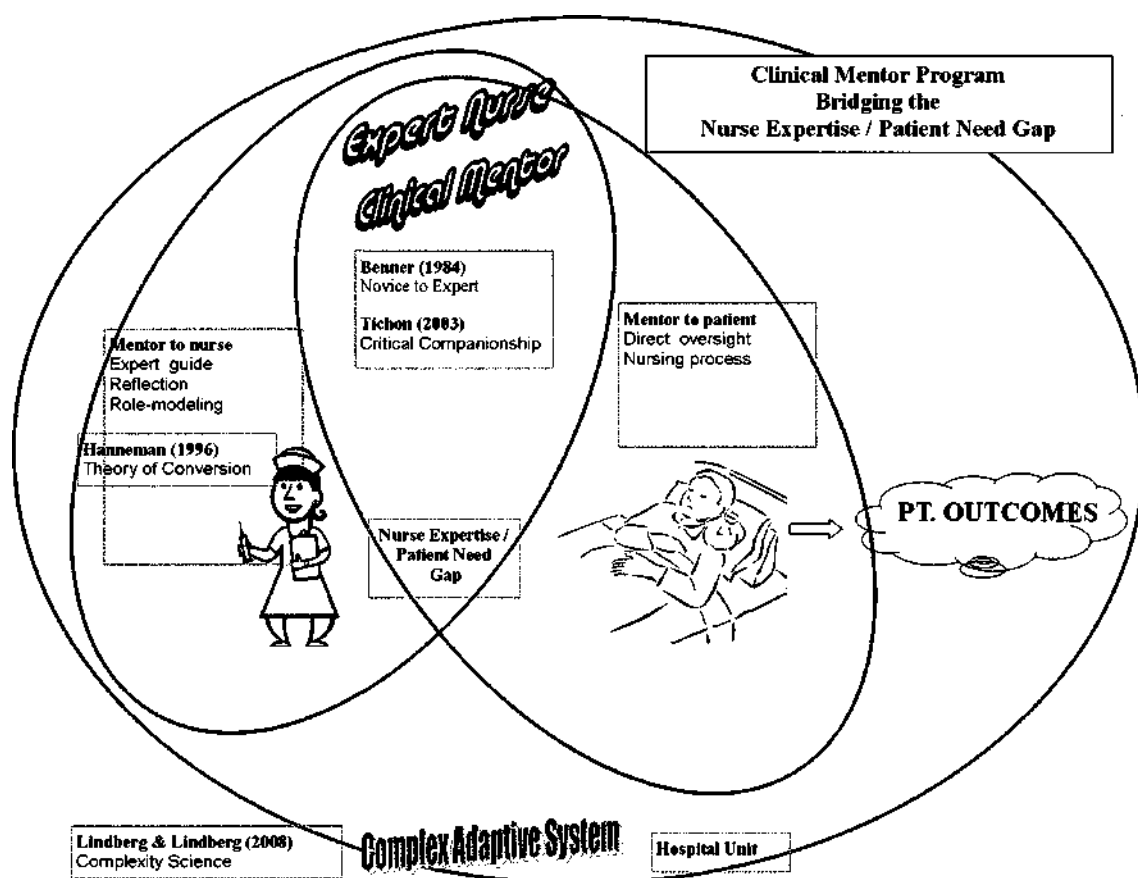
Organizationally, the CAS responds best to local, distributed control (Zimmerman, Lindberg & Plsek, 2008). With local control, the results obtainable are stronger than that possible from a sum of the resources and skill within the group or as opposed to control from a central strategy or policy making hierarchy. Local control allows for collaborative and creative problem solving from the diverse and interdependent staff on the unit. Outcomes in a CAS emerge through self-organization as new strategies are learned and applied from experience, with history shaping the actions taken. It is the relationships between individuals that is more critical than the individual themselves. The clinical mentor program works off this local control, where mentors have developed the web of relationships and expertise in the context of a given area that enable them to adapt to new challenges. The interactive, expert mentor is well suited to navigating the numerous and diverse parts of the healthcare system in order to provide the flexible problem solving needed in a complex adaptive system under constant change.

Theoretical Framework of the Clinical Mentor Program

Together, these mid-level theories provide the framework for the clinical mentor program. The expert nurse, as defined by Benner (1984), works within a complex adaptive system, as defined by Lindberg & Lindberg (2008), to provide local, adaptive control for the oversight of patient care. The mentor provides direct observation, assessment and intervention as necessary directly to the patient, but primarily works

alongside the bedside nurse to bridge the nurse expertise/patient need gap. In the role of expert guide, the mentor uses reflection and role-modeling to achieve conversion of the non-expert toward expert practice, resulting in improved patient outcomes (Hanneman, 1996). Tichon's (2003 a) framework of the critical companion identifies components of the mentor's work both independently and as an expert guide to achieve person-centered and evidence based care. The interaction of these theories is pictured in Figure 1.

Figure 1. The Clinical Mentor Program Theoretical Framework.



Nurse-Sensitive Measures

Measuring effectiveness in healthcare dates back to Florence Nightingale (1820-1910), when she tracked the relationship between clinical interventions and their related outcomes. Her work led to decreased British Army death rates from 42% to 2% during the time of the Crimean War (Hill, 1999), and earned her entry into the British Statistical Society as their first woman Fellow (Florence Nightingale Museum Trust, 2003). Later, Ernest Armory Codman, MD (1869-1940) made the statement that "Every hospital should follow every patient it treats long enough to determine whether the treatment has been successful, and then to inquire 'if not, why not' with a view to preventing similar failures in the future." (Enerson, 2006). The Codman Award, which bears his name, is given by the The Joint Commission (TJC) to reward the use of process and outcomes measures to improve organization performance and quality of care.

The American Nurses Association formalized the measurement of nursing quality through the Nursing's Patient Safety and Quality Initiative (ANA, 2007) which resulted in the publication of the Nursing Report Card for Acute Care Settings (ANA, 1995). The Nursing Report Card was based on Donabedian's structure-process-outcomes theoretical framework and examined the linkage between nursing care and patient outcomes (ANA, 1995). Twenty-one indicators were identified as having strong conceptual ties to the quality of nursing care, of which ten were considered core measures. Structural elements included staff and contracted RN hours per patient day and skill mix. Process indicators were defined as nurse satisfaction and pressure ulcers. Outcomes indicators included falls, nosocomial central line infections, and various patient satisfaction measures. A follow-up to this report card in 1997 added length of stay, pneumonia, post-op and

urinary tract infections to the list of indicators and correlated the outcomes with staffing levels (ANA, 1997).

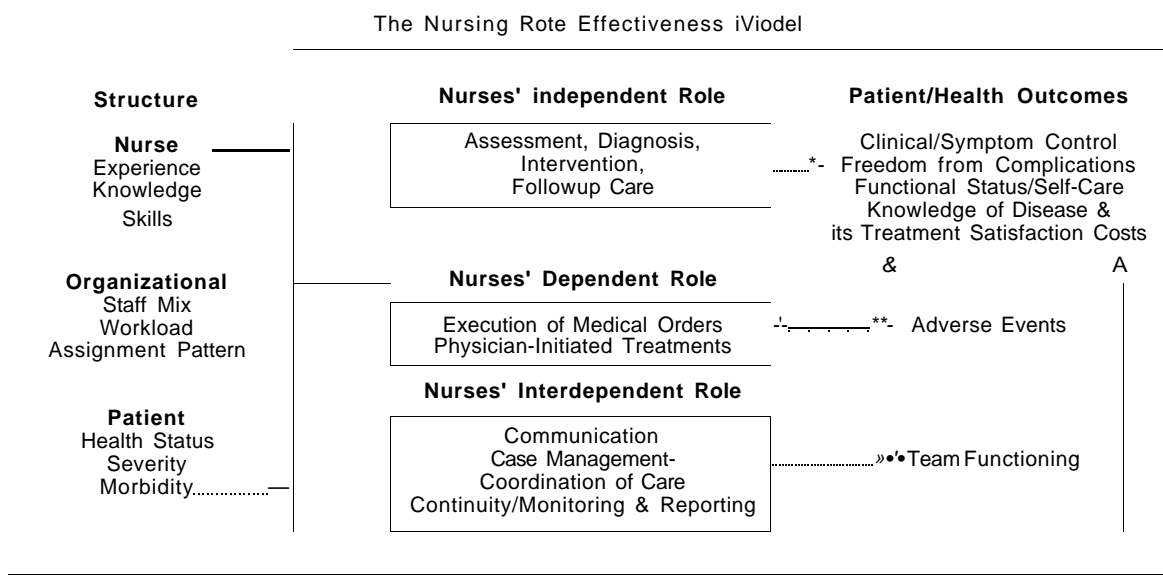
Because outcomes measurements were highly dependent on the quality of available data, the California Nursing Outcomes Coalition (CalNOC, 2006) was formed in 1996 to establish a valid and reliable statewide nurse-sensitive outcomes database, conduct research and influence policy, education and practice. The original CalNOC indicators were selected from the 21 elements in the ANA report card and aligned with the National Quality Forum (NQF) strategy for measuring and reporting healthcare quality. The national equivalent of this repository was created in the following year as the National Database of Nursing Quality Indicators (NDNQI) (Gallagher & Rowell, 2003). Linda Aiken was one of the leading nurse researchers to put these emerging databases to use in large, multi-state research studies, to show that the relationships between structural elements such as nurse staffing and education with patient outcomes are measurable (Curtin, 2003). To date, empirical studies of nursing's influence on outcomes has centered on staffing, RN hours of care and education, as other nursing workforce characteristics have not been as easily available for data abstraction (Dunton, Gajewski, Klaus & Pierson, 2007). Experience and expertise are among the additional characteristics Dunton and colleagues (2007) called for to be included in nursing workforce data.

Nursing Outcomes Measurement Model

In 1998, the Nursing Role Effectiveness Model was developed to place Donabedian's framework in the context of nursing (Irvine, Sidani, & McGillis, 1998).

This model defined how nurse, organizational and patient characteristics interacted with the nursing role processes to affect patient outcomes. (See Figure 2.)

Figure 2. The Nursing Role Effectiveness Model¹



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National Consensus Standards for Nursing-sensitive care

Ongoing work from both the Agency for Healthcare Research and Quality (AHRQ, 2003) and the National Quality Forum have collated and further refined the measurement of nursing quality, resulting in the NQF (2004) publication of the first set of national standardized performance measures for nursing in acute care hospitals. The fifteen outcome measures chosen were taken from CalNOC, NDNQI, and TJC as well as from the Centers for Disease Control (CDC), the Centers for Medicare and Medicaid Services (CMS), and Linda Aiken's work in the nursing literature. Those identified include hospital wide measures of failure to rescue, pressure ulcers, falls prevalence and injury, restraint prevalence, smoking cessation counseling, and the Practice Environment

Scale of the Nurse Work Index survey (PES-NWI). Additionally, intensive care unit measures of catheter associated urinary tract infections, central line blood stream infections, ventilator associated pneumonias are included. The NQF increased the significance of these measures by suggesting that they could be used by consumers to judge nursing care in hospitals, by providers to drive performance improvement, and by purchasers to financially reward hospitals with higher performance (NQF, 2004). Therefore, these nurse-sensitive indicators have already been named an important measure of nursing quality, yet how nurses influence some of these indicators, especially newer ones such as failure to rescue rates, is not well known. The outcome measures of failure to rescue and hospital acquired pressure ulcer rates were the two patient outcomes to show statistically significant improvement between two time periods from 6 months prior to adopting the clinical mentor model and 6 months post-implementation (Burritt, Wallace, Steckel, & Hunter, 2007). Therefore, they are the outcomes which will be followed over time in this study.

Failure to Rescue

Definition of Failure to Rescue

The outcome measure labeled "failure to rescue," was initially described in the literature in 1992, defined as a patient death following a complication. (Silber, Williams, Krakauer, & Schwartz, 1992). Subsequent refinement has led to the current NQF (2004) definition of death among surgical inpatients with treatable serious complications (sepsis, pneumonia, gastrointestinal bleed, shock/cardiac arrest, deep vein thrombosis/pulmonary emboli). The primary procedure must be done within two days of admission, and neonates, newborns and patients transferred from nursing homes are excluded. Studies

have shown that as high as 15% of patients admitted to hospitals experience a complication, of which over 50% are preventable. (Tourangeau, Cranley, & Jeffs, 2006). Among Medicare patients hospitalized from 2001 through 2003, there were 198,793 failure-to-rescue incidents (Schmid, Hoffman, Happ, Wolf, & DeVita, 2007). Failure to rescue events have been described in the literature as averaging 18.6% in medical pts and 19.7% in major surgery patients (Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002).

Development of the Failure to Rescue Measure

The original failure to rescue studies suggested that this indicator is a more powerful tool than the more commonly used, risk-adjusted mortality rate to detect true differences in patient outcomes linked to hospital care itself. (Silber, et al., 2000; Silber, Rosenbaum, & Ross, 1995; Silber, Williams, Krakauer, & Schwartz, 1992). Previously, it was assumed that if a hospital had a low death rate, they also had fewer complications and were better at rescuing those patients that developed complications. The authors hypothesized that in general, common, uncomplicated surgical procedures are performed within established standards and methods across different hospitals, making it more likely that differences in complication rates would be a result of patient characteristics presenting on admission. However, once those complications occur, the ability of the hospital structure to respond and intervene may vary, offering a measure of quality more sensitive to variation among hospitals. Their study results showed that the mortality rate was associated with both hospital and patient characteristics. Yet, the complication rate was associated more with patient characteristics and the death rate after complication (failure to rescue) was associated more with hospital characteristics, as predicted. They

explained that failure to rescue as a measure was significant because it looked at a relatively homogenous subset of patients, since each had a significant problem (complication). Therefore, it has the advantage of measuring hospital performance with challenging patients; however, it is limited by the fact that a relatively small number of such incidents occur per hospital and service. This measure also relies on the accurate identification of complications, which can be subjective.

The series of studies by Silber and colleagues (1992, 1995, 2000) broke new ground by defining this indicator linked to hospital care itself. While the studies had extremely large total sample sizes, the actual number of patients per hospital was small and the data used were administrative hospital wide data, which carry the risk of coding and reporting errors and inconsistencies. The adverse events were well chosen to ensure that 95% of the hospital deaths followed a complication, while 80-90% of the total patients in the hospital did not have a complication. Their list of 19 potential complications included some of which are more likely to result in death, such as Pulmonary Emboli, than others, such as simple arrhythmias. The researchers did attempt alternative analyses to assess this distribution effect and found no bias. The studies had progressively larger and broader patient samples, more varied diagnoses and broader indicators to help refine the concept of failure to rescue. They concluded that complication rates measured different information than mortality or failure to rescue. In addition, they established the premise that failure to rescue was the indicator most sensitive to hospital characteristics as opposed to patient characteristics and thus a reasonable indicator to note variation in hospital quality.

The only nursing element tested in this series was the ratio of RNs to hospital beds and findings showed the higher the ratio, the lower the failure to rescue rate, but also the higher the complication rate (Silber, et al., 2000). However, this ratio could be driven simply by the number of ICU beds in the hospital, which have the lowest ratios, as opposed to differences in structural support for nurse staffing. When analyzing their finding of lower failure to rescue rates in high technology hospitals versus low technology hospitals, Silber and colleagues (1992) suggested that this may reflect unmeasured characteristics such as monitoring capability or the experience of the nursing staff. Though published in 1992, the first two studies used 1985 and 1990 patient care data, at the beginning of managed care changes, which may decrease its translation to the current healthcare environment.

Nursing and Failure to Rescue

Nursing studies have linked nurse staffing and level of education (Aiken, Clarke, Cheung, Sloane and Silber, 2003; Aiken, Clarke, Sloane, Sochalski, & Silber, 2002) as well as higher RN skill mix (Needleman, Buerhaus, Mattke, Stewart & Zelevinsky, 2002) to improved failure to rescue rates on a broad scale. Needleman and colleagues (2002) found a relationship existed among medical patients between lower failure to rescue rates and a higher skill mix of RNs. For major surgery patients, there was a strong and consistent relationship between a lower failure to rescue rate and both a greater number of RN and all licensed nurse hours per patient day. The impact of shifting from a low to high RN staffing model resulted in 4-6% improvement in failure to rescue. The relationships did not hold true for mortality rates.

Linda Aiken and colleagues (2002, 2003) reported two large studies from the same sample of 10,184 staff nurses and 232,342 patients from Pennsylvania hospitals in 1998-1999. In the first landmark study, they looked at patients undergoing general, orthopedic and vascular surgeries and found that there was a 7% increase in the odds of failure to rescue for each additional patient assigned per nurse. (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). The measure of mean patient load was averaged for nurses who reported having at least 1 but fewer than 20 patients. The advantage of this study was the direct measurement of bedside nurses. The caution comes from the broad inclusion of patient loads to calculate the mean and the mixing of specialty with general med/surg units in the sample. However, Aiken addressed this with a comment that there is no evidence that including specialty-specific staffing offers advantages in the study of outcomes. They further established that there was no difference when looking at just med/surg nurses versus all staff nurses. Again, while the full sample size was large, there was a small and uneven sample from each specific hospital. In 50% of hospitals, less than 50 nurses responded to questionnaires, with 20% of hospitals having less than 20 RNs respond. Half of the hospitals had the lowest ratios, 5:1 or less, and discharged 65% of patients. High-technology hospitals were only 28% of those studied, but accounted for 55% of the patients discharged. The authors' commented that nurse surveillance around the clock allowed for early detection and prompt intervention when patient's conditions deteriorated. They concluded that the number of RNs available affects this ability for surveillance. (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002).

The second study looked at the educational level of RNs and linked a 10% increase in the proportion of RNs holding a BSN degree or higher, with a 5% decrease in

the odds of failure to rescue, as well as patient mortality. (Aiken, Clarke, Cheung, Sloane & Silber, 2003). The results held true when differences in the other hospital structural elements, patient characteristics, nurse staffing and experience were accounted for. They used the educational degree as a measure of the quality of clinical judgment, seeking to find if this was another key to effective surveillance. The authors suggested that their results went against conventional wisdom which would put a nurse's experience above their educational level as important to the quality of patient care. Hospitals with higher proportions of BSN nurses also had slightly less experienced nurses on average and significantly lower mean workloads. These tended to be larger hospitals, associated with postgraduate medical training programs and a high technology facility. Nurses' years of experience had significant association with mortality before controlling for other patient and hospital characteristics, but were not found to be a significant predictor of mortality or failure to rescue when considered independently. The study was conducted in only one state and used administrative data with the associated potential of coding errors and inconsistencies. (Aiken, Clarke, Cheung, Sloane & Silber, 2003).

Expertise/Vigilance and Failure to Rescue

Beyond the structural elements of the nursing service, failure to rescue has been tied to professional nursing vigilance from experienced nurses as key to improved patient outcomes (Aiken, Clarke, Cheung, Sloane & Silber, 2003; Clarke, 2004; Meyer & Lavin, 2005). Vigilance is defined as the ability to anticipate, recognize cues and react quickly to prevent an adverse patient occurrence. These actions are reflective of an expert level of clinical judgment, gained through experiential learning (Benner, 1983). Clarke and Aiken (2003) note the importance of expertise to discern what needs attention in the patient

assessment. They caution that complications are less likely to be anticipated appropriately or detected in a timely manner on a unit with too few or overburdened experienced nurses. Additionally, clear communication, from credible, experienced nurses, is needed to command the required response. Clarke (2004) identifies the critical role of the experienced nurse as a beneficial resource, a mentor, and a source of clinical memory on the unit, helping to detect problems and intervene timely through the rapid paced high acuity environment of today.

Meyer and Lavin (2005) argued that the reason improved outcomes are associated with having an adequate number of nurses at the bedside, is due to professional vigilance. Vigilance keeps patients out of trouble, first through watchful attention, by a nurse who anticipates potential risks and recognizes and evaluates cues and second, through the ability to react to the danger detected in the event of an occurrence. Evaluation of the patient is derived in the context of the nurse's knowledge, education, and experience which results in the pattern recognition phenomenon described by Benner (1983). The expert nurse, over time and multiple patient encounters, monitors the effectiveness of nursing interventions. By continually adjusting care based on what interventions work in specific situations, the nurse develops the multifaceted knowledge base that Benner described as a characteristic of expertise in nursing. Meyers notes that, therefore, educated, experienced, professional nurses are key for vigilance at the bedside in order to prevent failure to rescue scenarios. Yet there is a gap in current research to connect the experiential learning or clinical judgment of expert nurses to failure to rescue.

Experience and Mortality

Researchers in other countries have added the variable of experience to their studies on nurse staffing and patient outcomes. Canadian researchers found that each additional hospital mean year of nurse experience in their clinical area was associated with 6 fewer patient deaths for every 1000 discharged patients, in urban community hospitals and 4 fewer patient deaths for every 1000 discharged patients in non-urban community hospitals. (Tourangeau, Giovannetti, Tu, & Wood, 2002).

While noting that staffing and skill mix allow for richer surveillance systems, Tourangeau (2005) extended Aiken's work on a mortality model to hypothesize about the effect of experience. She suggested that more years of RN experience within a clinical unit lead to more developed skills in that specialty. This allows experienced RNs to more quickly and accurately detect early complications signs, and to rapidly respond and intervene to rescue the patient and prevent death, than nurses with less experience. Experience also leads to more effective relationships with other health team members, a factor of importance in the hospital characteristics. In addition, more experience on the unit indirectly affects mortality through its affect on improving nurse satisfaction. In her study which tested this theory, three predictors were supported as having direct relationships with 30-day mortality. Those were skill mix, years of nurse experience on the clinical unit, and nurse capacity to work, measured by the number of scheduled shifts of work missed (Tourangeau, Giovannetti, Tu, & Wood, 2002).

Mean years of RN experience were included in a study of nurse staffing variables and in-hospital mortality in Thailand (Sasichay-Akkadechanunt, Scalzi & Jawad, 2003). The ratio of total nurse staffing to patients was the best predictor of in-hospital mortality;

the other three variables, including nurse experience, were found to be related to mortality, but not independently. The study was done with retrospective chart review, yet noted that clinical information was limited. One hospital was analyzed at the patient level, limiting the ability to generalize the results. These international studies raise the question of how experienced nurses might affect failure to rescue rates.

Conclusions from these major studies are complicated by the fact that each study defined the failure to rescue measure differently, by varying on the numbers and types of both patient populations and complications considered. One study assumed all post-op deaths resulted from complications whether or not it was documented. Multi-state studies required judgment when combining data, especially around staffing definitions or what proportion of staff were assigned to inpatient versus outpatient care. Clarke and Aiken (2003) commented that the large database studies provided limited information for many patient characteristics and treatments. They suggested the need for smaller scale studies of patient outcomes, using patient information that's more detailed than what hospitals usually provide to insurers.

Hospital Acquired Pressure Ulcers

Since 1996, the ANA has considered the hospital acquired pressure ulcer rate (HAPU) to be a nurse-sensitive quality indicator (ANA, 1999). The NQF (2004) has since officially endorsed this outcome as a core measure of nursing care performance in hospitals. With the prevalence of hospital acquired pressure ulcers in the CalNOC database averaging 9% (Donaldson, Brown, Aydin, Burnes Bolton, & Rutledge, 2005) and the CMS announcing it will no longer reimburse for this complication, the indicator has taken on significant importance.

Lake and Cheung (2006) reviewed the state of the science linking nurse staffing to pressure ulcers (and falls) suggesting that the nursing role, encompassing surveillance and care, makes nurses uniquely suited to prevent these occurrences. The evidence was equivocal over 7 studies looking at pressure ulcers as associated with staffing levels and mix, varying between unit and hospital level measures. HAPUs were identified from secondary diagnoses in the medical record or during prevalence studies. The authors' suggested that this underscores the point that having more nurses, rather than more of the right ones and in the right environment, does not necessarily achieve better outcomes. There is minimal literature which looks at the potential influences of differences among RNs and practice environments on these outcomes. An earlier systematic review by Lang, Hodge, Olsen, Roman and Kravitz (2004) revealed the same conclusions for pressure ulcers. Blegen and Vaughn (1998) and the American Nurses Association (1997) both showed higher proportion RN skill mix associated with less pressure ulcers. Unruh (2003) found a higher proportion of licensed nurses associated with lower pressure ulcer rates.

The effect of nursing experience on patient outcomes has been studied by Blegen, Vaughn, and Goode (2001). They found that the presence of more experienced RNs was associated with lower fall rates, lower med error rates, increased med error reporting and decreased pt. sat with teaching, using data viewed at the unit level. McGillis Hall, Doran, and Pink (2004) showed less experienced RNs associated with higher wound infections. Neither included pressure ulcers in their studies. The first NDNQI data study to include experience as a nurse characteristic found lower HAPU rates associated with less total nursing hours per patient day, higher RN skill mix and a higher percentage of RNs with

10 or more years of experience (Dunton, Gajewski, Klaus, & Pierson, 2007). The HAPU rate was 1.9% lower for every increase of one year in average RN experience. Further, the effect sizes of experience were larger than those for skill mix.

Definition of Hospital Acquired Pressure Ulcers

The most current NQF (2004) definition for hospital acquired pressure ulcer rate is calculated from the number of inpatients with stage II or greater hospital acquired pressure ulcers over the total number of inpatients in the unit and assessed in the prevalence study conducted that day. Exclusions include patients under age 16, skin breakdown from causes other than that due to unrelieved pressure, and pressure ulcers present on admission. Present on admission means documented on the first day of hospitalization, or if the study was conducted on day 2 of the patient's hospitalization and the stage II ulcer was already present.

Conclusion

This chapter has described the literature identifying the different practice and clinical decision-making characteristics of expert and non-expert practice. This helps to draw the picture of the nurse expertise/patient need gap which is targeted by the clinical mentor program. It has laid out the theoretical framework guiding the program as a viable intervention in the context of today's healthcare environment. Finally, the identification of nurse sensitive indicators was outlined with the specific patient outcomes of failure to rescue and hospital acquired pressure ulcers reviewed in relation to expertise, experience and nursing vigilance.

Chapter 3

Methodology

The purpose of this study was (1) to examine the long-term impact of a new care model, instituting a clinical mentor program, on nurse-sensitive patient outcomes, specifically failure to rescue and hospital acquired pressure ulcers, and (2) to explore the process by which patient outcomes are affected. In this chapter, the methods and procedures are presented, including the design, setting, sample, recruitment procedures, data analysis and human subjects considerations of the study.

The specific aims to be addressed were:

- Aim 1. Examine the effect of the clinical mentor program care model on patient outcomes, specifically the hospital wide failure to rescue rate and hospital acquired pressure ulcer rates, longitudinally over a 3 year period.

- Aim 2. Explore how the use of experienced nurses in the role of clinical mentor on patient care units served as a safety net for the oversight of patient care and the improvement of patient outcomes and

- Aim 3. Gain an increased understanding of the processes affecting positive patient care outcomes.

Design and Methods

A mixed-method embedded descriptive design, as described by Creswell and Piano Clark (2007), using both quantitative and qualitative data was used for the study. Secondary data analysis of patient outcome quantitative data collected both pre and post intervention of a new patient care model was conducted. Qualitative data from interviews of clinical mentors in the program was used to validate and expand on the primary quantitative results, as well as to examine the process of the intervention. Both approaches were conducted concurrently in a single phase, enabling the investigator to frame the patient outcomes measures from two different, but complementary data sources. The data sets were analyzed separately, and then compared and contrasted in the interpretation of results.

There are currently 15 nationally accepted quantitative nursing sensitive indicators defined by the National Quality Forum (NQF, 2004). While these include the failure to rescue and hospital acquired pressure ulcer measures, they are by nature broader level outcomes subject to multiple influences, making the connection to a particular role difficult to establish. Furthermore, much of the literature support in this emerging field of nursing outcomes has derived from large administrative data bases or prevalence studies, suggesting a relationship between nurse education, expertise, structure and subsequent patient outcome measures. Little research has established how those factors and related programs actually serve to improve patient outcomes. Yet a better understanding of the process involved may open up the potential for new and creative approaches to patient care. Therefore, a qualitative approach was added to supplement the measurement of quantitative nursing sensitive indicators expected to be

influenced by the mentor program, to expand our understanding of the results beyond those outcomes easily quantifiable. The resulting analysis helped to identify options for strengthening nurse work processes to close the nurse expertise/patient need gap found in hospitals today.

Quantitative Phase

The quantitative portion of the study consisted of a single group, interrupted time series longitudinal design (Creswell, 2003), using secondary data analysis. This design is useful for identifying quantitative measures of outcomes related to an intervention into a social system, such as the hospital. Measurements of the dependent variables, the hospital wide failure to rescue rate and the hospital acquired pressure ulcer rate, were examined at baseline and monthly for 36 months post intervention.

The independent variable was the intervention of the clinical mentor program. This program utilized the presence of clinical mentors, defined as expert nurses without their own patient assignment, who were responsible for the oversight of patient care quality and served as a catalyst for the development of the nursing staff on the patient care unit. Mentors were hired for their expertise in clinical care, their identification as practicing at the proficient or expert level of Benner's (1983) model, and their strong communication skills. They generally had 5 or more years of experience in their specialty. Mentors were staffed on all shifts, seven days a week, on each patient care unit. A total of 59 full time clinical mentor positions were initially budgeted.

The dependent variable of failure to rescue has been identified as a nurse-sensitive indicator more sensitive to hospital characteristics than patient characteristics (Silber, Williams, Krakauer, & Schwartz, 1992). The disadvantage of this indicator is that it is a

more recent measure, which still lacks a universal description in the literature and is not easily monitored by all institutions. The dependent variable of the hospital acquired pressure ulcer rate has been identified as a nurse-sensitive indicator since the original work by the American Nurses Association (ANA, 1995) to create the Nursing Report Card for Acute Care Settings. Both dependent variables were included in the first set of national standardized performance measures for nursing in acute care hospitals published by the National Quality Forum (2004). These consensus standards were derived from their original development in multiple nationally accepted databases; failure to rescue from Needleman and colleagues (2001) for the Agency for Healthcare Research and Quality (AHRQ), and hospital acquired pressure ulcers from the California Nursing Outcomes Coalition (CalNOC). A preliminary analysis, reported elsewhere, showed a statistically significant improvement ($p < .05$) from baseline to 6 months post implementation in the two measures which were followed longitudinally in this study (Burritt, Wallace, Steckel & Hunter, 2007).

Setting and sample

The study evaluated the clinical mentor program using a convenience sample of all acute inpatients, from one 372 bed hospital in southern California, where the program was created and used on all units. The participating units for this study included five acute medical, surgical and cardiac units, four intensive care units, a post-partum unit and an emergency department. This was a unique program, not described elsewhere in the literature. The investigator was responsible for operationalizing the vision of the Chief Nurse Executive to create a nursing role for clinical oversight of care. Because of this, the investigator had direct access to the subjects and incidents being studied. The

intervention was spread across the hospital and therefore the quantitative outcome measure was the hospital wide statistic of the failure to rescue rate and hospital acquired pressure ulcer rate each month from 10 months prior to and for three years post implementation of the program. In addition, the medical surgical and intensive care unit pressure ulcer rates were examined separately to account for the difference in patient acuity. Patient inclusion criteria followed the NQF definitions for the outcome measures described under data analysis below.

Sample size

Statistical significance for the quantitative segment was determined by the alpha set at .05, considered the norm for social science research (Kerlinger & Lee, 2000). This allowed for a less than 5% probability that results could be due to sampling error. Sample size for the Poisson regression model was calculated using the asymptotic distribution of maximum likelihood estimates of the parameters. The procedure for the calculation of desired sample size has been described by Signorini (1991), and the example given for a similar project with a significance level of 0.5 and 80% power was 406. The number of patients exposed/not exposed to the "treatment" of the clinical mentor would constitute the sample. There were over 1000 patient days in this hospital sample per month, providing adequate power.

Measurement

Participant Characteristics

Data was collected on the groups of RN staff, mentors, and patients for each year, in order to profile the groups for comparison across time in this study. Data collected from RN staff and mentor staff included age, experience (years in practice), educational

level and percent with specialty certification. Patient characteristic data included age, gender (% female), and admission source (% ED admissions).

Dependent Variables

The quality indicators of failure to rescue and hospital acquired pressure ulcers were dependent variables in the study.

Failure to rescue measure is derived from the number of deaths per 1000 patients who have developed specified complications during their hospitalization. The complications included were those identified in the most recent definition by the Agency for Healthcare Research and Quality (AHRQ, 2007) for this measure (pneumonia, deep vein thrombosis/pulmonary embolism, sepsis, acute renal failure, shock/cardiac arrest, gastrointestinal hemorrhage/acute ulcer). Exclusion criteria identified by the AHRQ included the diagnosis specific criteria as well as patients who were neonates, 75 years of age or older, transferred to or from an acute care facility or admitted from a long term care facility.

"Failure to rescue" was initially described in the literature by Silber and colleagues (1992) and defined as a patient death following a complication. The underlying assumption was that hospital performance could be measured not by having fewer complications, but by more effectively rescuing those patients who experienced complications, through quick identification and treatment, as patients deteriorated. This indicator has since been identified as one of 15 patient safety and nurse-sensitive indicators by both the Agency for Healthcare Research and Quality (AHRQ, 2003) and the National Quality Forum (NQF, 2004).

Construct validity was established through the initial series of three large studies by Silber and colleagues (1992, 1995, 2000) which identified this indicator as a more powerful tool than the more commonly used, risk-adjusted mortality rate to detect true differences in patient outcomes linked to hospital characteristics and measures of hospital performance. The authors explained that failure to rescue as a measure was significant because it looked at patients with complications, each having a significant problem, which created a relatively homogenous subset of patients. Therefore, it has the advantage of measuring hospital performance with challenging patients, however, it is limited by the fact that a relatively small number of such incidents occur per hospital and service. These three studies built upon each other, including increasingly higher patient samples from 6000 to over 17,000, while adding younger and sicker patients, with more varied diagnoses. However, the only nursing element tested in their studies was the ratio of RNs to total hospital beds (Silber, et al., 2000; Silber, Rosenbaum & Ross, 1995) and findings showed the higher the ratio, the lower the failure to rescue rate, but also, the higher the complication rate. Additionally, the authors found lower failure to rescue rates in high technology hospitals versus low technology hospitals and suggested that this may reflect unmeasured characteristics, such as monitoring capability or the experience of the nursing staff.

Needleman, Buerhaus, Mattke, Stewart and Zelevinsky (2002) found lower failure to rescue rates associated with a higher skill mix of RNs in both medical and surgical patient populations, as well as with higher RN hours per adjusted patient day. Subsequent nursing studies by Aiken and colleagues (2002) found a 7% increase in the odds of failure to rescue for each additional patient assigned per nurse and linked a 10%

increased in the proportion of RNs holding a BSN degree or higher, with a 5% decrease in the odds of both failure to rescue and patient mortality (Aiken, Clarke, Cheung, Sloane & Silber, 2003). The authors' comments suggested that nurse surveillance might be the mechanism by which more nurses and higher quality clinical judgment allowed for early detection and prompt intervention when patients' conditions deteriorated. The results held true when differences in the other hospital structural elements and patient characteristics were accounted for.

Conclusions from these major studies are complicated by the fact that each study defined the failure to rescue measure itself differently, varying as to which and how many complications were considered. In addition, the use of multi-state administrative data required judgment when combining data, especially around staffing definitions or what proportion of staff were assigned to inpatient versus outpatient care.

Reliability measurements of the proportion of the total observed variation across hospitals related to hospital risk-adjusted performance is moderately high, relative to other indicators, at 66.6% (AHRQ, 2007). The signal standard deviation was also reported as high (0.04617), showing a greater likelihood that hospital characteristics affect this measure. The signal share is lower than other indicators (0.01450), reflecting that other factors such as patient characteristics may be more important in determining the rate than hospital characteristics. Further testing also showed a high detected bias for the effect of age, gender, DRG and comorbidity risk adjustment on failure to rescue rates. This finding makes risk adjustment important when measuring this indicator.

The failure to rescue measure for this study used the NQF (2004) definition of death among surgical inpatients with treatable serious complications. The numerator

consisted of surgical inpatients (with their primary procedure within 2 days of admission) with complication of care whose discharge status was death (Neonates and newborns excluded). Complications included were sepsis, pneumonia, GI bleeding, shock/cardiac arrest, and DVT/PE.

Hospital Acquired Pressure Ulcer Measure is reported as the result of a monthly prevalence study, conducted on the same day of the month. The measure as defined by the NQF (2004) used the CalNOC definition. The numerator was determined by the number of inpatients with National Pressure Ulcer Advisory Panel (NPUAP) Stage II or greater hospital acquired pressure ulcers. Pressure ulcers were defined as any lesion caused by unrelieved pressure resulting in the damage of underlying tissue. The denominator consisted of all inpatients in the prevalence study, which consisted of all inpatients in each unit on the day the study occurred. Exclusions were patients <16 years of age and skin breakdown due to other causes such as arterial occlusion, venous insufficiency, diabetes neuropathy, or incontinence dermatitis. Also excluded were pressure ulcers present on admission (termed community acquired) as defined by having been documented on the first day of hospitalization or if the prevalence study was done on the second day of hospitalization and the patient's stage II or greater ulcer was already present.

Data Analysis

Secondary data analysis was used for this study, on outcome measures regularly collected by the hospital. The data source for the failure to rescue measure was obtained through the proprietary outcomes data system, Care Sciences, which used the codes of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD -

9 - CM). The data source for the hospital acquired pressure ulcer rate was obtained by the monthly prevalence studies held on the same day of the month, assessing all inpatients in the hospital that day. The disadvantage of this type of data analysis is that the data were not collected specifically for this study and may have contained missing data points or lacked specific factors that would have been desirable to include. In addition, hospital wide and group outcome measures were used as opposed to unit specific, since the volume of failure to rescue and hospital acquired pressure ulcer episodes was too small for unit level measurement. The independent variable was the exposure to the clinical mentor program. Systat 12, StatXact 5 and Statistix 8 software packages were used for data analysis.

Participant Characteristics

Descriptive statistics, incorporating frequencies, percentages, means and medians compared, annually, the groups of RN staff and mentor staff, on age, experience (years in practice), educational level and percent with specialty certification, and the groups of patients on age, gender (% female), and admission source (% ED admissions).

Comparisons between RN staff and mentor demographics were computed using ANOVA procedure for means, Mann-Whitney procedure for ordinal data and Chi Squares for 2 x 2 tables.

Failure to rescue and Hospital Acquired Pressure Ulcer rates

Aim #1: To examine the effect of a clinical mentor program care model on patient outcomes, specifically the hospital wide failure to rescue rate and hospital acquired pressure ulcer rates, longitudinally over a 3 year period.

Poisson regression was used to test for changes in failure to rescue rates and hospital acquired pressure ulcer rates at the multiple time periods pre and post intervention. The Poisson regression is useful in analyzing outcome variables which are numeric, but in the form of counts or rates, and are often measures of rare events, such as the patient outcome rates of interest to this study. In this case the data do not follow the normal distribution or constant variance assumptions required for multiple linear regression. Rather, the variables follow a Poisson distribution which is skewed and non-negative. In addition, the variance increases as the mean increases. The Poisson regression uses a log transformation which adjusts for these characteristics and models the variance as a function of the mean (Simon, 1991). This regression is a specialized case of the Generalized Linear Model, which also includes both traditional regression and logistic regression.

To fit a model using rates, the original count (numerator) and the measure of time/area (denominator) are used. The number of failure to rescue or hospital acquired pressure ulcer events (numerator) were the outcome variables with the log of the denominator in the rate as the offset variable. In general, a greater number of patients at risk will likely result in more occurrences of the outcome measure and the use of the Poisson regression model serves to adjust for the number of patients at risk (Center for Statistical Computing Support, 2008). The independent variable was time, defined at points both pre and post exposure to the clinical mentor program. The model showed if the rate varied over the time periods measured.

Grouped data, such as the failure to rescue rate, made linear regression impossible. Linear regression quantifies the outcome difference between variables, while

Poisson regression would provide the relative risk (RR) on having a failure to rescue event between pre and post exposure to the mentor program. This statistic can be done simplistically with SPSS (using GENLOG procedure), but SAS and STRATA (using GENMOD procedure) would be preferred. SPSS does not allow the investigator to check for the assumptions of over/under dispersion of the model, which is a crucial assumption for a Poisson regression model, and does not have the capability to rectify when the assumptions are not satisfied (Simon, 1991). In the Poisson distribution, the mean is equal to the variance. An over dispersion occurs when the variance is much greater than the mean (the reverse for under dispersion) and will produce severe underestimates of the standard errors, resulting in overestimates of the p -values (more likely to be significant at <0.05). Should this occur, the problem can be rectified by using a negative binomial regression also available in SAS/STRATA (Chan, 2005).

Qualitative Phase

The qualitative portion of the study examined unstructured, interactive interview data from clinical mentors describing their interventions to affect patient outcomes, using the method of situational analysis. Emphasis was given to describing the cues and actions involved in their oversight of patient care. Situational analysis offered the ability to deeply contextualize and situate personal narratives, explaining analytically who and what are in the situation, who and what matters in the situation, and identifying the elements which make a difference in the situation (Clarke, 2005). The analysis was undertaken from the vantage point of those within the situation as well as the investigator. This was a grounded theory method based in symbolic interactionism, in this case examining the context of the improved patient outcome as a function of the

interjection of the clinical mentor into the situation. Situational analysis is based on Strauss's situation-centered social worlds/arenas/negotiations framework (Clarke, 2005). It also takes into account the postmodern shift of thinking from the universal and simplified generalizations, such as those found in the nurse sensitive quantitative measures, to the complexities of constantly fluxuating knowledge and activities situated in a given context, such as that described qualitatively by the clinical mentors. The postmodern influence allows for the emergence of voices not normally heard and it is hoped that this approach will bring to the surface the direct affect of nursing structure on patient outcomes, not captured in quantitative measures.

Qualitative situational data was collected from mentor interviews covering all units involved in the study. Clinical mentors were invited to participate at one of their monthly meetings and by individual letter, explaining the purpose of the research and describing the study requirements. Participants were asked to identify and describe incidents where their intervention kept a patient safe that otherwise may not have been. Their actions included proactive or intervening involvement. The mentors were asked to describe the incident, how the issue came to be identified or brought to their attention, what action was taken and what the outcome affected was, whether a visible outcome or potential harm avoided. Mentors were provided informed consent and apprised that they could withdraw at any time without penalty. The sample size of participants was determined based on the ability of the participants to reflect on and describe their experiences, as well as the quality of the experiences reported. The end point was determined when saturation of the data was reached. (Richards & Morse, 2007)

The disadvantage of the design of this project was the inability to generalize the findings beyond this hospital or to compare the presence of this particular design of an expert on the unit to other models which may have used different expert designs, nurses in a "resource" role, or no clinical expert. While the sample could not be randomized, the RN staff and mentor staff were compared annually on age, experience, educational level and certification to control for confounding variables threatening internal validity. Additionally, the pre and post patient samples were compared on age, gender, and admission source to control for those factors. Reliability was enhanced by measuring one hospital over time, which allowed for consistency in coding, prevalence studies, and the definition of variables.

Qualitative data analysis

Aim # 2: To explore how the use of experienced nurses in the role of clinical mentor on patient care units serves as a safety net for the oversight of patient care and the improvement of patient outcomes.

Aim # 3: To gain an increased understanding of the processes affecting positive patient care outcomes.

These aims were addressed by asking mentors to describe incidents where their proactive or intervening action affected patient outcomes, whether a visible outcome or a potential harm avoided. Interviews were recorded and conducted in a private setting, with the investigator, research assistant and participant only.

The methods incorporated with situational analysis followed similarly to processes used in grounded theory and other qualitative approaches (Clarke, 2005). Initial coding was done segment by segment, with each data situation coded separately. Then, comparison of codes between and among situations determined which codes appeared elsewhere and helped to further develop the code properties. Codes were combined into categories that defined the different elements present in the situation of the various narratives and helped identify which themes were central and which incidental. Factors addressed included the cues that led to the involvement of the clinical mentor in the situation, actions taken by the mentor to influence the situation and patient outcomes which resulted from those actions, as well as poor outcomes avoided. Memoing was incorporated to capture the investigator's thoughts about the data as analysis progressed. Theoretical sampling was used in the analytic process, as missing data needed for theoretical reasons were pursued by the gathering of more narratives or interviews to provide thicker descriptions and achieve saturation.

Situational analysis is the process whereby the situation itself, broadly conceived, becomes the key unit of analysis (Clarke, 2005). Understanding the elements of the situation and their interrelationships is the primary goal, while additionally considering how contextual elements influence the central action. The context of the situation is analyzed from the perspective of existing within the situation, as an integral part of it, as opposed to simply framing it or contributing to it. The goal is to determine how these conditions are felt as consequential, assuming that everything in the situation both constitutes and affects most everything else in the situation in some way.

The fill analysis is empirically constructed through the making of three kinds of maps, which are analytical exercises, serving as a fresh means of getting into the data (Clarke, 2005). They are designed to help answer questions such as the following. What is going on in this situation; where does this situation occur within the larger world; and what seems present but is unarticulated? Who and what is involved in this situation? Who and what matters in this situation and to whom? What elements make a difference in the situation?

Initially, a situational map would be drawn to represent the key human, nonhuman, symbolic, political and other elements involved in the phenomena of interest, in this case, the mentor process in practice (Clarke, 2005). The map constructs the situation empirically and assists in analysis of the relations among the elements. This mapping serves to identify the implicated actors in the situation (mentors), those acted upon (primary nurses, patients), those who are either absent and/or denied agency in the situation but for whom the action taken will likely be consequential (patients), and other salient implicated actors with sufficient power and resources to act but who remain outside the situation (advanced practice nurse, charge nurse, manager).

The social worlds/arena map would show the place of the mentor program in the broader hospital arena where it is undertaken and within the broader context of the arena of quality. Social arena maps are deeply rooted in symbolic interactionism and serve to reveal certain broader conditions, constraints, opportunities and resources that may otherwise go unnoticed. Third, positional maps lay out the major positions taken and not taken in the data around particular topics of concern, and often controversy, found in the situation of inquiry. In this case possibly nurse autonomy on one axis with the need for

oversight on the other (Clarke, 2005). The various maps are analyzed to the extent that addresses the needs of the project at hand (Clarke, 2005). For the purposes of this study and the smaller qualitative component, the focus was on situational mapping only.

Human Subjects

The study was approved by the hospital and university institutional review board (IRB) committees. There were no specific risks or benefits for the patient participants in the study, as this was a secondary analysis of data. No patients were directly participating and data was de-identified for specific patients in the database. Benefits to future patients would be the identification of a process which results in positive patient outcomes. However, the risk (or benefit) to the mentors and the hospital would be related to the amount (or lack) of support generated by the results for continuing investment in the program.

Mentors participating in the qualitative component of the study would have a limited risk of fatigue due to the interviewing process. Interviews and data obtained will remain confidential and study participants, as well as patients or staff involved in the mentor situational accounts, were de-identified. All data collected will be kept for five years after the study is completed, in a locked, private area accessible only to the primary investigator. The ethical issue that could have arisen would have been if a negative incident was described in the qualitative situational data that is unknown to the hospital or patient. Had this occurred, the nurse would have been encouraged to proceed with the usual hospital occurrence reporting process.

This study assessed the potential of a new care model, utilizing clinical mentors, to improve patient outcomes. The goal was to help identify options for strengthening

nurse work processes to close the nurse expertise/patient need gap found in hospitals today.

CHAPTER 4

Results

The purpose of this program evaluation study was (1) to examine the long-term impact of a new care model, instituting a clinical mentor program, on nurse-sensitive patient outcomes, specifically failure to rescue and hospital acquired pressure ulcers, and (2) to explore the process by which patient outcomes are affected. This chapter presents the study findings. First a descriptive profile of the sample, followed by the results for the quantitative portion, and ending with the qualitative findings.

Overview

Secondary data analysis of patient outcome quantitative data collected from January 2004 through December 2007, both pre and post intervention of a new patient care model, was conducted. Single group interrupted time series longitudinal design was used to look at monthly data from prior to the implementation of the clinical mentor model in November 2004, to three years post implementation, in 2007.

Qualitative data from interviews of clinical mentors in the program was used to validate and expand on the primary quantitative results, as well as to examine the process of the intervention. Qualitative situational analysis was completed on data collected in one on one interviews. Twenty-five clinical mentors answered the final three research questions: What do mentors identify as patient outcomes they affect to ensure patient

safety; what cues call the mentor into action in a given situation; and how do mentors intercede in the situation to improve patient outcomes and patient safety?

Both approaches were conducted concurrently in a single phase, enabling the investigator to frame the patient outcomes measures from two different, but complementary data sources. The data sets were analyzed separately, and then compared and contrasted in the interpretation of results.

Quantitative Results

Participant Characteristics

Staff Nurse and Clinical Mentor Characteristics

Age. Clinical Mentors were expert staff registered nurses (RNs) hired into the specific position of clinical mentor. Each year during the study 40 to 46 RNs held the title Clinical Mentor. The total number of RN bedside staff ranged from 581 to 869. Descriptive statistics were computed to profile the two groups (the mentors and bedside RN staff), annually, for comparison across time, including: age, experience (years in practice), educational level, and percent with specialty certification. Age comparisons are shown in Table 2. Data were obtained as a snapshot on the same date in June each year to account for slightly varying cohort orientation dates for the mentors.

Table 2

Mentor and Bedside RN Age Comparison

Year	2004	2005	2006	2007
Data retrieved on date...	6/12/2005	6/12/2006	6/12/2007	6/12/2008
Total RN Bedside Staff (N)	581	766	869	647
% <30 years old	8.78	15.14	20.37	31.22
% 30-40 years old	34.77	34.86	34.18	29.37
% >40 years old	56.45	50.00	45.45	39.41
Mean (standard deviation)	43.80(10.99)	42.15(11.20)	40.89(11.43)	38.60 (11.63)
Range	25-77	24-77	23-77	22-68
Total Mentor Count (N)	40	45	46	42
% <30 years old	0	2.22	2.17	4.76
% 30-40 years old	25.00	26.67	28.26	19.05
% >40 years old	75.00	71.11	69.57	76.19
Mean (standard deviation)	46.35 (8.55)	45.82 (8.77)	45.65 (8,75)	48.1'l (9.64)
Range	31-65	28-65	28-65	24-66

The number of bedside RN staff was calculated according to the National Database of Nursing Quality Indicators (NDNQI) definition of nurses who spend greater than 50% of their time at the bedside. The number of bedside staff rose steadily from 581 in 2004 to 869 in 2006, with a decrease to 647 in 2007. Bedside RN staff age showed a statistically significant decrease over the 4 years, using one way ANOVA, from a mean age of 43.8 to a mean of 38.6, $F(3, 2859) = 23.4$ ($p < .001$). This was driven by a 16% decrease in the percentage of RNs over 40 years old (from 56.5% in 2004 to 39.4% in 2007) while at the same time experiencing a 22% increase in the percentage of nurses

under the age of 30 (from 8.8% in 2004 to 31.2% in 2007) (See Figure 3). All pairwise comparisons were highly significant except for the one from 2005 to 2006 using Tukey HSD post-hoc method (See Table 3). The standard deviation increased from 10.99 to 11.63 over the same period. Both the minimum and maximum ages dropped with the minimum decreasing from 25 to 22 and the maximum dropping from 77 to 68 (see Table 2).

Figure 3. RN Bedside Staff Age by Group Percentages

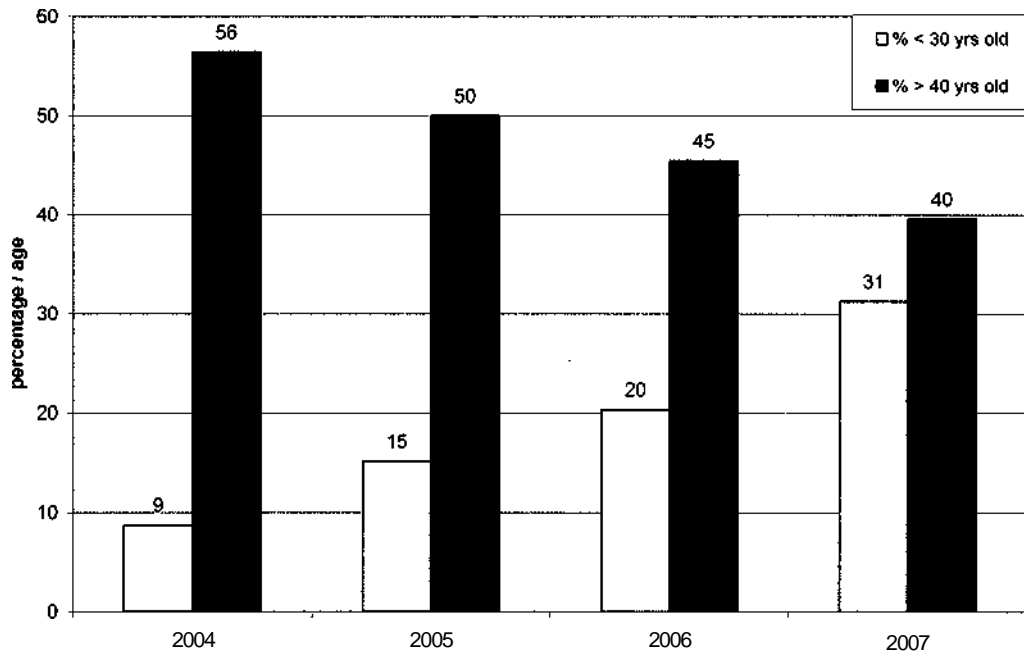


Table 3

Bedside RN Ages over 4 years

Statistix 8.0

One-Way AOV for: A B C D (2004, 2005, 2006, 2007 Bedside RN ages)

Source	DF	SS	MS	F	P
Between	3	9027	3009.13	23.4	0.0000
Within	2859	367308	128.47		
Total	2862	376336			

Tukey HSD All-Pairwise Comparisons Test

Variable	Mean	Homogeneous Groups
2004	43.800	A
2005	42.147	B
2006	40.892	B
2007	38.604	C

Alpha 0.05

Critical Q Value 3.632

There are 3 groups (A, B, etc.) in which the means are not significantly different from one another.

The number of mentors increased from 40 to 46 between 2004 and 2006, followed by a decrease in 2007 to 42. The mean age of the mentors decreased slightly from 46.35 in 2004 to 45.65 in 2006 and then rose to 48.11 in 2007. This was driven by a 5.5% percent drop in the percentage of mentors over the age of 40 (from 75% to 69.57%) from 2004 to 2006, followed by an increase of 6.5% in the year 2007 (to 76.19%). The change in mean ages was not statistically significant over the 4 years via ANOVA, $F(6,159) = .67, p = .57$. During these years, the percentage of mentors under the age of 30 increased from zero to 5%. The standard deviation increased from 8.55 to 9.64. The minimum mentor age decreased from 31 in the first cohort of 2004 to 24 by 2007. The maximum age rose only slightly during this period from 65 to 66.

As expected, the mean ages of the RN mentors were higher in each time period than that of the bedside staff RNs, but of note is that the difference between the two means increased at a more statistically significant rate each year from 2.55 years in the first cohort to 9.51 years by 2007, as the RN staff got younger (see Table 4).

Table 4

Age Difference Between RN Bedside Staff and Clinical Mentors

Mean Age In Years	Year	2004	2005	2006	2007
	Mentor	46.35	45.82	45.65	48.11
	Bedside RN	43.80	42.15	40.89	38.60
	Difference Between Groups	2.55	3.67*	4.76**	9.51***
	(ANOVA) <i>F</i>				
		2.07	4.66	7.70	26.8
	(Pooled Estimate of) Standard Deviation	10.86	11.09	11.32	11.54
	<i>df</i>	(1,619)	(1,809)	(1,913)	(1,687)
	<i>p</i> value	<i>ns</i> , ($p=0.15$)	(* $p<.05$)	(** $p<.01$)	(*** $p<.001$)

Experience. There was no statistically significant difference between the experience level of the clinical mentors and that of the bedside RNs, using Mann-Whitney procedure (see Table 5). The percentage of bedside RNs with less than or equal to 1 year in practice averaged 9% over the study period, while there were no mentors with less than or equal to 1 year in practice.

Table 5

Experience (Years in Practice) for RN Bedside Staff and Clinical Mentors

<u>RN Bedside Staff</u>	2004	2005	2006	2007
% < or Equal to 1 Yr in Practice	9	9	7	11
% 2-10 years	28	31	34	33
% >10 years	63	60	59	56
<u>Mentors</u>				
% < or Equal to 1 Yr in Practice	0	0	0	0
% 2-10 years	34.2	37.7	47.3	40.7
% >10 years	65.8	62.3	52.7	59.3
Difference in Years in Practice, Mentors to Bedside RNs Mann-Whitney Z	Z = -0.70	Z = -0.79	Z = 0.42	Z = -1.07
p value	ns (p=482)	ns (p=.430)	ns (p=674)	ns (p=.289)

Certification. The educational and certification status of the two groups showed the greatest variance. Chi squares were computed to compare both groups each year. The percentage of mentors certified was significantly higher than the percentage of RN bedside staff certified, with an increasingly significant difference each year (See Table 6). Using Mann-Whitney procedure to test for trends, there was a statistically significant negative trend in certification status for the bedside RN group ($p < .01$), and a statistically significant positive trend in certification status for the mentor group ($p < .05$).

Table 6

<i>Certification for RN Bedside Staff and Clinical Mentors</i>					
Specialty Certification	year	2004	2005	2006	2007
% Certified Bedside RNs		39	41	38	32
% Certified Mentors		63	66	76	80
Chi square (1 df)		8.48**	12.24***	30.12***	48.67***
p value		(**p<.01)	(***p<.001)	(***p<.001)	(***p<.001)
Mann-Whitney trend statistic		certification			
Bedside RN		Z = -2.746** (p<.01)			
Mentor		Z = 2.054# (p<.05)			

Education. Interestingly, the bedside RNs had significantly higher educational levels in 2004, with 62% holding a bachelor of science in nursing (BSN) or higher nursing degree while only 37% of mentors held BSN or higher nursing degrees (see Table 7). The nursing leadership had made a decision to preferentially hire BSN prepared nurses. Over the next three years, there was no significant difference in the two groups on educational levels. Neither group had a statistically significant change over time.

Table 7

Education (% BSN or Higher Nursing Degree) for RN Bedside Staff and Clinical Mentors

Education	year	2004	2005	2006	2007
% BSN or Higher Nursing Degree Bedside RNs		62	58	59	57
% BSN or Higher Nursing Degree Mentors		37	47	47	46
Chi square (1 df)		9.32**	2.3	2.83	2.27
p value		(**p<.01)	ns(p =.129)	ns (p =.093)	ns(p =.132)
Mann-Whitney trend statistic for education					
Bedside RN		Z = -1.46 ns (p = .144)			
Mentor		Z = .723 ns (p =.47)			

Patient Characteristics

Patient characteristics were profiled annually over the study period to compare the year to year statistical stability of the study population (see Table 8). The age of patients and the percent of admissions coming from the emergency department were used as markers for the acuity of the patient population. Gender was also identified.

Table 8

Patient Characteristics

year	2004	2005	2006	2007
<u>age</u>				
total # inpatients (excluding neonates)	18548	18911	18176	17787
# inpatients 20-64 years of age	11819	11725	11688	11744
# inpatients >64 years of age	6383	6863	6160	5737
% of inpatients 20-64 years of age	63.72	62.00	64.30	66.03
% of inpatients >64 years of age	34.41	36.29	33.89	32.25
Mean Age (standard deviation)	53.3 (20.8)	54.1 (20.9)	53.5 (20.7)	52.9 (20.8)
Range	11-105	4-110	9-106	10-110
One-way ANOVA for patient age trend over time - ns	$F(3, 73442) = .28, (p = .84)$			
<u>% ED Admissions</u>				
# total admissions	23195	23467	22912	22467
# ED admissions	4562	5192	6952	7384
% ED admissions	19.7%	22.1%	30.3%	32.9%
Mann-Whitney Statistic for % ED admissions trend over time	$Z = 36.83^{**}, (p < .01)$			
<u>Gender (% Women)</u>				
# women	13380	13432	13385	13329
% women	57.7%	57.2%	58.4%	59.3%
Mann-Whitney Statistic for % female admissions trend over time	$Z = 3.15^{**}, (p < .01)$			

Patient ages showed no statistically significant difference over time, using one-way ANOVA. $F(3, 73442) = .28, (p = .84)$. Percent female increased significantly over the four years from 57.7% in 2004 to 59.3% in 2007, using Mann-Whitney procedure ($p <$

.01). Data on the average number of co-morbidities was unavailable, but the percent of emergency department admissions as a proxy for the acuity of the patient population, increased steadily over the 4 years from 19.7% in 2004 to 32.9% in 2007. This trend was statistically significant using Mann-Whitney statistic, $Z = 36.83$, ($p < .001$). Patients were more acutely ill as the study period progressed.

Quantitative Results of Patient Outcomes

Aim 1. Examine the effect of clinical mentors program care model on patient outcomes, specifically the hospital wide failure to rescue rate and hospital acquired pressure ulcer rates, longitudinally over a 3 year period.

Research Question 1.

Is the use of experienced nurses in the role of clinical mentor on patient care units associated with an improvement in patient outcomes, specifically the hospital-wide failure to rescue rate and hospital acquired pressure ulcer rate, and is it sustained over time?

Failure to Rescue Rate

Patient outcomes were measured monthly from pre-existing data regularly collected to report internally and to outside databases. Failure to rescue data from pre-implementation was no longer available. However, data reported elsewhere, showed a significant decrease from the average rate of the 6 month periods before and after implementation of the mentor program, $p = .046$, via 2-sample, 2-tailed t-test (Burritt, Wallace, Steckel & Hunter, 2007). Continuing data post implementation, beginning with

month three of the program showed a downward trendline (see Figure 4). This trend was not statistically significant via Poisson regression, consistent with a flat linear line, suggesting the initial change did not continue to decrease, but rather held the initial gain.

Table 9 shows goodness of fit statistics.

Figure 4. Monthly Failure to Rescue Rate 2005 - 2007

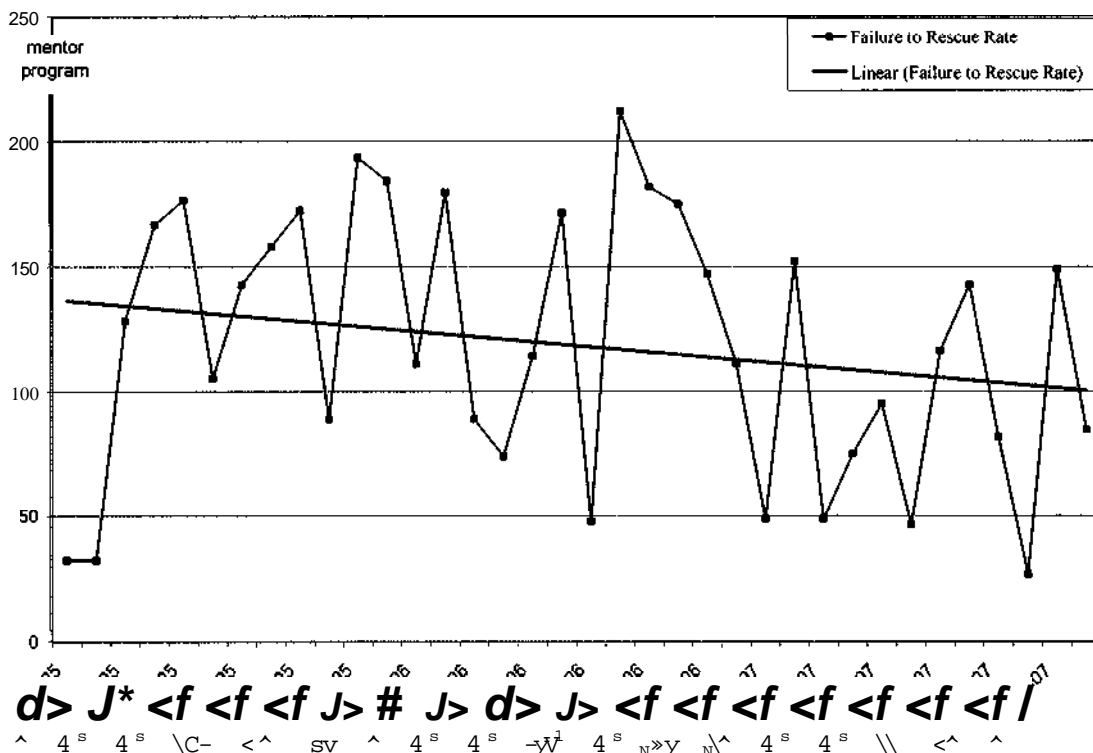


Table 9

Poisson Regression, Goodness of Fit Statistics for change over time post implementation

	<i>Failure to Rescue (1)</i>	<i>Failure to Rescue (2)</i>	<i>Med/Surg HAPU*</i>	<i>ICU HAPU</i>	<i>Falls *</i>
Significance of regression	<i>ns</i> $p = .37$	<i>ns</i> $p = 0.43$	$*p < .05$	<i>ns</i> $p = .57$	$*p < .05$
Goodness of fit					
Deviance	29.19	24.38	39.58	31.82	37.59
<i>df</i>	33	34	34	34	36
<i>p</i> value	0.66	.89	0.23	0.57	0.40

The data regarding failure to rescue came from proprietary software, which was later replaced by a different vendor. When running the post data on the initial software, which was the same software used for the pre/post statistics described as reported elsewhere and here titled Failure to Rescue (1), October 2007 was a clear outlier for denominator cases, reporting 336, when all other months in the database ranged from 27 to 59. This caused the first regression to appear significant. When the outlier month was removed, the regression was not significant. To validate the lack of significance with the one month removed, Poisson regression was run on data obtained from the second proprietary software titled Failure to Rescue (2), which had no outliers and found similar non-significant results. Interestingly, both companies reported using the AHRQ definition of failure to rescue, yet each had different numerators and denominators using the same coded data.

Hospital Acquired Pressure Ulcer Rate (HAPU)

Hospital Acquired Pressure Ulcer (HAPU) Rates were obtained from prevalence studies completed once a month as defined by the National Quality Forum (NQF) in 2004; the number of patients with stage II or greater hospital acquired pressure ulcers over the number of inpatients assessed on one day each month. These rates were reported by the hospital for hospital-wide, medical/surgical acute and intensive care unit groupings. Comparisons from pre to post implementation of the mentor program were computed using 2 x 2 tables and reported in odds ratio. Change over time post implementation was evaluated by Poisson regression.

Hospital-wide HAPU rates showed statistically significant improvement from pre to post-implementation, Odds Ratio = 1.57, CI95 = (1.26, 1.97), with a drop immediately post-implementation, a rise in year two, followed by another drop in year three of the study period (See Figure 5). ICU rates drove the hospital-wide increase in year two post implementation, and showed no statistically significant difference from pre to post-implementation, Odds Ratio = .97, CI95 = (0.68, 1.39), or change over time via Poisson regression ($p = .57$) (see Figure 5). Medical/surgical HAPU rates drove the hospital-wide changes, and showed a large statistically significant decrease between pre and post-implementation, Odds Ratio = 2.35, CI95 = (1.75, 3.16) and a sustained significant negative slope over the study period, $p < .05$ (see Figure 6). Thus, a patient had 2.35 times greater odds of NOT acquiring a HAPU after the implementation of the mentor program than before. Figure 7 shows the relevant comparison between observed med/surg HAPU rates versus expected (the fitted values from the Poisson regression). There appeared one clear outlier month in August of 2006 (within data point Quarter 8 on figure 7) with 7

HAPU events, when 2.7 were expected in the Poisson regression. Statistics for goodness of fit to Poisson regression lines are reported in Table 9 from all patient outcomes measured.

Figure 5. Hospital Wide (HW) and ICU HAPU Rates Monthly 2004-2007

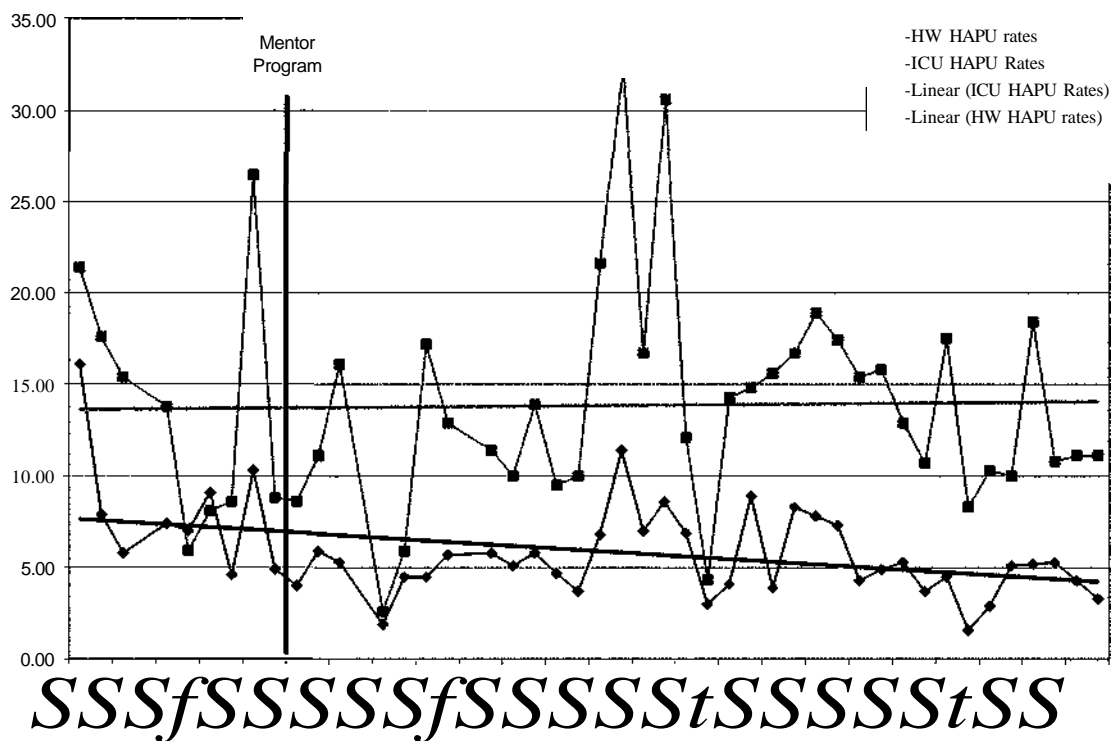
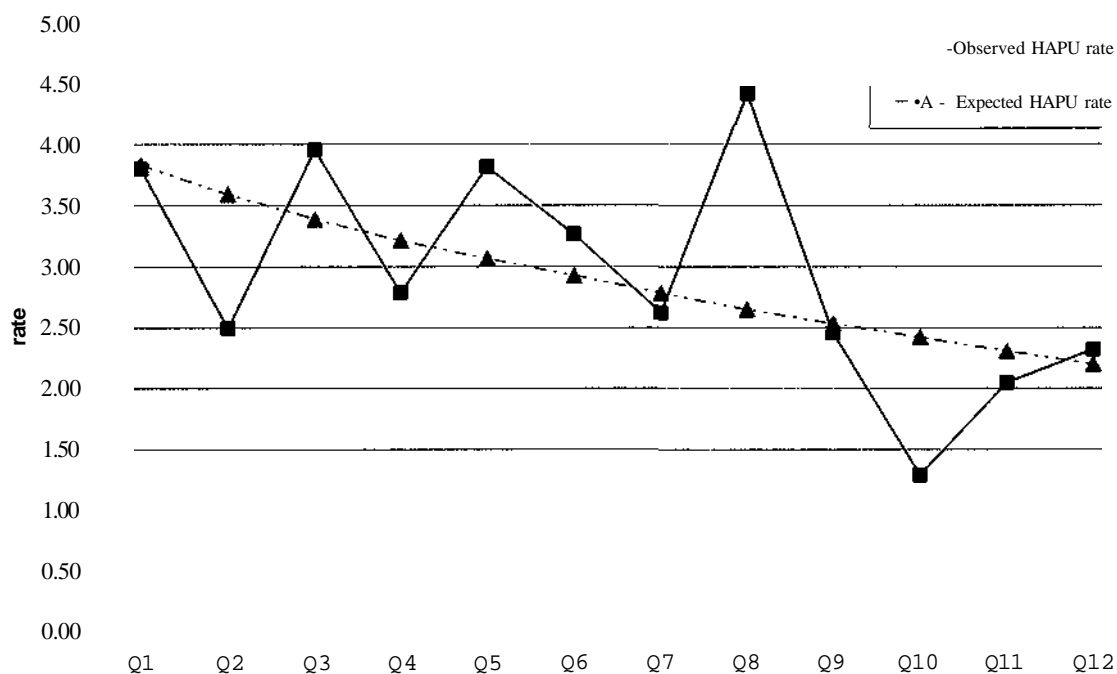


Figure 6. Medical Surgical Monthly HAPU Rate 2004-2007

• 1	mentor program	-•- Med Surg HAPU rate
		— Linear (Med Surg HAPU rate)

#VV A*VVVV A*V% ^V ^V%A*V ^VV

Figure 7. Observed vs Expected Med/Surg HAPU Rates
Quarterly Post Implementation, November 2004 through December 2007



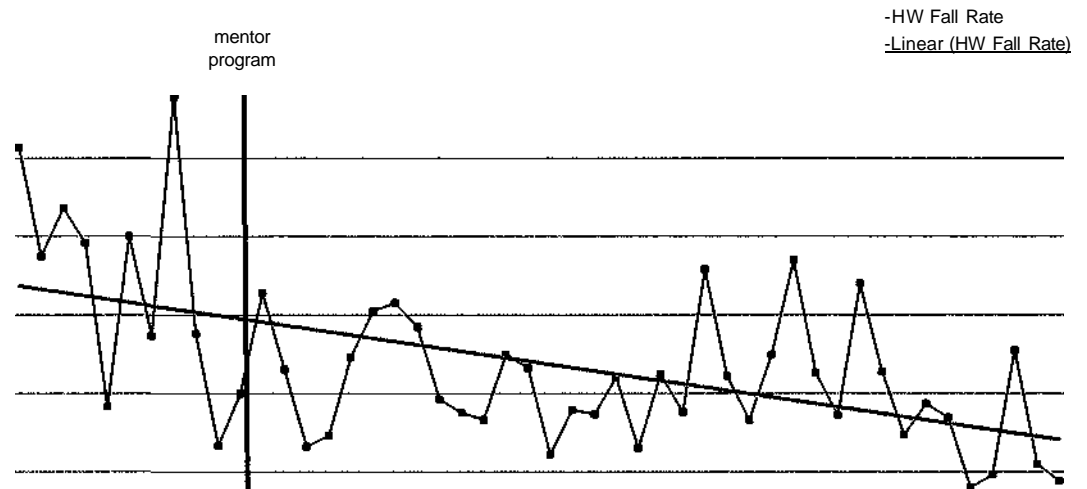
Additional Findings

Hospital-wide Fall Rate

The Hospital-wide falls rate also showed a steady negative linear trendline from pre-implementation to post-implementation over a three year period (see Figure 8). In the data reported elsewhere, the 6 month average fall rates from before and after the implementation of the mentor program were not statistically significant ($p = .06$) using 2-sample, 2-tailed t-test. (Burritt, Wallace, Steckel & Hunter, 2007). However, when compared over the full length of this study period, there was a significant improvement, Odds Ratio 1.48, $CI_{95} = (1.29, 1.70)$. Thus, patients were 1.48 times more likely NOT to fall after implementation than before. Additionally, the post implementation continuing downward trend is statistically significant ($p < .05$) using Poisson regression. Observed

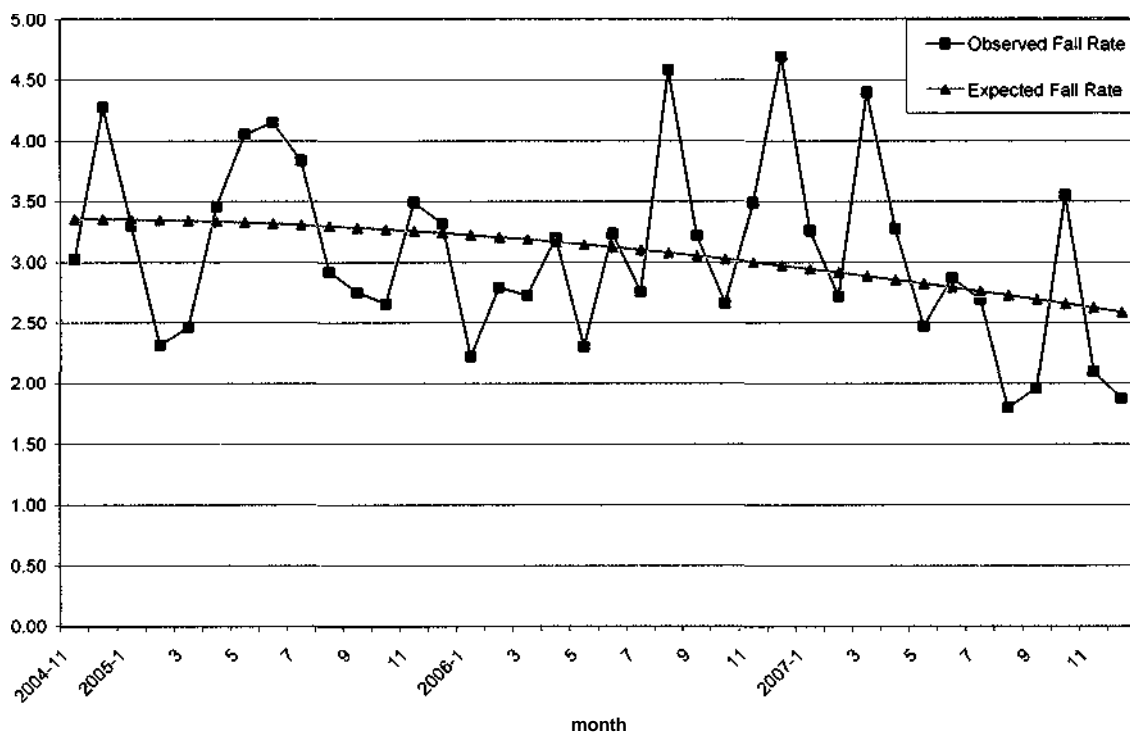
versus expected rates are shown in figure 9. Three outlier months were noted, August and December of 2006 and March of 2007.

Figure 8. Hospital Wide (HW) Monthly Fall Rates 2004 - 2007



$X^{\wedge}VV^{\wedge}$

Figure 9.
Observed versus Expected Fall Rates, Monthly Post Implementation Nov 2004 to Dec 2007



Qualitative Results

Aim 2. Explore how the use of experienced nurses in the role of clinical mentor on patient care units serves as a safety net for the oversight of patient care and the improvement of patient outcomes; and

Aim 3. Gain an increased understanding of the processes affecting positive patient care outcomes.

Situational Analysis was used to interpret qualitative data from one-on-one interviews with the clinical mentors to answer the following research questions:

RQ2: What do the mentors identify as the patient outcomes the clinical mentor affects to ensure patient safety?

RQ3: What cues call the mentor into action in a given situation?

RQ4: How do mentors intercede in the situation to improve patient outcomes and patient safety?

Twenty-five mentors, constituting 29% of the 86 different mentors in the role over the four year period, participated in one on one, unstructured, interactive interviews with the researcher and a trained research assistant. A research guide (appendix A) was used to help focus the interview as needed. The researcher asked the participants to describe situations where the mentor affected patient outcomes, including: the cues that brought them to the situation, their actions taken, and the resulting changes in patient outcomes. Clinical mentors were invited to participate by email and in person during their monthly meetings. Each interview was held in the researcher's private office and lasted approximately one hour. Interviews were audio taped and transcribed by the trained research assistant present at the interviews. Transcripts were reviewed for accuracy by the researcher. Field notes were also taken. Data was coded and situational analysis was applied to identify the elements that made a difference in a given situation (Clarke, 2005). Themes were reviewed by a second reviewer, and validated with 5 of the participants. Results are presented specific to each research question.

The situational analysis process began by identifying who and what were involved in the situation. A mentor connected with all players in the hospital arena throughout their work day: staff nurse, charge nurse, manager, educator and advanced

practice nurse (APN) as well as patient, family, physician, ancillary, and assistive personnel. Mentors identified themselves and described their role in similar ways. When introducing themselves to the patient, most described in some version, "I work with the nurses to take care of you, an extra set of eyes, ears, hands..." and many added "...to ensure you are safe and everything is going well." When introducing their role to staff nurses, they most often explained "I'm here to guide, coach, advise and teach." One said that she was like a "lifeguard guarding the water" and another described her role as a cross between a nurse practitioner (NP) and an educator, "I round on patients and bring it all together, bringing practice along, and adding another level of safety." A third explained, "The charge nurse manages operations; I manage the floor clinically." Success in the role was described by mentors as when staff remark, "When the mentor is here, it's going to be a good day," or "Staff feel supported, and feel that if something happens they cannot handle, they will have help and will learn something." Another mentor stated, "Half my job is quality assurance, to make sure the patient is getting what they are supposed to, the other half is quality improvement, to make sure what they are supposed to get is the right thing." The overall theme was clear that the mentors took pride in their work and in making a difference for each nurse and each patient.

Research Question 2 (RQ2): Patient Outcomes Affected by the Clinical Mentor

RQ2: What do the mentors identify as the patient outcomes the clinical mentor affects to ensure patient safety?

Indirect Patient Outcomes

Theme I: Real-time Staff Nurse Growth and Development

Mentors were confident in their discussions that they positively affected patient outcomes and had many anecdotal examples within their stories. But, as one noted, "our effect is not always real measurable or real immediate." The most universal means to ultimately affect patient outcomes was indirectly, through stimulating real-time staff nurse growth and development. One mentor described their effect over time as, "Nurses have really grown, their thinking is getting a lot clearer." Another said, "Mentors push the nurses to be their best and really develop." An ICU mentor felt that new nurses advanced faster with a mentor guiding them because they helped answer their questions and gave them opportunities to learn with more acutely ill patients. A general theme was that of providing a safety net for nurses so that they were comfortable asking questions and giving care even when doing something new. Mentors had received feedback from staff nurses on what mentoring had meant to them. For some, they were empowered to transfer from the medical-surgical floor to the emergency department (ED) or intensive care unit (ICU) because mentoring helped them take that move. For others it was growth within their own unit, "I realized I affected practice when I see a new nurse suddenly in charge or on the radio and practicing like I would!" The difference without mentoring was described by a nurse who went traveling as "feeling stranded". Such comments caused most mentors to feel they improved the retention of nurses. They stated that the nurses appreciated the help on the floor and mentors made it easier to do the right thing for the patient: by having help to get patients mobile, obtaining information on the disease process or helping to prepare for the physician rounds so they could communicate

well and get what they needed for the patient. As one mentor remarked, "There's a gap between the novice nurses and my skill set. I fill the gap so we are all on the same page, doing the same thing at the same time. The gap could be knowledge, skill set or experience, they are book smart, but don't have the practical know how." Another mentor commented, "The outcome I notice regularly is when I see the nurses carrying forward knowledge that I have been teaching them or I hear them owning the ideal of things we have been espousing," such as nurses being "all over why the patient still needs their foley." A third mentor noted, "Before the mentor role, new graduate nurses would not bother the charge nurses, thinking they were busy and instead, asked another novice nurse [when they had a question], at times ending up with a situation that could have been prevented."

Theme II: Practice Improvement

Another indirect effect on patient outcomes occurs when mentors got involved in practice changes. Mentors followed up on the suggestions from staff nurses for improving care. They had the time and knowledge about how to work through the system and various committees to bring an idea to fruition. Often, this involved creating new physician order sets or policies. One mentor commented that this helped the staff satisfaction, knowing that they could bring forward a care issue and get it addressed for positive change. Other times, the mentor would help an RN resolve an identified problem themselves, such as when one RN noticed two medications, which looked the same, placed side by side in the medication delivery system drawer. The mentor walked the nurse through who to contact and enabled her to successfully enact the appropriate change. Mentors also drove practice changes directly. One mentor noted that the physical

layout of patient rooms, where the sink was placed inside an inner bathroom, made handwashing difficult when caring for isolated patients with certain highly contagious organisms. She worked with the infection control and engineering departments to set a new standard for when to deploy a portable sink outside the room, greatly reducing the infection risk.

Direct Patient Outcomes

Theme III: Patient Satisfaction

Mentor stories reflected the impact of the mentor program as the patients themselves described it, increasing their satisfaction from feeling the added level of safety net and teamwork. One family member noted, "I am happy to see that you are on, rounding and helping." The mentor was able to put another family at ease in a long, complicated patient situation with the patient not progressing well. The family was afraid and found comfort from seeing the same faces of the mentors, knowing an extra set of eyes and ears were involved in the situation who knew the patient's history. One mentor noted that patients commented on the teamwork between the mentors and primary nurses. They were in a vulnerable situation and appreciated having a team looking out for them. One such example happened in the ICU when a patient was admitted from the ED, and required multiple room changes and interventions early on, while at the same time his nurse was also busy with her other assigned patient. The mentor later went into the room to help turn the patient and identified compartment syndrome, which is a medical emergency, and required immediate intervention. She stated, "It helps to have another pair of eyes, looking at the whole picture without the tunnel vision that can come from the pressure of hanging meds or changing lines." Another mentor noted that physicians

also felt more comfortable knowing there was an expert on the unit, watching over patients. Satisfaction was felt by the mentors as well, "[the program] is rewarding for me, the nurses are happy and the patients in the end are getting better care."

Theme IV: Real-time Intervention to Prevent Error and Avoid Harm

More direct patient outcome effects could be categorized into two themes brought out in the interviews. The first was real-time intervention to prevent an error or further deterioration of a patient situation. Examples included "catching a stroke in progress" and "catching a patient going downhill". One mentioned there were "less codes on my shift and increased Rapid Response Team calls due to noticing problems earlier." Sometimes it is the "little things" like questioning why the foley catheter is still there (to avoid infection), doing tough intravenous (IV) line starts to prevent the patient receiving multiple sticks (to increase patient satisfaction and quality care) or increasing the awareness of fall risk and rounding, "which has helped decrease the fall rate on my unit". Every mentor had their focus. One mentor was the first to discover a wound infected with Vancomycin Resistant Enterococci (VRE) that was not being treated. The bedside RN noticed the white blood count was up, but didn't know why. Upon taking the time to investigate, the mentor found the culture result was unreported due to a change in the electronic medical record making it unviewable. The report showed the surveillance culture only, not the wound culture. The physician was called and the appropriate treatment started immediately. "There is definitely more impact on patient care and teaching than would happen without the mentor; when a patient is crashing, I can help and then teach about it later on." One mentor reported, "I know I've made an impact on sepsis in the emergency department, by explaining the pathophysiology and the new

equipment we use (Vigileo) to monitor." Another prevented unnecessary blood transfusions by intervening to ensure a Constavac (equipment to reinfuse a patient's own blood postoperatively) was started in time to be effective.

Medication interventions were identified, often related to chronic home medications not continued during the hospitalization. "When a hip replacement patient went into atrial fibrillation, or another patient had an increasing heart rate, the mentors found the patients had not been placed on their home cardiac meds." The mentor's involvement in medication related issues avoided multiple medication errors. One mentor stopped an RN from pushing an IV syringe with fluid that had "clouded up," another stopped a nurse from hooking up normal saline to an epidural line when the medication bag ran out. There were reports of detecting medications given that should have been held, or "sloppiness" in medication administration, such as an IV bag not fully labeled or medication "pushed too fast IV." One mentor interrupted a medication pass when there was an error on the medication administration record (MAR) for a protocol which had changed over time. The bedside nurse didn't know that it was wrong, but a separate set of eyes with greater knowledge caught the problem. Mentors also had stopped RNs and physicians from using shortcuts when moving quickly, which bypass safeguards. This included helping physicians write orders properly in the ED. "It used to be understood what was meant when a physician wrote GI cocktail with proportions in numbers following, but it now needs to be written out." While all mentors were able to provide specific situational accounts, the general statement which captured the theme was, "Just catching stuff, lots of clinical stuff everyday."

Theme V: Proactive Intervention to Improve Nurse Sensitive Indicators

Preventative Care. The second theme identified under the mentors' direct effects was their proactive interventions to prevent negative patient outcomes. Mentors felt their outcomes were often geared toward prevention because they were looking at the whole picture of the patient stay. "I help increase mobility by pushing the nurse to get the patient out of bed when it is easier to let them rest. This can lead to decreased pneumonias, better functioning when the patient leaves the ICU, less delirium and better skin. We help bring the patient up to their fullest potential before leaving the intensive care unit (ICU) so they are not just waiting in bed to get to the medical-surgical floor." One mentor stated, "I do a lot of congestive heart failure (CHF) teaching on my rounds", which has been found to decrease readmission rates. Other examples included a post-op patient not drinking much who was kept on IV fluids through the day to prevent dehydration. For patients with a high fall risk, mentors expedited addressing safety issues in the care plan by changing the patient's room closer to the nursing station or arranging transfer to a higher level of care, such as a stepdown unit for increased observation. Mentors helped prevent urinary tract infections (UTIs) by monitoring foley care: foley bag positioned for free flow, hydration, foley removal when not needed. Later cohorts of mentors helped nurses follow up on core measure and Institute for Healthcare Improvement (IHI) bundle checklists to ensure everything the patient should be getting was covered to prevent complications or negative outcomes. "We look for the head of the bed up, deep vein thrombosis (DVT) and gastrointestinal (GI) prophylaxis." Mentors universally agreed that they upheld the standards of care on their units. When teaching nurses, they would walk them through the actual policy and procedure "closing the gap

between policy and practice." This kept the focus on providing standardized, evidence-based care, which would produce positive outcomes. Such an achievement was evident through one mentor's story which highlighted two patients on her unit greater than 100 days with perfect skin. "We make a big difference in HAPUs because we are very focused on it." Mentors reported acting as a resource for staging ulcers and consulting on care for RNs uncomfortable with the process.

Theme VI: Proactive Intervention to Establish Effective Communication.

Most mentors believed their contribution to effective communication was pivotal, especially between RNs and physicians. The Joint Commission has stated that the number one root cause of sentinel events is poor communication (citation). Mentors helped prevent such events by: preparing nurses to give report to physicians, role playing effective communication prior to calls, and counseling them on when to call. Mentors often described teaching or walking nurses through the SBAR communication model, which outlines a standard, effective format for presenting information by describing the Situation-Background-Assessment-and Recommendation in a given situation. Mentors also reported that they interpreted or assisted with communications between physicians and nurses, and helped encourage relationship building between those of different disciplines, by making introductions. Mentors used the relationships and rapport they had built with physicians over time to improve communication. As one mentor noted, "We may get a quicker response to our call. The physician knows me more than the new nurse and I make them get to know each other; make the RN round with the physician and I go in with them." Another described herself as a liaison between RNs and MDs. Mentors discussed with RNs "why an MD ordered certain things" and when MDs had questions or

issues with the care their patient received, they would serve as educator or facilitator to help resolve the problem. Mentors used their expertise to make a difference in the many anecdotal situations they described and they were recognized as experts.

Research Question 3 (RQ3): Cues Calling the Clinical Mentor to a Situation

RQ3: What cues call the mentor into action in a given situation?

The mentors universally described three actions taken early in their shifts; report, patient rounds, and chart review, not necessarily in that order. These three actions developed into the themes around how a mentor becomes aware of a situation needing their involvement, in addition to being directly contacted to intervene in a situation.

Theme I: Report

The first theme was report; mentors received multiple forms of a report. Regularly, there was a shift-to-shift report from mentor to mentor, most often in a written log format, which highlighted which patients needed expert oversight, which nurses may need assistance or have been working on certain skills, and what patients have been seen that shift, versus which still need attention from the oncoming mentor. In addition to this handoff, many mentors reported listening to bedside report or more often, receiving a report from the charge nurse, on the state of the unit and nurses working that day. Occasionally, a mentor was asked by a nurse on the outgoing shift to follow-up with someone on the next shift, "this is a teaching moment, can you guide this nurse." Mentors described actively listening for red flags to follow-up on after these reports. "A lot of things pop into my head that I know nurses forget, such as verifying the resuscitation

status, especially after a transfer from the ICU" or "if in report I hear a patient didn't have a good night, with shortness of breath and chest pain, I am going to check further into it and talk to the patient." One ICU mentor stated, "Weakest nurse, sickest patient; that's my mantra. I would check in on them right away just to make sure." Additionally, when mentors received report to provide break relief, they would take the opportunity to assess the patient, comparing the report obtained to what they saw in person and addressing issues with the nurse.

Theme II: Rounds

The second and strongest theme for how a mentor became aware of a situation was from cues received during rounds. All mentors rounded on patients daily and described various types: safety rounds, environmental scans and patient visits. Most all said they start out by asking the patient how they felt they were doing and what concerns they had. "Talking to the patient is key." One mentor noted that the patient will tell them things they might not tell others: "We take the time to listen to the patient; we create a space where they can come up with stuff and you give them a moment to breathe, give them the feeling that someone is really listening to them. The expert mentor is more present to them; the patient interaction is not rushed with the mentors, where the young nurses, especially, can lack the human connection to the patient." One mentor found out by talking to a patient during rounds, that they had a cervical spine fusion days prior to that current hospitalization for pneumonia, and had been coughing since discharge. The patient hadn't mentioned this to the physician or primary RN. The mentor, pursuing possible aspiration requested a swallow exam order from the physician and was able to confirm that was the underlying problem. The X-rays had not shown a typical aspiration

pneumonia picture and the initial aspiration risk screen had been missed. The mentor's conversation with the patient helped get the patient on the right course of treatment.

The mentor rounding process was described as an activity done from the view of an expert and different than the rounding of the novice nurse. They described situations such as "I walked past the room and something didn't sound right; I heard loud snoring (1-4) of a particular sound I only heard once before, when a patient was extending their stroke." Or another, "I look for things that are unusual for our floor, such as chest tubes" and verify that they are applied properly. "I see what the patient looks like, that feel when you've been a nurse awhile, doesn't look good, and I know I need to keep an eye on that one." Another mentor described her rounds. "I scan the environment, looking for clutter, fall risk [prevention], [appropriate] supplies [or the] bed alarm on. Then I interview the patient and ask how the hospitalization has been and if they have concerns or questions. When I enter the room, I have a mindset of what the patient is here for and I look for things that fit, such as an incentive spirometer for a pneumonia patient." Mentors noticed things such as an IV bag hanging at the bedside, that had not been used in a couple days; "you see things." Maternal Child Health mentors focused on how well the babies' feedings were going, citing the highest risk for readmission was jaundice, a result of poor nutrition. Mentors felt like they had more awareness when rounding, because they were purposely looking for problems. One described it as "seeing things differently." While an RN could be task oriented upon entering a patient room, the mentor scanned the environment and looked at the patient. They would notice things like a patient who was supposed to be on oxygen therapy, but the setting wasn't correct on the wall meter, or a chest tube not hooked up to the appropriate suction.

The mentors use triggers to help focus their rounds, such as patients having problems or who are clinically complex, lab results that need follow-up, a novice nurse assignment, or "procedures being done that are new to our floor." Sometimes the trigger is as simple as "the nurse was talking about expecting to have an awful day. After getting her to focus, I found out her patient had a change in status and was now lethargic. We figured out together how to keep the patient safe, so we could investigate why the change in level of consciousness." Increasingly, mentors have made use of rounding checklists. These provide a systematic means of validating that specific care needs have not been forgotten, such as a peptic ulcer prophylactic for core measure standards. Medical-surgical units have high risk IV drip rounds, checking on patients with chemotherapy, heparin, or insulin drips as a routine. Many of the rounding stories illustrated expert pattern recognition where the mentors noticed something out of place, which could have been by sight, conversation, active listening, or smelling, and followed-up, where others might not have noticed.

Theme III: Checking Patient Charts

A third means of identifying cues came from checking the patient charts. The mentor stories revealed that they looked for things which don't make sense. "I find stuff on the orders, like checking blood sugars, but notice they are not on their home diabetic meds. I ensure the patient receives meds and a diabetic educator consult." Another reported, "On our unit, we start the day with the list of blood sugars out of range and investigate why: are they on steroids and not covered, or not on their home meds." A third stated, "I glance at the monitor and see bradycardia, then look at the strips and see first degree block. I look deeper. Have they always been in block? Or if second degree

block, are they on beta blockers?" Mentors looked for congruency with what they expected to see in the patient's chart based on the patient's diagnosis and progress noted in report or on their rounds. "I find a lot of things missing, little things like no sequential compression devices (SCDs) applied or no orders to treat a high glucose." Mentors also coached the primary RNs through the core measure checklists, to help them identify not only if an item was completed, but whether the intervention was working. One theme noted by a mentor was that they have "the time to sit down, look over the patient's results on the chart, the physician progress notes, and follow a patient over time". "Knowing the patient's history and their progress on the unit, such as a patient with repetitive plural effusions, enabled me to focus on the patient as a whole, more than just [focusing on] the daily assignment." Another mentor would review the plan of care with both the nurse and the patient, to ensure all was in order for discharge and validate that the patient understood the plan. This approach mirrors the lateral integration role of the Clinical Nurse Leader, reported in the literature (citation).

Theme IV: Called to the Bedside

A final theme for discovering issues came from being directly asked to intervene in a situation. Mentors were called to the bedside by primary nurses or even called to another floor by a nurse. One typical scenario was when a telemetry certified nurse called the orthopedic mentor regarding questions on activity for an orthopedic patient transferred to their floor for cardiac complications. Sometimes mentors were called to weigh in on a situation by a physician. A physician during rounds asked the mentor about some information that didn't make sense to him and they figured it out together.

A common theme in the mentor stories was being called to the bedside by a nurse who interpreted the patient situation as being in a "gray zone". "Either they were not sure what was going on with a patient, or they had a choice to make, do I do A or B? Should I hold a med, or which med should I give now? Should I call the physician?" As mentor, "I walk them through the patient's trends and answers to a series of questions, such as: what orders did they have; what were they doing or giving that could have caused the problem with the patient and was it actually a problem? Sometimes the RN just wanted to make the patient look perfect, with the perfect blood pressure or heart rate, when it was clear the patient was fine once we identified what was normal for that patient." One mentor explained that, "Decisions for prn medications take experience and knowing all the information, what meds they are on, what's affecting it, anatomy and physiology and how it all works." Most mentors felt direct questions about medication saved potential adverse outcomes. They found when they discussed the patient situation with the RN medications were given that would otherwise have been held, saving a near miss situation. Sometimes this came in a round about way, such as when one physical therapist wanted to know if he should hold therapy because the patient's blood pressure (BP) was low. The mentor asked why the BP was low and walked them through thinking about other parameters such as the heart rate and what medications had been given. Finally, they elected to start with dangling at the side of the bed and see how the patient tolerated it, rather than holding therapy, since the ultimate goal was to get the patient up and home. A common mentor goal expressed was that the staff RNs would make the decisions, not because they were told to, but because they understood and were comfortable with the reasons why. At times, a nurse would "grab me when a learning/teaching moment comes up." For

instance, "Once a nurse called me into the room because the patient had a new test in nuclear med she was unfamiliar with. I talked her through it and helped show her resources on the computer she could use to educate the patient." Other times an RN "will ask a question that does not make sense, such as 'how do I hook up SCV02 to monitor my PICC line?' You know it's an opportunity [to get involved]."

Research Question 4(RQ4): How Mentors Intercede in a Situation

RQ4: How do mentors intercede in the situation to improve patient outcomes and patient safety?

Mentors acted as a guide, bringing the qualities of expert practice to the situation, and engaged RNs in all phases of the nursing process; assessment, planning, intervention and evaluation. They described their role as serving to empower, enhance and elevate nursing practice for improved patient safety and outcomes. One mentor commented that Florence Nightingale stated the goal of nursing was to put the patient in the best situation to heal, and similarly, mentors serve the nursing staff by putting the nurse in the best situation to give care and grow.

Assessment

Theme I: Deeper Assessment

Mentors helped the assessment process by ensuring all the facts were engaged to create a full picture of a patient situation. The strongest theme was that mentors provided a *deeper assessment*, looking beyond the obvious and the numbers. "By obvious numbers (blood pressure, heart rate) the patient was ok, but as a mentor I looked deeper to see

dilated pupils. The RN wasn't grasping that the patient was not normal." In one situation, the "nurse put ice packs on the patient for a high fever, then wanted to call the physician for an increased heart rate, because she was focused on the numbers. As the mentor, I walked her through what could be causing the high heart rate and connected the two, resulting in a call to the physician for a fever, not for the increased heart rate."

Another mentor described this situation, the "patient was confused; the RN thought it was baseline. It was her first day with the patient, but I was here yesterday and knew it wasn't baseline. The RN was not sure of the next step, so I suggest a deeper assessment of neurological and blood sugar checks. On deeper evaluation, we found facial droop and caught a stroke in progress. The nurse didn't piece together what all it could be." In the ICU, one nurse was taking care of a "very complex patient with no time to sift through the chart and find out why the patient was so squirrely." When the mentor looked deeper into the situation, she "found a boatload of meds he was taking at home that we were not giving him." The situation improved when the full picture was assessed and appropriate action taken.

Deeper assessments help bring hidden problems into view. One patient was found on the ground from a fall when trying to use the urinal, after a possible vagal response. The mentor reviewed the medications the patient was taking and noticed digoxin, so he looked at the monitor and saw the patient was in bradycardia, with a heart rate around 40 beats per minute. He was able to call the physician, get a digoxin level ordered and ultimately correct the underlying problem. Another patient who was admitted for a pelvic fracture had been doing well, but started to complain to the nurse about her bladder feeling full, yet the foley catheter seemed to be working appropriately. The mentor first

suggested an ultrasound check to ensure the bladder was emptying and when confirmed, performed a deeper assessment. She noted a slightly distended belly and what looked like a fresh bruise on the patient's hip. The mentor asked the patient if she had been on blood thinners and the patient said yes. The physician was contacted and a deeper workup revealed a bleed into her pelvis. Treatment was immediately altered and the issue addressed before life threatening symptoms occurred. "Sometimes nurses collect data (heart rate is up, blood pressure is down) and feel the need to call the physician to report, without actually making an assessment. The mentor helps get the whole picture and identify what needs to be addressed right away."

Theme II: Evaluating Trends in a Situation to Connect the Dots

Mentors helped connect the given situation to a trend and compared that with their experience, whether assessing a patient or determining which action to take in a "gray zone" of choices; "I get them to look for trends, evaluating how they handled something yesterday and how the intervention worked; they tend to have a 12 hour focus." Mentors used pattern recognition, connecting the dots to the patient's history or what had worked in previous shifts, with a focus on seeing the patient in the situation and getting to know them over time. "We had a chronic dialysis patient they were planning to put on every day dialysis, who started having heavy labored breathing and dropped his oxygen saturation. As the mentor, I knew the plan for this patient and put it together with his history of fluid overload episodes, in and out of ICU. We had an order for respiratory treatments, so, I got the respiratory therapist (RT) there for an emergent treatment, but even the RT pushed back, saying the patient didn't need it, yet he did it to make the mentor comfortable. After reaching the patient's nephrologist, he was placed on a

continuous positive airway pressure (CPAP) machine and transferred to the ICU within 30 minutes. Quick action avoided intubation by being on top of the respiratory problems while calling the physician."

Mentors also brought physician preferences into the picture, "knowing their quirks and what they would want to be called about." They regularly reviewed physician progress notes to see if a physician knew about a problem or what their plan was for the patient. When a patient pulled out his foley catheter on a night shift without a mentor, the staff didn't call the physician, but just replaced the catheter. However, the mentor the next day noted that had they read the physician progress notes, they would have found that the patient was intended to be discharged the next day and would have just left the foley catheter out. The mentor was able to debrief the event with the night RN as a learning experience.

Mentors also reported that they noticed trends of lab results becoming worse over time. They discussed these with bedside nurses who had focused on the current labs only, without putting the trend together. Once they understood, the trend would be addressed. The "goal is to prompt the nurse to understand the whole picture of the patient and then focus on what is needed to get the patient better and ultimately discharged safely, as opposed to just passing meds or doing an assessment early in the morning." Through the process of expert assessment and questioning, mentors helped to identify the real problem in a situation, focus on salient facts and guide the RN to decisions. What drug should I give? Should I call the physician? Mentors helped nurses think through all the data they had to build understanding about why a decision was made to hold physical therapy for a

drop in blood pressure or hold a medication, rather than just following what someone told them.

Previous experience helped the mentor to connect the current assessment with what should be expected. One maternal child health mentor explained, a "new nurse thinks things look good, but they may not be underneath. The patient can look right, but not be right." She described a situation where a breastfeeding baby appeared to have a good latch, but in actuality the mom was not expressing milk and the baby's temperature was rising due to dehydration. In another situation, a baby had two normal blood sugars followed by a third of 42 mg/dL. "I told the RN to check one more time, just before feeding and sure enough it was 28 mg/dL. The baby was transferred to the neonatal intensive care unit (NICU). I could tell the color was not good and how he was laying was just not right. When you see a lot of babies, you just know."

A mentor in the ED was helping to undress a confused, restless patient when she noticed a rash "typical of toxic shock, which I had seen in the past. We were able to get quick action for diagnosis and treatment. I was able to move the situation along quicker than it would have with a newer nurse." Additionally, putting a pattern of symptoms together more quickly ensured appropriate action was taken in a more controlled and organized manner. The less experienced nurse tended to be more reactive and would wait until the numbers reflected a problem, at which time the event would become more rushed and emergent. In a similar manner, a medical-surgical mentor found a patient slumped over, sitting in a chair. The RN thought the patient was just tired, but the mentor helped engage the nurse to determine why they were like that, having considered the

possibility of a stroke. "That's not a normal tired." Again, faster action resulted as the stroke team was quickly called to the bedside.

Planning

Theme III: Involving the Patient

Mentors engaged in the planning process by helping the RN to outline the course of action with the patient and appreciate the patient situation within the full continuum of care. They engaged the patient in the plan of care, and spoke directly to the patient to help identify what was important to them and what they knew about their situation. "We have time to just listen to the patient and then they tell things they may not have told others. We plan the discharge, gather information on their home situation, it's a million little things we do." One mentor described setting up discharge for a complex, undernourished patient. "I got the dietician and RN together. We went through all the possibilities (shakes, appetite stimulants, etc.). The wife was involved and brought in food. This showed the nurse how to pull in resources and be creative in individualizing care. It's so easy to get tunnel vision."

Theme IV: Time

One of the key themes within planning was *time*. Mentors had time to look deeper into an assessment or create a plan because they did not have the urgency of a patient assignment. "As mentors, we are not hurried or stressed with our own assignments." Mentors took the time to stop a minute and think a situation through with a nurse, or to role play the next steps. They encouraged nurses to slow down and focus their thoughts. I tell them to "calm down", "we chat a little," and then proceed with a deeper assessment. Mentors noted that it took time to walk an RN through a situation, but new grads,

especially, liked the challenge of thinking it through. They said that the charge nurse would have acted as a mentor in this way if he/she had the time, but they were often too busy with patient flow activities. "Often the nurse doesn't have time to know first thing in the morning what the blood sugar was yesterday or to look for trends. We have time to review the case and go back 24 hours to be sure all is implemented." One mentor explained, "I ask questions, such as the patient seems to have a pacemaker: Is it a pacemaker or an AICD? If the RN doesn't know, I show him/her where to find it and why it is important to know. Or for the congestive heart failure patient, what is their ejection fraction? Generally, we go over what to look for that is diagnosis specific, especially on discharge." This process "helps the RN move from how to handle something like delirium tremens (DT's) from the angle of which prn medication to give, to the better question of how to handle the DT/behavioral problem to keep the patient safe and get him home. [It also helps] to further identify when something is not just a nursing question, so consults to psychiatry and social work can be made for a full plan of care."

Mentors proactively watched over a young Vietnamese speaking patient newly diagnosed with a lung nodule. They took the time to make sure the physician was communicating with the patient, the patient understood the plan, and ensured the social worker was involved. "I have a different understanding when I leave report than the primary RN cause I am more familiar with the patient, I'm there more often and check up everyday. I have time to read the labs, progress notes, everything." Mentors also had helped assess a patient's needs and options to create a plan for a confused patient, as opposed to merely adding a sitter when the patient became a safety risk. In another

situation, "there was a patient still NPO [nothing by mouth] for surgery and it was getting later in the day. I asked the nurse if the paperwork was ready and she said the physician hadn't been here yet". Upon closer look, the mentor found the NPO order was for that night, and there was no order for the surgery consent. Both the day RN and the previous night RN had read it wrong, but the mentor's expertise, along with the time to process undistracted by tasks, allowed her to put together that the picture didn't make sense and straighten it out.

Implementation

Theme V: Sharing Expert Tricks

Mentors also intervene, directly if necessary, but often through role modeling for the RN and the sharing of expert tricks to help increase efficiency. At times, the mentor helped improve time management skills, showing how to organize the work or document more efficiently. Other times, the mentor taught specific skills such as how to navigate starting a difficult IV. They mentioned sharing their "tricks of expertise and techniques" which they picked up from experience, "like when to pull the tourniquet, using heat, and how to feel the vein during IV starts". Another mentioned sharing "tricks to keep from contaminating a sterile field." Others shared rules of thumb, such as when deciding whether to call a physician, in general if it will change the management of the patient, call, if not, wait for rounds. One shared personal rules, like "how I prepare for problems ahead, such as carrying a magnifying glass to read medications in a code."

Theme VI: Capturing Teaching Opportunities During Patient Care Assist

Direct interventions, were turned into opportunities for teaching. "Even when I have become directly involved in care, such as helping someone get up in a chair, I used

the opportunity to talk about the patients' mobility and helped nurses to see through their misconceptions about what is a contraindication to getting the patient up, or discuss how to consider other options such as putting the bed into a chair position." A night mentor said she would assist with baths in the ICU to give her a chance to talk to the nurses; discuss the drips the patient was on, look at the skin and talk through the different ulcer stages, and talk about the various systems while doing a head to toe assessment. When dealing with experienced nurses who were more resistant to teaching from a younger mentor, one gained their respect by being more hands-on. She would "jump in and help, but still talk about why you are doing it." When necessary, mentors would give a professional nudge to a nurse "dragging their feet". When one nurse had not yet gotten a patient out of bed later in the day, the mentor declared, "Ok, we're doing it now; I'm coming in [the room to help]."

Theme VII: Instilling Confidence

Many of the interventions revealed the theme of *instilling confidence*, which wove throughout the interviews, whether through technical skills practice or role playing conversations. Mentors often enabled RNs to have a real-time dry run before encountering a difficult situation. "We practice in the medication room and then go into the patient room together, which increases their confidence. They used this approach to enhance their confidence and empower them to act, even outside the rules when necessary. "When presented with whether to hold a medication for say a borderline blood pressure, I ask them what they want to do and they usually stay conservative; hold the medication. They lean toward treating the numbers, not appreciating the safety of staying within that patient's norm. They assess the risk of giving the medication greater than

erring on holding and fear being judged as wrong. I walk them through the decision and why and they get it. It took time for me to learn its ok to give medications in certain situations. I was hesitant to give blood pressure medications while a patient was still on a nitroglycerin IV drip, but needed to in order to wean them off the nitro". For experienced nurses, mentors were available as a double check. Often, staff would call to "just run it by you". The RN gets reassurance from the mentor that they are on the right track in their thinking. Additionally, as one mentor remarked, "We are teaching them to become mentors to others eventually." Confidence was further built through preparation for potential emergencies. This included examples such as verifying suction equipment was in the room of a tracheostomy or cervical spine surgery patient. These activities were reinforced verbally, "I get them to think about the risks: how you will identify them, what equipment you need ready, and what you will do." Mentors reported frequent activity aimed at "finding more information", whether it was encouraging the RN to look up information on drugs or the mentor taking time to pull information off the internet when a nurse said they had no experience with a certain disease. One mentor noted that this "gives the RN power, knowledge is power, and makes the RN more comfortable in working with the physicians. This theme of equalizing power also played out as another mentor described how she interjected herself in a potentially volatile situation between a physician and staff nurse. Her stated goal was to send the message about what was acceptable behavior by role modeling how the RN could handle the situation to stop a potential escalation. Even the process of helping the RN prepare for rounds or a phone call to the physician to ensure the encounter was effective, served to equalize power as the nurse's confidence was increased.

Theme VIII: Role Playing to Strengthen Communication Skills

Role playing was most strongly evident when mentoring how to communicate succinctly to other clinicians and physicians. Mentors would prepare the RN for the situation they were about to or might encounter. Mentors encouraged the use of SBAR to clarify thoughts and needs and to express the crux of the situation. This was repeated often as a means to get a nurse to focus on what's important. Even when first trying to understand the problem the RN was having, mentors would ask them to use SBAR to organize their thoughts and calm down when "flustered". "The RNs learn over time which questions I will ask and next time, come to me with the answers ready. I see them start the process to critically think quicker. Questions like what meds are they on, what is your assessment, what have you done so far, what do you think we should do." Mentors walked nurses through how to check the progress notes to find out what the physician might already know, how and when to call the physician, leading with the most important point first and knowing what to expect in response.

Professional socialization. Role play and role modeling was also used to accomplish professional socialization, empowering nurses to give direct feedback for nurse to nurse accountability without blame, or to ask for help, "I had a nurse go get the crash cart without saying anything to others, when her patient was crashing." Mentors expected RNs to demonstrate accountability for their practice. "It is not acceptable to get report and not know certain things about a patient." Mentors did not take over, but role modeled their actions and served as coach and resource. This empowered the nurses to address the physician or patient in the situation. Role modeling was especially important when demonstrating how to talk to the patient to develop a relationship. "They see how I

interact in the room and we talk about it outside later." Mentors brought it all back to the person in the bed, including remembering the simple things, like lotion or massage. "It's not just the IV you hung they will remember." As one nursing assistant observed to a mentor, "I see you before you leave the room stopping and looking back at what could be missing and I should be doing that." One mentor spoke about how the coaching for socialization extended even to interactions with the charge nurse. She helped the RN get beyond the intimidation of the position. "I challenged the RN to ask the charge nurse three questions and it broke down barriers, just like talking through a call to the physician and prepping with SBAR prior. I didn't get here as a mentor without the help of experienced nurses mentoring me. You need these people in your lives to help you advance, they've made a high impact on my career."

Communication is also mentored for experienced nurses to strengthen professional socialization. "I tell them how to say something when English is not their first language, or how to approach a younger nurse over a problem, without offending them, helping them appreciate that what they say carries weight." One mentor found a nursing student extern in the ICU adjusting an IV pump with no preceptor in sight. She confronted the RN about her professional responsibilities for oversight. Though the nurse was defensive at the time, days later, the RN thanked the mentor saying, "you really made me think about my practice and accountability." Mentors have also served as the conscience of the unit culture, as an example, reframing the need for continuity in a particularly difficult, psychologically draining patient and family. "Think about the fact that this patient really needs you, the knowledge you have about him being quadriplegic and what it takes to motivate him, talk to him, and not take no for an answer." Again the

RN thanked the mentor later for "refocusing me at that moment". She commented that it made her think about the importance of continuity of care and how much a nurse brings back when having that baseline knowledge.

Evaluation

Mentors were most successful when they fully engaged the RN in the evaluation of care, both for the specific patient and in given situations. This contributed to the nurse's continued growth in clinical practice. Mentors taught in this realm, focused on best practice and led reflective practice experiences to help the RNs connect the actions taken, with the assessment, history and outcomes. Mentors also helped validate that the patient was receiving the appropriate care during rounds, looking for indicators of needs and following-up to ensure those needs were covered. "I would verify a Do Not Resuscitate order was documented and communicated to others, such as the telemetry technician, and that a new order had been written on transfer from the ICU, or from the ED when an older patient was admitted. I would also make sure the patient understood."

Theme IX: Teaching

As part of the evaluation, mentors performed the role of teacher. They were firm on an education approach that referred back to the policy and procedure, as a way to standardize practice, keep up to date with best practice, and prevent the erosion that occurs when teaching from memory. Much of the education was one on one and helped to increase awareness, allowing a nurse to learn from the expert's experience. Mentors provided specialty knowledge and brought the latest best practice to the bedside through patient safety checklists or core measure indicators. Looking at the core elements "helped stimulate RNs to think further on why we put the patient on certain drugs for instance."

The mentor teaching function was further aimed at promoting clinical inquiry and they would follow-up with staff over time, providing continuity to the learning process. Before mentors, RNs learned from co-workers, often the young teaching the young. Even with a stronger coworker who has an assignment or is in charge, more decisions and advice were shared on the run, without taking time to get full information. Learning from mentors was considered better because they went back to the policy, corrected technique and thought things through, with Socratic questioning. "I hone in on best practice daily. For a heart failure patient, I ask about the echocardiogram results. Over time the RNs get used to my asking and start passing it on in report. I changed their daily report practices. When I compared knowing the echocardiogram/ejection fraction to knowing the hemoglobin and hematocrit (H&H) on a GI bleed patient, then it hit home."

Mentors were also present to support an RN not exposed previously to a certain disease process/situation like a stroke extending. Rather than change the RN assignment when the patient had a change in condition, the mentor could provide needed real-time support. One mentor assisted with a newer nurse admitting a difficult, critically unstable open heart surgery patient. "I stayed until her questions were answered, she felt on top of it and I felt she knew what was actually going on with the patient and understood the standing orders." Mentors also "reinforced, daily, new things that were not habit yet, like the use of new technology, such as the I-bed (a hospital bed with computerized safety check features)." Mentors coached nurses through their first time with a procedure, like changing a PICC line, or giving certain meds, like chemotherapy, or setting up equipment, like chest tubes or a patient controlled analgesia pump (PCA). They were present when a nurse first attempted performing a risky procedure (like sheath pulls), and

served as validators for competencies, to ensure all was done according to the same processes. Mentors felt one critical value they offered was in teaching the newest technology at the bedside, as opposed to in a classroom. "You need to have it attached to the patient, [and] it needs to be your patient, so you really understand it."

Theme X: Evaluating Trends on the Unit

Part of the mentors involvement in evaluation was looping back to connect separate incidences with trends among the nursing staff on the unit to help drive performance improvement, as well as promote changes in policy and practice when necessary. At times, mentors had engaged in audits to document trends and help focus these efforts. The mentors had real-time insight regarding clinical care at the bedside which enabled them to bring to light knowledge gaps that might otherwise have remain hidden. "At the bedside you can tell if something new didn't stick." One mentor found that RNs were consistently weak on assessing chest tubes for air leaks, though they understood the concept. This led to inservices by the educators on chest tubes. Additionally, physicians would approach mentors when they identified trends for educational opportunities on the unit. Mentors presented many such requests to educators, APNs, or managers for targeted focused learning or performance improvement needs they identified. This could include bringing in best practice, new equipment, or processes. One mentor described involving an APN to add a medication to the Alaris IV pump profile in order to improve safety. Other times, the mentors themselves followed through. When one unit's fall rate was increasing, the mentors called other hospitals with better results and found out that the technique they found helpful was increasing awareness. The mentors "preached it and the rate dropped." Another mentor said, "If the

numbers say our urinary tract infection (UTI) rate is up, I do a story board on UTIs: how to prevent them, if you do x, y will happen, like if you leave the foley in 30 days, the likelihood is high the patient will get a UTI and this gets people talking about it. Data needs to be in the hands of the bedside nurse to be powerful." The mentor also bridged the span between best practice expectations and the reality of practice at the bedside. They were a voice to ensure policies were set which enhanced care and were not just an add-on requirement.

Theme XI: Reflective Practice

Reflective practice to evaluate care was mentioned by all mentors, but they acknowledged that the RN did not always have the time to engage fully in this process. When nurses were receptive and willing to learn, mentors reported being more motivated to teach. Mentors were able to disseminate lessons learned from incidences to a wider audience. One mentor told the story about a patient having neurological changes. Her husband told them that his wife "needed sugar", yet the staff pursued the possibility of the patient stroking, only to find out after a normal CAT scan that the blood sugar was 42 mg/dL. The mentor shared that learning opportunity in smaller staff groups. Another took time to sit down with RNs to go over blood sugar reports, showing them the trends over several days and analyzing it together to observe how it got back in control. Mentors led debrief sessions following an RRT or code, to understand what went right and what could have been done earlier. Occasionally, a mentor would be asked by the manager to shadow a struggling nurse to provide real-time feedback throughout the day to help them be more effective and efficient. Mentors discussed how critical it was to develop a personal relationship with the RNs, so they could be comfortable approaching the mentor to ask

questions and reflect on practice. The mentor's approach was equally important, "I didn't accuse them, I just wanted to know more information."

Identified Potential Issues with the Mentor Program

Approach. The mentors noted some potential risks in the role, especially when there was a lack of consistency in the designed approach from one mentor to the next. When asked how similar their actions were to those of other mentors, more than one replied, "I have no idea what the other mentors do." A consistent theme around approach was the feedback from staff nurses that the mentor program worked great when the mentor truly acted as a mentor, as opposed to just giving answers, which some thought could foster enabling and dependency on the mentor. Mentors acknowledged that when they fell into this situation, they also lost enthusiasm for the role. As one mentor lamented, "At one point, I gave up making them look up things, because I realized if I didn't give the answer, they wouldn't come to me. I was the calculator they didn't carry, the reference manual they didn't open." When mentors were able to refocus on an open, blameless approach, with Socratic questioning to elicit critical thinking, they felt the more successful.

Role. There was a time during the study period when mentors noticed nurses starting to document in the patient chart, "mentor aware" or "mentor informed or notified" suggesting a shift of responsibility onto the mentor. Some mentors felt this came as a response to the use of "resource nurses" who replaced the mentors when they were off, but were not trained as mentors. Staff described them as an extra pair of hands, as opposed to a true mentor, equally responsible for patient outcomes. The mentors felt

this blurred their role and gave it less respect or importance, which could impede their success.

Other. Other risk points included "unmentorable" nurses, often more experienced nurses not open to suggestions about their practice. Additionally, twelve hour shift schedules could interrupt continuity and hamper follow through of a situation when the nurse or mentor was off the next day. Frustration was also apparent when the mentors felt no one in leadership was holding staff accountable for the standard of care. Thus, the culture on the unit and support of management affected the ability of the mentor to accomplish their goals and was imperative to their success.

Summary of Results

The initial results reported elsewhere showed that the hospital wide measures of failure to rescue and HAPUs improved significantly from pre to post implementation of the clinical mentor program. Additionally, the hospital wide fall rate was approaching significance. In this study, it was found that the failure to rescue rate held the initial gain, but showed no improvement (or worsening) over the subsequent three years. The medical surgical HAPU rates continued to improve significantly over the next three years as did the hospital wide fall rates. The ICU HAPU rates did not change with the intervention. The qualitative findings validated that the mentors actions were aimed at improving these outcomes and identified other patient outcomes affected as well, such as improved patient satisfaction, early identification and intervention to prevent further deterioration of patient situations, prevention of medication errors, and prevention of negative outcomes from miscommunication among the healthcare team.

Chapter 5

Discussion of Findings

The goal of this study was to evaluate the long term impact of the clinical mentor program's effect on patient outcomes, as well as examine the program impact from the vantage point of those most deeply involved in the process, the clinical mentors themselves. Data results from both quantitative and qualitative approaches are interpreted, compared and contrasted in this chapter. The creators of the program set out to build a new nursing care model which would positively impact patient outcomes and nurse sensitive indicators, provide a safety net and oversight for patient care, and guide nurses to grow and develop toward expert level of practice. An initial paper reported results of the 6 month average rates immediately pre and post implementation and showed hospital wide failure to rescue and HAPU rates as the key significant findings ($p < .05$) using 2-sample, 2-tailed f-tests (Burrirt, Wallace, Steckel & Hunter, 2007). The focus of this current study was to evaluate the sustainability of the outcome impact, following the measures for a 3 year period and using Poisson regression, which is a more sensitive statistical procedure for count data of rare occurrences, such as these nurse-sensitive indicators.

Outcome Measures

Failure to rescue was considered to be a measure of vigilance, as it looks at the

prevention of death from complications acquired in elective surgical patients. The mentors spoke in the interviews about their vigilance over the patients on the unit, when following up on red flag cues from rounds, reports, and chart checks, looking for congruency from what they heard or read to what they assessed at the bedside. Data reported elsewhere showed a significant improvement in the hospital wide rate from pre to post intervention. (Burritt, Wallace, Steckel & Hunter, 2007). While there appeared to be a slight negative trend line over the next three years, the trend was not significant. The Poisson regression was essentially flat; however, since an improvement had already been shown for the six month average pre and post implementation, a continuing flat line would seem to reflect that the gain was held. The study results do not differentiate between statistical significance and clinical significance. Yet, to attain clinical significance, the hope would be for ongoing improvement, reflected in a downward trend. The study period took place at a time prior to the implementation of a stronger focus on outcomes and multidisciplinary approaches to the use of evidence-based practice and IHI clinical care bundles. This study also occurred prior to the start of supports such as the Rapid Response Team (mentor led), Intensivist and Hospitalist programs in the hospital. It is possible the mentors needed such comprehensive focus in order to better move the numbers.

In the current study, medical-surgical HAPU rates were separated out from ICU rates, and findings showed that the driver of the original significance was in the medical-surgical areas. The ICU rates did not change significantly from pre to post implementation of the mentor program. One important note was that while mentors were budgeted for 24/7 coverage on all units, the first three years during this study period,

there were only five clinical mentors covering 40 beds in the ICUs and the final year there were six. Therefore, the ICU had less than 50% of the desired mentor hours covered at any point, without sick time or vacation considered. Additionally, there were a high number of traveler nurses working in the ICUs during this period, which adds an additional strain on the mentors' ability to cover. On the other hand, the medical-surgical units had 84-100% coverage throughout the period. Studies in the literature have found the key to advancing care is to ensure the consistent availability of expertise, to fill gaps with a strategy to recognize and intervene when novices are in error, and to develop experiential learning in real-world situations (Ebright, Urden, Patterson & Chalko, 2004; Hanneman, 1996). The lack of coverage in the ICU may have influenced the disparity of results.

In the original pre/post database, fall rate changes were approaching significance ($p = .06$) when looking at a 6 month time period before and after implementation. Therefore, fall rates were included as an additional measure and showed a statistically significant decrease when measured from 11 months pre to the full 3 years post implementation, with about one and a half times less odds of falling after implementation of the program than before. Further, a significant negative trend continued post implementation, using Poisson regression. While the measure evaluated was the hospital wide fall rate, very few falls generally happen in the ICUs or elsewhere outside of the medical/surgical units. As noted before, the mentor complement was filled more effectively in those areas.

Program Environment

Patient and bedside staff RN characteristics were measured to determine the environment in which this program functioned. Surprisingly, no significant change in the

mean age of the patient population was found, despite common belief that the population at large is aging. With the large sample size ($n = 73,442$), even small differences in ages would have shown statistical significance. However, there was a significant increase (13.2%) in the percentage of admissions generated from the emergency department, suggesting a sicker patient cohort over time. It is also possible that this is only reflective of a decrease in access to care. Additionally, the bedside nursing staff showed a significant decrease in mean age over time (5.2 years of age). It is likely to be more difficult to prevent complications in an increasingly sicker patient population, when cared for by an increasingly younger nursing staff. Thus, it may be an even more clinically significant effect of the program that rates continued to decrease in all measures within this environment.

Presence of Experts

A critical factor in the program was to have an expert be the catalyst for staff nurse growth and patient safety oversight. Demographic variables were studied to determine how the mentor groups compared with the rest of the bedside nursing staff on criteria felt to be associated with expertise: age, education, certification and years of experience. However, there was no requirement in the job description of the mentor for a minimum educational level or certification. The results showed that in fact, there was a significant difference in mean ages between the mentors and bedside RNs after the inaugural year, as the bedside staff RNs were getting significantly younger over the study period and the gap in ages increasingly more significant.

Interestingly, while indeed older, the mentors did not have significantly greater years of experience. The major difference was that no mentors had less than one year of

experience, but 9 to 11 % of staff each year had less than or equal to one year of experience. Benner noted that expertise is a function of pattern recognition gained over time (Benner, 1983), and this was identified in much of the literature as up to five years in practice. The data for experience was obtained in large groupings of years and may have been more enlightening if actual years or a greater number of categories could have been examined. The hospital does not keep full statistics on years of experience and the data obtained for the bedside RN group was from self report of the respondents to the annual NDNQI nursing satisfaction survey (88% return rate). Thus, this may not be a true representation of actual years of experience. As Dunton and colleagues (2007) noted, experience and expertise are among the additional characteristics needed to be included in nursing workforce data.

Notably, the only significant difference in education was a reverse of the initial expectation, in that the bedside staff had a higher educational level than the mentor group. However, Hanneman (1996) had previously found no relationship between a nurse's level of advancement in practice expertise and their years of experience or educational preparation. Further, educational level alone did not explain decision-making ability in Lauri and colleagues' (2001) study; rather knowledge combined with experience was found to be important. The mentors did have significantly more certified nurses, which recognized a solid level of knowledge within their specialty. However, while the mentors recognized the importance of certification, as their own group increased to 80% certified, they did not appear to influence the general nursing population in this pursuit, as that group dropped over time to 32% certified. This could be a factor of a large increase in new graduates, yet, as the mentor numbers increased so

greatly, it could have been anticipated that the mentors would have carried the torch and promoted certification among the rest of the staff.

Still the question must be asked, if there was a more significant difference in educational level or experience, would the outcomes show a greater change? In the qualitative situational stories of the mentors, it was clear that this group of mentors did practice according to the expert qualities noted in the literature and summarized in chapter two. They also fulfilled Jasper's (1994) four tenets of the description of an expert as used in the literature. The interview narratives clearly showed the mentors were: recognized as experts by peers, managers and physicians; held a specialized body of knowledge and skill from both formal and informal (certification) education; practiced with highly developed levels of pattern recognition; and engaged in intuitive decision-making.

In the development of the conversion theory, Hanneman (1996) refuted Benner in that practice experience alone does not lead to expertise, instead active work on the bedside nurse's part with a beginning level of presence (bedside presence, social interaction and openness to learning) are needed in order for the catalyst (mentor) to be successful. The concept of deliberate practice, in which a nurse is self-directed and engaged in seeking learning opportunities, has been identified as a factor in the development of their expertise (Haag-Heitman, 2008). This study did not look specifically at the level of staff nurse engagement in the learning environment, however many mentor stories reflected an appreciation by staff for the efforts of the mentors. Mentors also noted a risk point in the program when nurses would not engage.

Besides being in the ICUs and medical/surgical units, the mentor program existed in the maternal child health unit and the emergency department. While these areas had some effect on the hospital wide measures evaluated, they were not strongly represented in the quantitative phase of the study. However, they participated in the qualitative interviews and were congruent with the rest of the mentors in the themes that emerged and actions they took to affect outcomes.

Qualitative Patient Outcomes

The study design used qualitative data to validate and expand on the primary quantitative measures, as well as examine the process of the intervention. When the mentors identified their effect on patient outcomes, through the descriptions of situations they were involved in, six themes emerged.

Indirect effect themes:

- I. Staff nurse growth & development
- II. Practice Improvement

Direct effect themes:

- III. Patient Satisfaction
- IV. Prevention of errors, avoidance of harm
- V. Improved pt outcome indicators
- VI. Effective communication.

Indirect Effect on Patient Outcome Themes

The strongest theme was that of providing an indirect affect on patient outcomes by engaging in real-time staff nurse growth and development. The focus of the mentor practice was to intervene in patient care scenarios by engaging and supporting the

primary nurse to take action in a situation. They described the use of well defined approaches from the literature to move practice along the continuum from novice to expert. They acted as guides (Ebright, Urden, Patterson & Chalko, 2004; Hanneman, 1996), and used role modeling (Benner, 1983) and reflection (Nelson, Apenhorst, Carter, Mahlum, & Schneider, 2004; Tanner, 2006). Additionally, in accordance with the critical companionship framework (Tichen, 2003 a), they engaged in consciousness raising and problematisation in their work with staff, which make the nurse's daily practice patterns explicit and show the connection to patient outcomes. Adding a measure to the study to look at the change in the practice level of the bedside nurses would be useful for future research to determine a quantifiable measure of success from these efforts.

Mentors also reported an indirect effect on outcomes by engaging in practice improvement. This was accomplished through policy and procedure review, equipment improvements and staff awareness activities around patient outcomes. This theme is in line with the emerging Clinical Nurse Leader (CNL) role, where front line engagement with the staff by the CNL informs performance improvement efforts aimed at improving patient outcomes (AACN, 2007). However, the CNLs are masters prepared, with training in microsystems improvement efforts and held more formally to this work. Increasing mentor exposure to the politics of process improvement may help them engage staff on the unit in this pursuit. The mentors currently seem focused more directly on one-on-one interactions and thus were aligned with monitoring and assisting with the roll out of process improvement activities more often than the development of them.

Direct Effect on Patient Outcome Themes

Four direct patient outcome effects were reported by the mentors. Patient satisfaction was identified, not as the mentor perception of their satisfaction, but as an outcome described by the patients themselves. Patients commented that with the mentors in place, they felt safe and that they had a team watching out for them and working together with them. A key success to the mentor's ability to find problems came from their unhurried, direct conversations with patients during rounds and the engagement of the patient in the care process.

Stories describing the real-time prevention of errors or avoidance of harm mirrored modeling done by Tourangeau (2005) suggesting that experienced nurses were quicker to detect early complication signs, rapidly respond and intervene, and led to more effective relationships with other health care team members. Prevention of error occurred with multiple examples of a mentor "catching" a patient deteriorating in time to intervene more effectively (and avoid a failure to rescue scenario) or interrupting an error about to occur. Additionally, they took the time to investigate problems, perform a deeper assessment or mine the chart for more information to gain a complete picture of the patient before determining actions for care. Mentors also watched out for staff and physicians taking shortcuts in their practice, which had the potential of undermining the safeguards in place. Multiple examples of interventions to decrease medication errors were described, but interestingly, the most striking theme around medications came from identifying medications the patients were taking at home that were not continued in the hospital, which were causing preventable complications. Today, The Joint Commission (TJC) has placed a strong emphasis on medication reconciliation during a hospital stay,

with which, at the time of this study, most hospitals across the country still struggled to comply. The mentors were essentially filling the gap from this struggle, both validating the need for such reconciliation and exposing the opportunities for improvement of the process at this particular hospital.

Proactive interventions were aimed at affecting the full range of patient outcome indicators, including the three measured in this study. They raised awareness and developed knowledge and focus on areas such as skin assessment to prevent HAPUs, environmental safety in the patient room to prevent falls, and quality assurance of the appropriate equipment and settings for treatments. Effective communication was the final outcome theme identified, an important goal in line with what TJC had long announced as the number one cause of sentinel events. Much of the mentors' time was spent on enhancing effective communication by role playing and role modeling effective communication with the healthcare team members and with patients.

Hanneman (1996) found that the result of expert practice on outcomes was the prevention of complications, the achievement of purposeful recovery and was demonstrated by humanistic care. Each of these factors was described in the mentor stories. Mentors identified their actions which directly impacted the patient outcomes addressed in this study. As noted, they spoke to surveillance activities and early intervention in patient deterioration scenarios which would decrease failure to rescue. They also described HAPU and fall risk preventative efforts to decrease those rates, performing comprehensive assessments, increasing staff knowledge in these areas and ensuring appropriate interventions were applied to match risk levels. Yet, a vast majority of their time was focused on more indirect means of improving care overall. These efforts

might take longer to affect a sustainable change in culture and subsequent improvements in outcome numbers. The true value of the mentor program by numerical determinants may yet to be realized.

The Process by Which Mentors Achieved Outcomes

Cues to Become Involved in a Situation

The theory behind the mentor program was to effectively provide oversight for care, acknowledging that non-expert nurses do not always know when they are in trouble and the mentors would need to seek out issues and opportunities for their involvement proactively. The mentors used report, rounds, chart checks and actual requests to get involved as the means to identify issues and find errors in progress or gaps in care. From the situations described these appeared to be highly effective avenues to bring forward hidden issues, errors and trends. Interestingly, mentors found many issues just by rounding on the patients and engaging them in a conversation about their care. Another successful approach came from validating what they heard in report or saw in the chart with their own physical assessment of the patient. They made liberal use of their expert pattern recognition skills to identify red flags of things that seemed out of place when rounding, reading the chart, or listening to a report and their follow through led to the avoidance of multiple errors. Many followed routines (like always looking at blood glucose levels out of range), and in some areas checklists, in order to ensure they covered common risk points. They also provided handoffs to each other, increasing their effectiveness on follow through of patient issues or the continuing development of a given staff member. An open approach, good listening skills and the willingness to enter into a situation served to provide the oversight that was expected.

Processes Used to Affect Patient Outcomes

Mentors were asked to describe situations in which they affected patient outcomes and the stories were analyzed using situational analysis, in order to understand the processes they utilized. By using the stories of actual incidents, it was hoped that the researcher could gain a richer database from which to pull out the themes of their activities. Eleven themes emerged as the mentors worked with nurses in all phases of the nursing process and were presented in that context in chapter four.

- I. Deeper Assessment
- II. Evaluating Trends in a Situation to Connect the Dots
- III. Involving the Patient
- IV. Time
- V. Sharing Expert Tips
- VI. Capturing Teaching Opportunities During Patient Care Assist
- VII. Instilling Confidence
- VIII. Role playing to Strengthen Communication Skills and Professional Socialization
- IX. Teaching
- X. Evaluating Trends
- XI. Reflective Practice

When analyzed as a whole, there seemed to be three overarching areas of focus for the mentors in their work. The first was improving effective communication, which includes the themes: III, Involving the patient; VII, Instilling confidence and VIII, Role playing to strengthen communication skills and professional socialization. The second

area of focus was teaching, covering themes: V, Sharing expert tips; VI, capturing teaching opportunities during patient care assist; IX, Teaching; X, evaluating trends and XI, Reflective practice. The final area of focus was that of taking time and looking deeper, covering the remaining themes: I, deeper assessment; II, evaluating trends in a situation to connect the dots and IV, time.

Effective work relationships, themes III, VII, and VIII. Building effective communication skills was a very strong theme within the mentors' realm of involvement. Much work has been focused nationally on this issue alone, as numerous incidents have pointed to the lack of effective communication as the root cause of serious errors. Efforts such as time outs in the surgery process, rapid response teams, rounding and handoff efforts, SBAR type communication formats and crew resource management (team training) all have a major component aimed at improving communication among the healthcare team. Work relationships have been found to be a key driver of the development of nursing expertise as well, stronger than years of experience or education and stronger than structural work empowerment (opportunity, support, resources and information) (Roche, Morsi, & Chandler, 2009). The mentor stories spoke directly to their work on developing communication skills to improve work relationships, particularly with physicians, as they role played conversations, focused on identifying salient points to communicate and even introduced new staff to physicians to help spearhead relationships. These activities spread further to other potentially uncomfortable interactions, starting first with engaging the patient, but also to interactions with charge nurses, and other healthcare team members. A sub theme of professional socialization

emerged in this process, whereby mentors helped improve the overall culture on a unit, holding each other to a high standard of care.

When a nurse lacks confidence, it is difficult to interact effectively with others to achieve patient care goals. The theme of instilling confidence aimed to mitigate this barrier. Mentors practiced skills with RNs before they performed them, brought forward new knowledge to empower them in their practice and interactions, and ensured they were prepared for potential emergencies. When working with experienced nurses, mentors validated their critical thinking process as they collaborated on decisions and plans. Additionally, mentors engaged patients directly, truly listening to the patient, and created a team approach, which patients commented that they valued and helped make them feel safer. These activities ultimately helped strengthen work relationships and interactions, resulting in a higher quality of care, as the team worked from the same page, with diminished opportunity for critical information to be lost or missed in order to better serve the patient.

Teaching, themes V, VI, IX, X, and XI. Teaching was another large component of activities to achieve better outcomes. Mentors engaged the staff in learning opportunities on a daily basis, bringing new information to light and reinforcing practice according to policy and procedure, as well as sharing their expert tips they had picked up along their career. They took advantage of realtime bedside opportunities, such as teaching when a nurse was faced with a new disease or treatment process or just reinforcing assessments and environmental scans while assisting with patient care. Haag-Heitman (2008) confirmed the importance of having social models and mentors as key environmental factors in the development of nursing expertise. She found that central to this

development is risk taking in a safe environment where immediate feedback on performance is available, and the mentors universally described this as part of their process. They created a learning environment on the unit, regularly challenging staff to continue to grow professionally. They engaged staff in reflective practice, reviewing difficult situations after the fact or sharing the experiences of others in order to spread the learning opportunity. By having this exposure at the bedside, mentors were able to use the trends they witnessed while working with staff to drive performance improvement initiatives and planned educational offerings. One identified barrier to this process was the high activity level occurring on the units and the consideration of a more defined and protected time set aside for reflective practice with the mentor guide might be warranted.

Taking time to be thorough, themes I, II, and IV. Time was a critical theme for the process of performing the mentor function in relation to affecting patient outcomes. The set up of the program which kept the mentor out of a patient assignment and free to pursue deeper assessments as well as thoroughly investigate clinical issues was critical to nearly every story, and provided the motivation and opportunity for the oversight of care. Having this time encouraged rounding and the engaging of patients to identify problems and validate plans, from which many potential errors were avoided. To the extent that they could slow down time for the RN as well, they were able to engage them in focusing on salient issues in a situation or in reflective practice opportunities. To the extent that they couldn't, they served to connect the dots by investigating trends for the RN, looking deeper into a clinical issue, or identifying errors in progress. The mentors were able to mobilize other resources as needed to bring creative solutions to the bedside for patient care.

However, generally the activities in this area of focus also required the level of expertise the mentors brought to the situation. A novice nurse without an assignment would not be able to differentiate salient data points, or have the pattern recognition from which to draw to identify what is out of place. As experts, mentors routinely performed deeper assessments, asking why something was wrong, as opposed to merely identifying that it was and as experts do, not always trusting the numbers or the obvious. They were truly able to expand their expert skills by putting the whole picture together in a situation, including trends in labs, recurring complications, etc., to affect the ultimate outcome. An interesting observation from one of the mentors was that their involvement served to allow for a more controlled and organized response to a patient deterioration because cues were identified earlier, before an emergency ensued.

Conclusion

Developing relationships that enhance communication around patient care, creating a learning environment to continually grow in practice, and having the time and ability to thoroughly assess what was going on with the patients all served to directly affect patient outcomes. These were the areas of focus for the mentor program as noted in this study. While the heavy commitment of resources and funds may affect the ability for others to achieve such a program, the lessons learned from this study on how hidden issues were identified and which approaches led to improved patient outcomes should be translatable, in order to create an environment conducive to attaining better outcomes.

Research Strength and Limitations

Quality of the Data

Much was learned about the use of outcome data in the research process through this study. Any study looking at an intervention effect on patient outcomes risks influence from multiple factors, including the patient, physician, and nursing staff as well as hospital structural or procedural factors. Identifying exact elements needed up front and collecting the data real time as the study progresses would be preferable to retrospective review.

One interesting finding was that indicators such as failure to rescue are highly complicated computations, which essentially require proprietary software to determine, due to multiple inclusion and exclusion criteria as well as risk adjustment requirements. Yet, attempts to use the AHRQ online software presented overwhelming challenges in mining the data and placing it in a readable format. Interestingly, when this study data was run on two different proprietary software programs, each reporting to follow the AHRQ definition, different numerators and denominators were obtained. There were even cases included that were not within the baseline population for this measure. Further, when using proprietary software, data is routinely dumped after a period of time and for this study resulted in the loss of the pre-implementation data for the failure to rescue measure. These factors severely limited the confidence in the failure to rescue measure itself for usefulness as a measure deemed nurse sensitive.

Other Limitations

This program occurred in one hospital, limiting the ability to generalize results, and was implemented in all units simultaneously, with no control unit. Retrospective data from administrative datasets limited the factors available to measure. The study also did

not measure the strength of the individual mentor's practice, though the stories did show that they had achieved expertise in their thinking processes. There is an added limitation in that the effect of the MCH and ED mentors were not readily apparent in the indicators followed, nor do they directly connect with any NQF nurse-sensitive indicators. For this study, they were included in the qualitative component in order to give them a voice and attempt to capture their effects.

Measures used were hospital wide, which limits the ability to see if one unit was more or less successful than another. However, this was necessary as the measures are count measures for the most part of rare events and smaller breakdowns of the data would limit the "n". In addition, while falls and failure to rescue generally happen on one particular unit, HAPUs can be multi unit dependent as a function of the prevalence definition. A HAPU can be identified on a medical-surgical unit during the prevalence study, which actually occurred prior to transfer from the ICU. Thus the hospital wide focus was an important start.

Finally, social desirability may have been a confounding factor in the mentor interviews. Interviews were focused on actual situation descriptions, as opposed to open ended questions in order to help mitigate this effect. The use of situational analysis served as an effective approach to the qualitative data and resulted in a rich understanding of the processes involved. Despite these limitations, the study reported here provides new knowledge for expert/non-expert practice and the effect of a unit-based catalyst or guide on patient outcomes, as well as the processes used to attain that effect.

Implications for Nursing and Further Research

Current efforts around health care reform will only intensify the need for expert nurses at the bedside, as the quality of care received in hospitals receives stronger scrutiny. Pressure has been greatly increased by publicly reported patient outcomes, as well as the end of reimbursement for hospital acquired conditions or readmissions within 30 days post hospitalization. Therefore, it is critical to identify new models of care that affect the bottom line in quality and support the nurse at the bedside to develop their expertise in giving effective, evidence-based care. The mentor program in this study was one attempt to do so. However, the results also brought out effective means for finding problems and approaches to help support the bedside nurse that might be incorporated by other nursing roles to increase the quality of care. Additionally, this study revealed an effective means of keeping seasoned, expert nurses involved at the bedside, who might otherwise be lost to the profession as they near retirement.

Future research on this mentor program could look to separate out the mentor/patient/staff characteristics and outcomes for the ICUs from the medical surgical units, to better identify other characteristics that influenced the patient outcomes. Measurement of the change in practice levels of the bedside nurses would help quantify the effect of the program on staff development. General research on the quantitative measures of patient outcomes and comparisons of different models of care on outcomes and cost will be important to position the nursing profession in a leadership role for creating the changes required in health care delivery.

Conclusion

This study has added to the general knowledge of expert/non-expert practice and the effect of a unit-based catalyst or guide on patient outcomes, through work with the primary nurse in direct interventions as well as through staff nurse growth and development. For the evaluation of this clinical mentor program, positive effects on patient outcomes were shown. Failure to rescue held the gains of the original improvement, but did not continue a downward trend, medical/surgical unit HAPUs continued a significant decline, and falls were shown to be significantly decreased when measured further out. The qualitative examples from mentors validated their effect on patient outcomes and outlined the processes used to achieve those outcomes. Further enhancement of the program may be warranted to increase the clinical significance and outcome results going forward.

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Appendix B

Scripps IRB Approval Form

y Scripps

Office for the Protection of Research Subjects

Scripps IRB

11025 Worth Tc.mtf Rncs Roail
Mittl 2FD
La Jolla. CA92037

Approval Notice

Investigator: Cynthia Mary SteckeJ. RN, MSN
Department: Scripps Memorial Hospital La Jolla
Project Title: The Impact of a Clinical Vector Program on Patient Outcomes
Protocol No: LAJ-09-6016
Risk Category: Minimal Risk

Type of Review: **Expedited - NEW**

Your research project indicated above was reviewed and approved by an IRB officer on the review date stamped above. Approval expires **12 months** from this date. Approval carries with it the understanding that you will inform the Committee promptly should a serious adverse reaction occur, and that you will make no modification to the protocol or consent form (if applicable) without prior IRB approval.

The IRB may suspend or terminate its approval of research that is not conducted in accordance with the requirements set forth by the committee that has been associated with unexpected serious harm to subjects.

Thank you for your cooperation.

(Informed Consent dated 11/19/09 and Interview Guide for Mentor Interviews dated 12-18-09)

Signature applied by Barbara G. BIG on 01/31/2009 06:36:03 PM PST

IRB Officer

Appendix C

IRB NUMBER: LAJ-09-8016
 IRB APPROVAL DATE: 1/30/2009
 IRB EXPIRATION DATE: 1/29/2010

LAJ-09-8016
 Clinical Mentor Program study

CONSENT TO PARTICIPATE IN RESEARCH

The Impact of a Clinical Mentor Program on Patient Outcomes

Investigator: Cindy Steckel, RN, MSN 858-626-7655

Research Site: Scripps Memorial Hospital La Jolla

Before you start reading about this research, please read the California Experimental Subjects' Bill of Rights, which is located on page 4 of this document.

Why is this study being done?

You are being asked to take part in this study to help us learn more about your effect on outcomes beyond what the quantitative numbers tell us. If you participated in the mentor log data collection last summer, this will be looking at similar information, but this time in an interview format. Before you decide if you want to be in this study, it is important that you read the following information and ask as many questions as necessary to be sure that you know what you will be asked to do.

The purpose of the study is to examine the long-term effect of the new care model, instituting a clinical mentor program, on nurse-sensitive patient outcomes. The outcomes will include failure to rescue and hospital acquired pressure ulcers, as well as outcomes not quantified in these indicators. In addition, the study will explore the process by which patient outcomes are affected.

How many mentors will be involved in the study?

About 30 mentors will take part in the study.

What is involved in the study?

For each participant, the study will consist of one, hour long interview one-on-one with the researcher. You will be asked to sign this consent. You can stop participating at any time during the interview.

During the interview, you will be asked to share your thoughts on situations where your intervention kept a patient safe that otherwise may not have been. There doesn't have to be a direct cause and effect. Your intervention may not directly affect one particular patient (if, for instance, it was a teaching moment to help a nurse learn something for the future that had you not corrected in their mind may have led to harm to a future patient). There also does not have to be an error or harm involved, it could be that your intervention made for a better solution or was a proactive move.

You will be asked to describe the incident, what brought it to your attention, what action you took and what outcome occurred (or what potential harm was avoided).

Audiotape

As part of your participation in this study, you are also being asked to allow the researcher to audiotape the interview. Audiotapes will be used to record your comments for later review because it is not possible to write down everything you say during the interview. The information collected in the study

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will be stored in a locked and secure location. The audiotapes will be destroyed within 3 years of completing the interview.

Please indicate below whether or not you agree to have the interview audiotaped by writing your initials beside your choice.

_____ Yes, I agree to have the _____ No, I do not want the
 interview audiotaped. interview audiotaped.

What are the risks of the study?

The study has been approved by the Scripps and USD IRBs. There are no risks to patients, as this study will look at secondary data analysis of de-identified data from past patients.

The interview carries the risk of participant fatigue and the potential for a negative patient incident coming forward. If this should occur, you would be encouraged to follow the usual hospital process for occurrence reporting. Tape recording might make you feel uncomfortable. You don't have to answer any questions that you don't want to. Any information we obtain from you that can be identified with you will stay confidential. It will be de-identified in the process of analysis. Mentor participation is voluntary. Your decision to become involved or not will in no way reflect upon your employment or in any way affect your relationship with Scripps or the leadership team.

There might be other risks from participating in the study that we do not know about. For more information about the risks we are aware of, please ask the researcher.

Are there benefits to taking part in the study?

You may not get any personal benefit from being in this research study. We hope this study can help guide development of the mentor program and/or other similar programs to improve patient safety at the bedside and help close the nurse expertise/patient need gap.

What about confidentiality?

All information identifying you will remain confidential. All databases are secured with passwords restricted to authorized study personnel. All study materials will be kept in locked files and will be available only to authorized study personnel. The audiotapes will be destroyed within 3 years of completing the interview and the study data will be destroyed within 5 years. The result of this study may be published in scientific journals or presented at scientific meetings, but you will not be identified or described in such a way that anyone could identify you.

What are the costs?

There are not costs to you if you decide to participate in this study.

Who do I call if I have questions or problems?

For questions about the study, please call the researcher Cindy Steckel, at 858-626-7655.

What are my rights as a research subject?

Taking part in this study is voluntary. You may choose not to take part or you may leave the study at any time. No one outside the research study will be informed of your decision to participate unless you

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decide to reveal it. If you agree to participate, you are free to not answer any individual questions. You are also free to withdraw your consent and discontinue participation at any time. If you have any questions about your rights or to report a research related concern you may call the Scripps Office for the Protection of Research Subjects at 858-652-5500. This is a group of people who review the research to protect your rights.

Signature and Consent to be in the Study.

Your signature below means that you have read the above information about the study "The Impact of a Clinical Mentor Program on Patient Outcomes", and have had a chance to ask questions to help you understand what you will do in this study and how your information will be used.

Your signature also means that you have been told that you can change your mind later if you want to. Your signature below indicates your consent to your participation in this study.

Name of Participant _____ Date _____

Signature of Participant _____ Date _____

Signature of person who explained consent form _____ Date _____

IRB NUMBER: LAJ-09-8016
 ^>- Scripps IRB APPROVAL DATE: 1/30/2009
 IRB EXPIRATION DATE: 1/29/2010

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EXPERIMENTAL SUBJECT'S BILL OF RIGHTS

If I am asked to consent to be a subject in a research study involving a medical experiment, or if I am asked to consent for someone else, I have the right to:

1. *Learn the nature and purpose of the experiment (also called "study" or "clinical trial").*
2. *Receive an explanation of the procedures to be followed in the study, and any drug or device to be used.*
3. *Receive a description of any discomforts and risks that I could experience from the study.*
4. *Receive an explanation of any benefits I might expect from the study.*
5. *Learn about the risks and benefits of any other available procedures, drugs or devices that might be helpful to me.*
6. *Learn what medical treatment will be made available to me if I should be injured as a result of the study.*
7. *Ask any questions about the study or the procedures involved.*
8. *Quit the study at any time, and my decision will not be used as an excuse to withhold necessary medical treatment.*
9. *Receive a copy of the signed and dated consent form.*
10. *Decide to consent or not to consent to a study without feeling forced or obligated.*

If I have questions about a research study, I can call the contact person listed on the consent form. If I have concerns about the research staff, or need more information about my rights as a subject, I can contact the Scripps Office for the Protection of Research Subjects, which protects volunteers in research studies. I may telephone the Office at (858) 652-5500, 8:00 a.m. to 4:00p.m. weekdays, or I may write to the Scripps Office for the Protection of Research Subjects, 11025 North Torrey Pines Road, Suite 200, La Jolla, CA, 92037.

By signing this document, I agree that I have read and received a copy of this Bill of Rights.

Signature of Subject or Legal Representative

Date

California Health & Safety Code, Section 24172

1/29/2009

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Appendix D

Clinical Mentor Interview Guide

Please bring to mind situations where your intervention as a clinical mentor kept a patient safe that otherwise may not have been. There doesn't have to be a direct cause and effect. Your intervention may not directly affect one particular patient (if for instance it was a teaching moment to help a nurse learn something for the future that had you not corrected in his/her mind may have led to harm to a future patient). There also does not have to be an error or harm involved, it could be that your intervention made for a better solution or was a proactive move. Please keep all specific patient and staff names out of the story.

I would like you to:

- Describe the incident
- Identify what brought it to your attention (ie: RN approached you with a question, you found on rounds, you found looking in charts, you overheard a conversation, MD pointed out to you, etc.)
- Identify your thought process that led to the conclusion of what action to take
- What action you took
- What outcome occurred if there was a visible outcome or what potential harm to the patient was avoided.

Appendix E

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from Joe Tonzelli <Tonzellj@ajj.com>
tocsteckel-06@sandiego.edu

date Thu, Apr 8, 2010 at 8:16 AM
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