



UNF Digital Commons

UNF Graduate Theses and Dissertations

Student Scholarship

2013

The Impact of the Clinical Nurse Leader/Navigator on Clinical Outcomes and Patient Satisfaction

Diane Smith Raines
University of North Florida

Suggested Citation

Raines, Diane Smith, "The Impact of the Clinical Nurse Leader/Navigator on Clinical Outcomes and Patient Satisfaction" (2013). *UNF Graduate Theses and Dissertations*. 479.
<https://digitalcommons.unf.edu/etd/479>

This Doctoral Project is brought to you for free and open access by the Student Scholarship at UNF Digital Commons. It has been accepted for inclusion in UNF Graduate Theses and Dissertations by an authorized administrator of UNF Digital Commons. For more information, please contact [Digital Projects](#).

© 2013 All Rights Reserved



THE IMPACT OF THE CLINICAL NURSE LEADER/ NAVIGATOR ON CLINICAL
OUTCOMES AND PATIENT SATISFACTION

by

Diane S. Raines

A project submitted to the School of Nursing
in partial fulfillment of the requirements for the degree of

Doctor of Nursing Practice

UNIVERSITY OF NORTH FLORIDA

BROOKS COLLEGE OF HEALTH

December 2013

Unpublished work c. Diane S. Raines

Certificate of Approval

The project of Diane S. Raines is approved: Date _____

Date _____
Pamela S. Chally, PhD, RN
Committee Member

Date _____
Lillia Loriz, PhD, GNP, BC
Committee Member

Date _____
Carol Ledbetter, PhD, FNP, BC, FAAN
Committee Chairperson

Accepted for the School of Nursing

Date _____
Lillia Loriz, PhD, GNP, BC
Director, School of Nursing

Accepted for the College

Date _____
Pamela S. Chally, PhD, RN
Dean, Brooks College of Health

Accepted for the University

Date _____
Len Roberson, PhD
Dean of the Graduate School

Dedication & Acknowledgements

Sincere appreciation goes to my committee members, Dr. Pamela Chally and Dr. Lillia Loriz who encouraged me to begin this journey and were there throughout the process to help and advise. My deep gratitude to Dr. Carol Ledbetter, committee chair, who served as teacher, cheerleader, mentor and editor; without her help I could not have been successful.

Thank you to my professional colleagues who provided encouragement, information, advice and role modeling, Dr. Kristin Vondrak and Dr. Peggy McCartt. True appreciation to our performance improvement analysts who helped identify, analyze and display the data from the project, Jarret Dreicer and Matt Myers. I am blessed to work in an organization where colleagues encourage each other's development and celebrate successes. Special thanks to my friend, mentor and boss, John Wilbanks, for his encouragement and support.

Finally, no one accomplishes major life goals without the support of family and friends. My love and appreciation to my husband, Don, and sons, David and Edward, for their encouragement, pride in my accomplishment and tolerance of many take-out dinners.

Table of Contents

Abstract	vi
Chapter One: Introduction	8
Environment.....	8
Project Background.....	14
Problem.....	22
Project Purpose and Description.....	22
Definition of Terms.....	24
Chapter Two: Review of Literature	28
Sources and Search Process.....	28
CNL/Navigator Review of Literature.....	29
Impact of Staffing on Outcomes Review of Literature.....	36
Summary.....	41
Chapter Three: Methodology	42
Design and Sample	42
Setting	43
Methods.....	43
Data Collection	44
Data Analysis and Summary.....	46
Chapter Four: Results	47
Service.....	47
Never Events.....	50
Core Measures	52
Readmissions	54
Summary.....	55
Chapter Five: Discussion	56
Service.....	56
Never Events.....	57
Core Measures	58
Readmissions	59
Literature Relevance	60
Limitations	65
Next Steps	66
Conclusion	69
Appendices	
A: Hospital-Acquired Conditions	71
B: Vision for the Future	73

C: Clinical Nurse Leader/navigator Performance Plan.....	75
D: Model of Care Talking Points.....	78
E: Data Collection Tool	83
F: Literature Reviewed	84
G: Completed Baseline Data.....	99
H: Completed Implementation Data	100
I: Time A to Time B Comparison Data	101
J: Communication with Staff	102
K: Communication with Leaders	106
References.....	108
Vita.....	114

Abstract

In an era of value based purchasing and healthcare reform, hospitals face the challenge of delivering high quality care in an environment of diminishing resources. This performance improvement project describes the use of master's prepared nurses on medical surgical units to improve quality and patient satisfaction. The setting was five medical surgical units in a 200+ bed hospital in the southeastern United States. Declining resources necessitated an increase in the nurse to patient ratios on the units (from 5:1 to 6:1). The project involved the modification of the model of care through the change in nurse/patient ratios and the addition of master's prepared nurses to coordinate and supplement the care of the staff RNs for complex patients. While inconclusive, the literature review confirmed the impact of master's prepared nurses on quality metrics and did not conclusively confirm that delivering high quality, safe care was not possible with nurse/patient ratios of 1:6. The goal of the project was to determine if the presence of the master's prepared nurse could mitigate the changes in ratios and produce high quality and satisfaction outcomes. Measures of success were drawn from archived standardized quality measures in the realms of service (HCAHPS questions), patient safety (CABSI, HAPU) and quality outcomes (core measures and 30 day readmissions). The project design was a retrospective, one-group pre-post design looking at two six-month intervals—before and after project implementation. Results demonstrated sustained or improved quality in six of ten measures. Highest positive impact was in readmissions and nurse sensitive indicators. The most negative results were in patient satisfaction. Modifying the model of care is an iterative process requiring continued evaluation and changes to improve outcomes. Results of this project supported the further evaluation of staffing and expansion of the number of master's prepared nurses on medical surgical units.

Keywords: Clinical Nurse Leader/navigator, quality, service, model of care, performance improvement, staffing

Chapter One: Introduction

In the era of value based purchasing, healthcare reform and a lagging economy, hospitals and health systems face the challenge of delivering high quality care in an environment of diminishing resources. While there is much in the literature regarding the need for increasing nurse to patient ratios or nursing hours of care to potentially improve quality, there has been little mention of the pressure to reduce labor costs, which is impossible to do without addressing nursing, the largest component of the healthcare labor force. John Rowe, MD, professor of health policy and management at Columbia University Mailman School of Public Health, has described the greatest challenge for healthcare delivery systems today being “improving the value of care by improving quality at no additional or lower costs” (American Association of Colleges of Nursing, 2013, p. 4). Chapter one addresses the current healthcare environment and describes a project designed to meet Professor Rowe’s challenge.

A Challenging Environment to Improve

In 1999 the Institute of Medicine (IOM) published *To Err is Human: Building a Safer Health System* which brought to light the impact of medical errors in American healthcare--an estimated 98,000 unwarranted deaths annually and billions of dollars of unnecessary costs. The report revealed a broken, fragmented, chaotic healthcare delivery system where practitioners were either unaware of or silent regarding medical errors. The report called for a national focus on patient safety defined as “freedom from accidental injury” (Institute of Medicine, 1999, p. 4). There were several recommendations regarding mandatory data reporting, education of clinicians and healthcare leaders and the creation of a culture of safety by implementing safe practices and systems within hospitals. The impact of *To Err is Human* was an increased national focus on

patient safety, patient satisfaction and quality outcomes. As an example, a search of Google Scholar reveals more than 1,200,000 references for patient safety and another 1,170,000 for patient quality published since 1999.

The IOM followed with *Crossing the Quality Chasm: A New Health System for the 21st Century* (2001) which focused specifically on the improvement of healthcare quality. Fragmentation and lack of process improvement were again highlighted with a call for national healthcare redesign to improve quality and reduce costs. The report suggested healthcare practitioners and systems pursue the aims of safe, effective, patient-centered, timely, efficient and equitable health care (IOM, 2001, p. 6). Further recommendations included using evidence-based decision making, anticipating patient needs rather than reacting to situations and collaboration among practitioners. The report also encouraged congress and insurance payers to align payment practices with quality improvement and outcomes. The IOM called upon the Agency for Healthcare Research and Quality (AHRQ) and the Health Care Financing Administration, a forerunner to the Centers for Medicare and Medicaid Services, to establish a national quality research agenda which would help move the country into the increasingly complex world of 21st century healthcare delivery.

The latest IOM report *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America* (2012) articulated that healthcare has improved little in the thirteen years since *To Err is Human*. Between 2005 and 2011, the IOM hosted a series of workshops and roundtable discussions to solicit input around two identified imperatives—managing the ever-increasing complexity of healthcare and curbing the ever-escalating costs (IOM, 2012, p. 7). Once again, improving processes and collaboration between practitioners and patients was stressed. The report illustrated the complexity of healthcare decision making with the example of

heart disease and cancer treatment. A fourfold increase in research publications on these topics has created the paradox of significant advances in diagnosis and treatment of these conditions, but so much information that it is a challenge to translate the knowledge into practical care applications. The situation is compounded by the aging population with multiple underlying chronic conditions, as well as acute episodes, requiring care. This combination is both complicated and expensive to treat for all types of health care providers, especially physicians and nurses. As care has become more fragmented by specialization, communication between providers has become more difficult and can be a source of error and poor quality. The adoption of the electronic medical record has further contributed to fragmentation. It is possible for multiple specialists and providers to care for a patient without actually talking to each other. They can “communicate” through the EMR. The vision described in the IOM report included a commitment to a culture of teamwork, collaboration and adaptability within organizations and across the community and the need to align payment with quality and value.

While the IOM has been a voice for improvement it is not the only agency influencing the healthcare environment. The Joint Commission (JC) aligned with IOM recommendations and established the National Patient Safety Goals (NPSG) in 2003 as part of its accrediting process. The goals are developed by a multidisciplinary panel and updated to address quality and safety issues reported by hospitals and other agencies. The JC goals are prescriptive and designed with little room for variation. Most of the goals impact nurses in their delivery of care and, if followed, should help prevent errors and improve quality. Included in the NPSGs are improved provider communication goals and implementation of evidence-based practices to prevent infections (The Joint Commission, *2012 National Patient Safety Goals*).

Financial Alignment with Quality Outcomes

The Centers for Medicare and Medicaid Services (CMS) are aggressive proponents of healthcare reform. As the governmental payer for just under half of all health care in the United States, CMS has a vested interest in quality outcomes and escalating costs. The World Health Organization (WHO) estimates that 15.3% of the United States gross domestic product (GDP) was spent on healthcare in 2006, and by 2020 it will be over 20% if costs continue unchecked (WHO, 2009, p. 114). The Advisory Board Company in Washington, DC, reports that the Congressional Budget Office estimates the gross domestic product (GDP) will increase 4.4% over the next ten years while Medicare and Medicaid spending will increase 14.4% (Fontana, 2012). CMS is not just the financier of healthcare; it also certifies providers through national standards and regulations. Over the past few years CMS has been shaping healthcare through the advancement of research, the implementation of innovative ideas (e.g., accountable care organizations and bundled payments pilots) and the direct linking of payment to quality and satisfaction measures. In support of the 2010 Affordable Care Act, CMS has three broad-reaching acute care payment plans designed to bend the cost curve: (a) value based purchasing (VBP); (b) hospital acquired condition (HAC) penalties; and (c) 30-day readmission penalties. All three of these programs have incorporated IOM recommendations, Joint Commission requirements and evidence-based practices into their structure.

VBP addresses publically reported quality and service elements. The quality elements are clinical processes that are evidence based and consistently measurable across acute settings. The current twelve process measures pertain to the diagnoses of acute myocardial infarction (AMI), congestive heart failure (CHF), pneumonia (PNA), healthcare associated infections (HAI) and surgical care improvement (SCIP). There are eight patient experience measures as

measured by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. The HCAHPS survey was designed by AHRQ to be used by CMS to evaluate patient and family experiences with healthcare. HCAHPS dimensions include communication with nurses and doctors, responsiveness of staff, pain management, communication about medicines, cleanliness of environment, discharge information and overall rating of the hospital. Performance on the VBP measures is available for viewing on the CMS website (Hospital value based purchasing, 2013). While the data lags by several months, the message to consumers is clear-outcomes are transparent and hospitals are judged relative to their performance against standardized quality measures and compared to each other. CMS plans to add mortality measures in 2014 and efficiency measures in 2015 to keep moving performance forward.

VBP involves a system of withholding 1% of all Medicare inpatient payments for hospitals and health systems and comparing their outcomes at the end of the year for bonus potential. Bonuses are calculated with 70% based on clinical process measures and 30% on patient experience scores. Bonuses will be given for high performance scores or for a certain degree of improvement over baseline. CMS estimates that 50% of all hospitals will fall short of the bonus and the other 50% will receive it through this redistribution of payment mechanism (Fontana, 2012). The impact of VBP is significant. At the health system where this project is conducted, a 1% Medicare withhold represents almost \$3 million at risk. Over time CMS will increase the percentage of payment withheld to further elevate the impact of poor quality on hospital reimbursement.

CMS began posting hospital readmission rates for AMI and CHF in 2009. The data demonstrated that 19.6% of all Medicare patients were readmitted within 30 days of hospital

discharge at a cost of \$12 billion annually. CHF, AMI and PNA patients had the most frequent and the most expensive readmissions (Clinical Advisory Board, 2010). In October 2012, CMS added additional quality penalties by implementing the Medicare 30 day avoidable readmission penalties for AMI, CHF and PNA. Readmission rates are compared using an observed versus expected formula. Hospitals with higher readmission rates than expected are penalized financially with the maximum penalty initially capped at 1% of hospital Medicare revenues for the year. Both the number of readmission diagnoses and the percentage of penalty are expected to increase over time.

CMS has a third penalty program for preventable complications or hospital acquired conditions (HACs). There are eleven HACs that qualify for penalty beginning in 2013 (see Appendix A) including stage III or IV pressure ulcers, falls with injury and catheter associated blood stream infections. Tracking of these conditions began in 2009 and public reporting began in 2012. Hospitals performing in the lowest quartile are subject to a 1% penalty and additional reduction of payments from CMS. This reduction in payments can represent millions of dollars per year for a hospital. In addition, patients who experience these conditions will actually cost the hospital more to treat. The additional costs can range from a few hundred to thousands of dollars per patient (Nursing Executive Center, 2009) and are not covered by CMS or most third-party payors.

The cost of poor quality is evident. The impact on the individual patient and family can be devastating. The lack of progress in reducing hospital acquired conditions will lead to significant financial penalties for many hospitals. Third party payers tend to follow CMS regarding standards and payment strategies. Even hospitals with more commercial and less Medicare patients cannot escape the impact of poor quality. Major insurers are already

renegotiating their contracts to include quality metrics and reduced reimbursement for failing to achieve metrics established by CMS.

The reduction in Medicare and Medicaid reimbursement and decline in commercial managed care rates are not the only financial pressures for hospitals. The impact of the recession lagged for healthcare and did not start affecting hospitals until 2009. Since then, there has been a steady increase in the number of uninsured or underinsured patients nationwide. All of these elements contribute to a decline in gross revenue for hospitals and health systems. At the same time revenue is declining, expenses are increasing. The costs of medical supplies and equipment continue to escalate at 2-5% per year and the cost of labor, while relatively flat at 2% increase per year in the past few years, is beginning to escalate as well. As healthcare workers over fifty begin to retire, labor shortages will contribute to escalate costs. The impact of all these forces is a decline in net revenue at a time when resources are required to improve quality and care coordination.

A Project to Address Quality and Cost

The purpose of this project was to assess the impact of a masters-prepared nurse, working as a clinical nurse leader or nurse navigator (CNL/navigator), on patient quality and satisfaction on medical surgical units that have experienced an increase in nurse/patient ratios. The role of a CNL/navigator is in support of direct care nurses and provides care coordination for complex patients while supplementing the staff RN care with expert skills and education. In addition, the hope is that this role can mitigate the impact of a higher nurse/patient ratio.

The project was implemented on medical surgical units in a multi-hospital system in the southeast. The system has over 1,100 beds and 9,000 staff, 2,800 of whom are registered nurses. Nursing practice is governed by hospital and system-level shared governance councils. Hospital

nurse executives collaborate to lead the clinical care through an executive council chaired by the system chief nursing officer.

Two questions contributed to the development of this project:

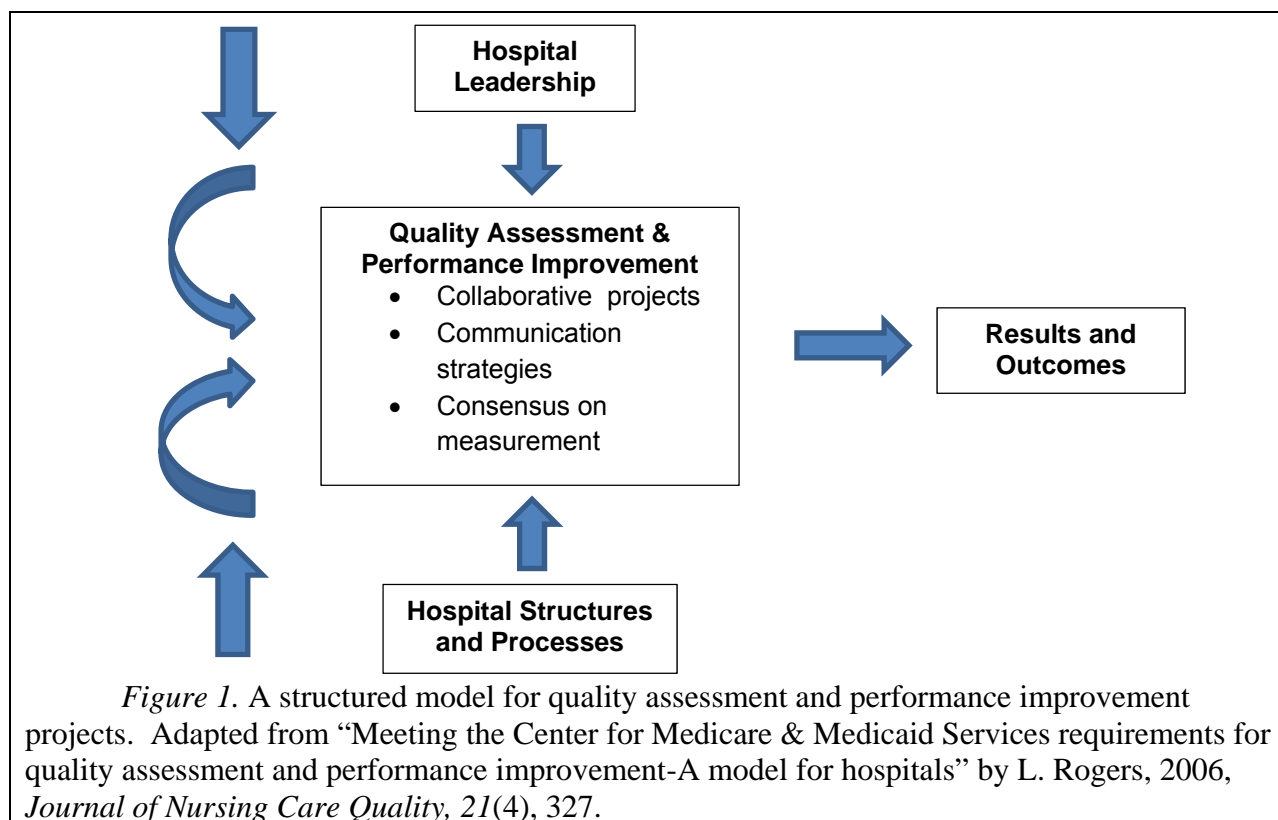
- What strategies should be used to prepare a health system to move from a “volume” approach, paid for how many procedures are done, to a “value” approach, paid for the outcome of the work done; and,
- How can quality outcomes be improved while responding to the decline in revenue industry wide?

The continuum of care impact team. Chartered in 2010, the continuum of care impact team (CCIT) was an interdisciplinary team charged with answering the first question. The team was commissioned by the system chief executive officer and led by the system chief nursing officer. Team members included physician hospitalists and primary care physicians, social services, administrators, information technology staff, home health leadership, advanced practice nurses, quality analysts, the chief quality officer, operational performance improvement staff, pharmacists, nurse leaders, finance and planning analysts.

The CCIT spent several months researching healthcare reform, the CMS quality proposals and best practices regarding care coordination and readmission prevention. Subgroups took specific topics such as (a) prevention of readmissions; (b) the use of clinical information technology to improve communication and hand-offs from the hospital to the community care providers; (c) the use of evidence-based tools for assessing high risk, complicated patients; and (d) the use of teach back as a method to educate patients and families. Over a three-year period the team tested many ideas and accomplished iterative goals that helped identify strategies to

move from a volume to value world. Pertinent to this project was the identification of the impact of a masters-prepared nurse on coordinating care and reducing readmissions.

The model of care redesign - a performance improvement project. CMS and the JC have promulgated rules and standards that require hospitals to improve patient safety and quality through performance and quality improvement programs. This implies the ability to define a process, assess how well it is working and to determine what could be done to improve an outcome through improving the process. Rogers (2006) addressed the complexity of healthcare and the need to follow an evidence-based model to improve and sustain performance. “From senior executives to front-line staff, all healthcare professionals must want to improve quality and safety, have the resources to collect and analyze data, and continuously evaluate their efforts” (Rogers, 2006, p. 326). Rogers offers an integrated model that formed the structure for this project.



The model illustrates that quality outcomes derive from an interaction with hospital leadership and interdisciplinary staff to come to consensus on elements to be improved and what improvement will look like. Rogers (2006) gives criteria to help identify how to prioritize projects in the complex healthcare environment including the

- importance to internal and external customers;
- link to organizational mission and strategies;
- project involves systems thinking and addresses activity at all levels of system-small details and big picture;
- project is scientifically sound or evidence based;
- project is related to high risk, high volume or high cost issues (is it worth the effort to improve?); and
- team has the knowledge and skill to change or improve the issue (Rogers, 2006, p. 327).

The purpose of this project, to assess the impact of a masters-prepared nurse working as a CNL/navigator, on patient quality and satisfaction on medical surgical units that have experienced an increase in nurse/patient ratios, met Rogers' criteria for a priority project. The risks and costs of poor quality outcomes are evident. This project sought to improve quality through using evidence-based practice strategies to change the structure of nursing and patient care on a unit and was an integrated performance improvement project. Rogers also offers a model to evaluate organizational compliance with the performance improvement project which formed the framework for evaluation of the success of this project.

Chartered in 2011, the care redesign team's (CRT) vision was set by the system nurse executives. The team was asked to review the literature looking for evidence-based best practices on staffing and care delivery and recommend potential care redesigns that would improve quality

and reduce costs. Team members included the nurse executive champion, other nurse leaders, physicians, social services and nursing staff.

CRT members reviewed the literature to understand existing models of care, and reviewed the following models of care: (a) the 12-bed hospital from Baptist Hospital of Miami, Florida; (b) the Primary Care Team from Seton Hospitals in Austin, Texas; (c) the Collaborative Patient Model from High Point, North Carolina; (d) the Transitional Care model from The University of Pennsylvania, Philadelphia, Pennsylvania; and (e) the Hospital at Home concept from The Johns Hopkins University, Baltimore, Maryland. Kimball, Joynt, Cherner & O'Neil (2007) identified common elements from the models that the team wanted to adopt including:

- involving caregivers in the design of the model;
- elevating the role of the registered nurse to a primary care manager;
- focusing on patients and families;
- focusing on the transitions of care and handoffs;
- leveraging technology wherever possible; and
- focusing on producing measurable, sustainable results (p396-397).

The CRT also looked at units within the five hospital system where advanced practice or master's prepared nurses were already practicing. Two of the hospitals utilized master's prepared nurses either in CNL roles or in a blended role of educator/clinical specialist. Nurses in these roles were invited to provide their perspective to the team on care redesign as it related to the work they performed

The team worked with finance and performance improvement analysts to compare units across the system looking at RN demographic characteristics, financial outcomes and patient acuity and outcomes. High performing units, as defined by positive patient outcomes and high

RN scores for “would recommend this hospital as a good place to work” were identified. RN characteristics were then correlated with the positive outcomes to determine potential drivers of success. Three characteristics emerged as being highly correlated to positive unit outcomes: (a) high performing RNs as measured by performance evaluations, (b) percentage of BSN RNs, and (c) RN direct hours of care.

Forty five nurses including shared governance chairs, unit staff, leaders, community academic leaders and evidence-based practice mentors participated in a retreat in August 2011. Participants were asked to read the Kimball, Joynt, Cherner, and O’Neil (2007) article on innovative care models. In addition, Nash’s (2010) book on the ultimately safe hospital was given to the team to provide context for the discussions. A vision authored by the nurse executive team (see Appendix B) was given to the group to set the stage for the developmental work.

The pilot experience. The outcome of the retreat was the creation of a highly motivated interdisciplinary team ready to move the model of care work forward. This team was instructed to build upon the successes seen in the CCIT with readmission reductions and incorporate best practices from the literature in their work. The team utilized the hospital unit-based analysis of drivers of success to develop a strategy for care delivery that was intended to improve the coordination and quality of care and remain budget neutral.

The result was the adoption of the CNL (AACN, 2007, p. 3) or clinical nurse navigator role. A CNL is a nationally certified, master’s prepared generalist. The nurse navigator is a title typically used in oncology to describe a nurse who assists patients throughout their continuum of care from diagnosis through rehabilitation. The CRT felt that CNL preparation was preferable for this role but that a nurse with experience in coordinating care and a master’s degree other

than a CNL could also be successful. The working definition of the role for this project was a unit-based master's prepared nurse who works in an interdisciplinary team environment to coordinate the care of complex patients assuring excellent clinical and experience outcomes throughout the continuum of care. A performance plan was prepared for the role termed the Clinical Nurse Leader/ Navigator (see Appendix C).

The CRT designed a three to six month pilot using the CNL/navigator as a care coordinator for complex patients assessed as high risk for readmission. The pilot navigators were an experienced advanced practice nurse and a nurse manager. Pilot units were two self-selected medical-surgical units. The navigators were paired with social workers to assist with the discharge process and address continuity of care issues. Staff and physicians were educated regarding the roles of the CNL/navigator and social worker dyad, and the two new navigators began to execute the pilot under the guidance of the nurse executive and team leaders. Navigators met with the design team at least once a month and shared their perspective on the barriers to implementation. The team developed a dashboard encompassing the quality and satisfaction outcomes, readmissions rates and length of stay data. Quality and satisfaction data typically lags 4-6 weeks and readmission data lags 2-3 months so dashboards were not populated in real time for the pilot. However, it was clear to the navigators, staff on the pilot units and the design team that the navigators were making an impact on the patient and staff experience. Nurses felt like they had more time to complete their work and appreciated the help with assessments, teaching and discharge planning.

The pilot design began in the fall of 2011 and the pilot units came up sequentially from January 2012 through March 2012. The intent was to add the master's prepared nurse as budget neutral additions (utilizing a vacant position or converting an existing role to the

CNL/navigator). By March 2012, financial projections began to demonstrate a sustained, significant downward trend in revenue secondary to Medicare and Medicaid reductions, reduction in patients covered by commercial companies and increases in self-pay and charity care. The CRT was asked to revisit the proposed model because budget neutral would not be sufficient but a reduction in labor dollars would be required for the next fiscal year. The team was challenged to determine if the CNL/navigator could make a positive impact with a slightly increased nurse to patient ratio.

The team focused on medical surgical units across the system because they represent a greater number of patients and nurses than other units and the patients often have diagnoses requiring significant care coordination. This type of coordination can be difficult for staff nurses but the CRT believed the CNL/navigator could make a positive impact for the nurses and the patients. In the development of the fiscal year (FY) budget, ratios on medical surgical units were increased 0.5 to 1.0 patients/nurse with the maximum budgeted ratio being one RN to six patients for adults. The team believed that a high functioning CNL/navigator would be able to add value and mitigate the impact of the reduction in budgeted staffing. The focus of the CNL/navigator, as noted in the performance plan, was the coordination of care to improve quality and decrease readmissions.

The launch of the new model of care. The pilot CNL/navigators and their social work partners continued to function while the rest of the organization prepared for the changes in the staffing ratios and in the adoption of master's prepared nurses as CNL/navigators. This combination was referred to as the new model of care delivery [model]. There was direct communication with leaders and staff via grand rounds where the chief nursing officer explained the rationale for the model itself, the financial realities and the role the CNL/navigator/social

worker team would have in supporting the staff. In person communication was supplemented with talking points (see Appendix D). CNL/navigator candidates were interviewed and selected. Staffing changes were made slowly over four-six months preparing for the launch of the new model October 1 – December 31, 2012. The anticipated budget reduction from altering the nurse/patient ratio was approximately \$4 million annually.

The Problem

The demand for high quality, low cost healthcare is being driven by the federal government, private payers, businesses and patients themselves who increasingly feel they cannot afford insurance or health care. Health care providers, especially hospitals, find it challenging to meet quality and service expectations while reducing costs. Addressing the problem requires innovative solutions that combine evidence-based practices with the reality faced in acute care delivery today. The use of masters-prepared nurses to coordinate care has been implemented in a number of settings over the years. The impact of adding this resource while reducing overall staffing is not known. The purpose of this project was to assess the impact of the role of a masters-prepared nurse, working in the capacity of a CNL/navigator on patient quality and satisfaction outcomes on medical surgical units that have experienced an increase in nurse/patient ratios.

Project Description

The model was implemented in 19 medical surgical units across five hospitals in the southeast with changes introduced over a period of four to six months. Education of staff, support of the model and evaluation of outcomes is on-going. Five units from one hospital were followed for this project. There are many variables that can impact quality outcomes including ancillary staffing, scope of nurse leader responsibilities, homogeneity of patient diagnoses,

philosophy of nurse leaders regarding staffing and staff engagement, the environment established by the nurse executive, etc. Focusing the project in one hospital helped mitigate those variables. Staffs were educated regarding the modified model of care. CNL/navigators, their social service partners and nurse leaders were given opportunities to understand their roles and responsibilities, review the success criteria for the model, plan for implementation and discuss barriers to success. An experienced nurse navigator served as a role model/coach for the teams throughout the system and throughout the project. The following standardized measures of quality and satisfaction were used to evaluate success:

Service HCAHPS questions	<ul style="list-style-type: none"> • How often did nurses explain things in a way you could understand? • How often did the hospital staff do everything they could to help you with your pain? • Did doctors, nurses and staff talk to you about whether you would have the help you needed when you left the hospital?
Patient Safety/Never Events	<ul style="list-style-type: none"> • Catheter associated blood stream infections • Hospital acquired pressure ulcers stage III or IV
Quality/Core Measures Value Based Purchasing (Measured for entire hospital, not just one unit)	<ul style="list-style-type: none"> • Heart failure discharge instructions complete • Urinary catheter removal on post op day 1 or 2 with day of surgery being counted as day 0
30 Day Readmissions (Measured for entire hospital, not just one unit)	<ul style="list-style-type: none"> • Congestive heart failure • Acute myocardial infarction • Pneumonia

This performance improvement project used a retrospective, one-group pre-post design.

The standardized measures of quality and satisfaction (see Appendix E) were collected during

the first six months (Time B) of the implementation of a modified care model, and were compared to the same measures in the same time frame of the prior year (Time A).

Research Questions

The following questions guided the literature review:

- how does implementing the role of a CNL/navigator on a medical surgical unit affect quality outcomes and patient satisfaction, and
- can having a CNL/navigator on a patient care team mitigate the impact of increases in the nurse/patient ratios on quality and satisfaction outcomes?

Definition of Terms

Case Mix Index (CMI). Case Mix Index (CMI) is an indirect measure of inpatient acuity. It is a CMS weighted financial formula that takes into account patient diagnoses (based on their assigned Diagnostic Related Group (DRG), the number of patients in the DRG category and the regional charges for inpatient services. CMI is expressed as a whole number and a fraction written as a decimal i.e., 1.24. The higher the number, the more complex a patient is considered and the greater the number of services the patient used. Therefore, it is a proxy for acuity level for inpatients (Spryszak, 2010).

Clinical Nurse Leader (CNL). A CNL is a master's prepared nurse who has graduated from a specific CNL graduate program and has passed the national board for CNLs (American Association of Colleges of Nursing, 2007, p. 10).

Diagnostic Related Group (DRG). This is part of the CMS payment system. Patients are assigned at discharge to diagnostic related groups with other patients with similar diagnoses that are expected to use similar amounts of hospital resources. Payments are calculated based upon the weighted DRGs (Medicare Learning Network, 2009).

Full time equivalent (FTE). A measure used to indicate the number of hours one (or more if part-time) employees would work to be considered full time. An FTE count is the number of hours worked divided by 40.

Gross Domestic Product (GDP). This is an economic term that reflects all of a country's economic output, goods and services, in a given time.

Hospital acquired conditions (HAC). The Centers for Medicare and Medicaid Services (CMS) defines these as conditions that are (a) high cost or high volume or both, (b) result in the assignment of a case to a diagnostic related group (DRG) that has a higher payment when present as a secondary diagnosis, and (c) could reasonably have been prevented through the application of evidence-based guidelines. The list of official HACs is evidence-based, was developed over time and is updated as evidence changes (Hospital-acquired conditions, 2012.)

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). The HCAHPS survey is the first national, standardized, publicly reported survey of patients' perspectives of hospital care. The standardized questions and methodology for collecting and analyzing the answers allow valid comparisons to be made across hospitals and allow public reporting of data. Medicare reimbursement is partially determined by the HCAHPS hospital results. (HCAHPS: patients' perspectives of care survey, 2013.).

Hospital Readmissions Reduction Program (HRRP). The CMS program under the Affordable Care Act that reduces payments up to 1% for hospitals who have excessive readmissions of acute myocardial infarction (AMI), congestive heart failure (CHF) and pneumonia (PNA). Penalties are calculated on a formula that compares hospitals and looks at variations from expected readmissions based on patient diagnoses and acuity.

Nurse navigator. This is a general term used to refer to a role nurses fulfill with patients to help coordinate their care, usually across the continuum, and help them navigate their way. This does not require a master's degree but for purposes of this project the nurse navigator will have a master's degree in nursing or a related field (see Appendix C).

Nurse/patient ratio. The measurement of how many patients one nurse has assigned on any given shift.

Nursing hours per patient day (NHPPD). The National Quality Forum defines this as the measure of the supply of nursing relative to the patient workload. Mathematically it is the total number of productive hours worked by nursing staff with direct patient care responsibilities on acute care units per patient day.

RNHPPD. NPPD can be further refined as RN hours per patient day, looking at just the hours RNs spend on direct care of patients per day. (National Database of Nursing Quality Indicators, 2010).

Nursing-sensitive indicators. The American Nurses Association (ANA) defines these as a reflection of the structure, process and outcomes of nursing care. The number, skill level and education level of nurses reflect the structure of nursing care. The work that nurses do such as assessments and treatments, and nurses' satisfaction with their roles reflects the process of nursing care. If a patient outcome can improve because of having more nurses or nurses who are more competent it is said to be a nursing-sensitive indicator. Hospital acquired pressure ulcers are an example. (Nurse-Sensitive Indicators, 2013).

Performance Improvement. The systematic process of detecting and analyzing performance problems, designing and developing interventions to address the problems,

implementing the interventions, evaluating the results, and sustaining improvement (The Joint Commission, 2013, p. GL-28).

Chapter Two: Review of Literature

The project involved the modification of the model of care on medical surgical units through a change in nurse/patient ratios and the addition of master's prepared nurses to coordinate care and supplement the care of staff RNs. This chapter examines the evidence that supports nurse staffing decisions and the potential contributions that can be made to care coordination by master's prepared nurses

The Search

The question. The literature review was designed to help answer the question how does implementing the role of a CNL/navigator on a medical surgical unit affect quality outcomes and patient satisfaction? The PICO elements were: (a) population-patients on medical surgical units; (b) intervention-addition of CNL/navigator role; (c) comparison-patient outcomes before and after role implementation; (d) outcome-patient quality and satisfaction results; and (e) time-a six month time period pre and post implementation.

While the impact of the addition of the CNL/navigator was the performance improvement strategy, the fact that nurse/patient ratios were simultaneously increased confounds the evaluation of the impact on quality outcomes. These different but related topics led to a bifurcated review of the literature.

Search terms and strategies. Searched terms included: clinical nurse leader, nurse navigator, patient outcomes, nurse-sensitive quality outcomes, patient satisfaction, care coordination and nurse staffing. Terms were combined to maximize finding articles that would address the questions. For instance, CNL was combined with patient outcomes or nurse staffing was combined with quality outcomes. The goal was to find the highest levels of evidence that spoke to the impact of the CNL/navigator on patient outcomes and to the impact of nurse staffing

in general on patient outcomes. In addition, literature that represented expert opinions concerning healthcare reform and coordination of care was reviewed for background.

Databases used included CINAHL, Cochrane Library, Medline, Science Direct, OVID, Nursing and Allied Health Collection, the Joint Commission and the Institute of Medicine websites. The search years were 2000-2013, and included studies published in English. Twenty-five articles and task force reports were reviewed. Within the topic of care coordination and the role of the CNL/navigator, one level one systematic review was located, one level two RCT, two level five integrated literature reviews, two level six reviews using case studies, and one level seven expert opinion white paper were used. The impact of staffing on patient outcomes revealed two level one systematic reviews and one level five review of studies. The strength of the level one systematic review made further literature searches unnecessary (see Appendix F). The levels of evidence were appraised using Melnyk and Fineout-Overholt (2011).

The CNL/navigator and Care Coordination Literature Review

The role of clinical nurse leader was developed through the American Association of Colleges of Nursing (AACN) to help address the call for safer, more coordinated care for patients. This role has often been described as a master's prepared generalist but in reality the specialty of the CNL is assessment and care coordination. By 2003, the AACN Task Force on Education and Regulation II (TFERII) had endorsed and defined the CNL role and defined the competencies and requirements for education and certification (AACN, 2007).

There is significant emphasis in CNL education on accountability for the outcome of care for any given population. There is an emphasis on using evidence in developing the CNL practice and in practicing in collaboration with other disciplines and nurses to improve the outcomes of the patients. The CNL role is designed and prepared specifically to improve care

coordination. Numerous studies have attempted to demonstrate the impact of the CNL role since the inception in the early 2000's.

Nosbusch, Weiss & Bobay (2010) conducted an integrated review of the literature on the challenges confronting acute care staff nurses in discharge planning. They reviewed 38 studies from 1990-2009 looking for the state of the science in discharge planning for direct care nurses. They identified seven barriers that direct care staff nurses faced in trying to discharge patients:

- Registered Nurse (RN) communication difficulties with each other, the patients and families;
- the lack of standardized processes and care maps that would enable RNs to know what to do relative to discharging patients;
- the lack of time when patients turnover quickly on the units or patient assignments are heavy;
- the role confusion among disciplines as to whose job it is to discharge;
- a lack of care continuity of assignments so that RN often doesn't know much about the patient;
- lack of knowledge of community resources post discharge; and
- the fact that more emphasis is placed on the RN initial assessment and medication administration than on discharge planning (p. 770).

One of the limitations to the primary studies reviewed is that various methods were used in study design including qualitative, closed record review, etc. The inconsistency of design and methodology diminishes the power of the studies. While not looking specifically at the role of a CNL/navigator, this review did identify common barriers that direct care nurses face in coordinating care and reinforced the possibility that the American Association of Colleges of

Nursing (AACN) CNL role could help address those barriers through educational preparation, superior communication and coordination skills and a role focused on care coordination and quality outcomes.

Forster et al. (2005) also looked at how to improve care coordination during and post hospitalization. In a randomized controlled trial they assigned 620 patients in two Canadian hospitals to either a clinical nurse specialist (CNS) (n=307), who would focus on care coordination, or the usual care by the direct care nurses (n=313). Patients were followed for three months looking at inpatient and post discharge outcomes. Inpatient outcome measures included mortality, community discharge status and adverse events. Post-discharge outcome measures included mortality, readmission and patient satisfaction using a standardized telephone interview. The trial demonstrated no difference in any of the outcomes with the exception of patient satisfaction which was higher in the CNS group ($p = .05$). There were several issues identified with the study. Forty percent of the patients were lost to follow up, the subjects were not randomly assigned to groups, and there were differences in patient perception of quality versus actual measures of quality, which may have been impacted by the patient knowing the group assignment. Nurses educated as clinical nurse specialists are typically not exposed to significant care management or transitional care content. While the nurses' roles in this study were care coordination, their preparation would not be equal to that of the CNL which could also impact the results. This study was structured as a level two randomized control trial but there are difficulties in conducting true RCTs with the complexities of care management. Randomizing a complex process of the nature of care management can impact the validity of the outcome of a randomized clinical trial.

The Veteran's Health Administration (VHA) was a significant early adopter of the CNL role because their clients are complex, long term and require highly coordinated inpatient and outpatient services. The VHA formed relationships with six academic institutions to provide practice settings for the new role of CNL and initially 50 VHA centers were involved. This was a nationally led effort that was executed at specific VA hospital and clinic sites. The CNL was expected to lead the nursing care of his/her patients and improve both quality and satisfaction. In addition, CNLs were expected to model innovative and fiscally responsible care of patients for their colleagues. Ott et al. (2009) in an integrative review of VHA literature examined the impact in various centers of the implementation of the CNL role. The addition of the CNL was to be budget neutral. The specifics of achieving budget neutral were not discussed but the expectation was of interest to the execution of this project.

Key to the success of the CNL role in the VHA system was the preparation done prior to introducing the role. Because this was a new concept, there was intentional discussion about the purpose of the role and how it interacted with other disciplines before the CNLs began on their units. The VA development team identified a score card for success of the role with specific domains and outcomes articulated as follows

- the financial domain with outcomes of nursing hours per patient day (NHPPD), canceled procedures and sitter hours;
 - the quality domain with outcomes of hospital acquired pressure ulcers (HAPU), falls, discharge teaching, rates of ventilator associated pneumonia (VAP) and restorative care factors;
 - the satisfaction domain for both staff and patients as measured on standardized surveys;
- and

- the innovation domain of evidence-based practice as documented in CNL personal journals (Ott et al., 2009, p.365).

Centers were allowed to select the outcomes on which they would initially focus and measure from these domains.

After two years 14 centers had executed the role and adopted the outcomes sufficiently to participate in an evaluation using pre (3 months prior to the CNL implementation) and post (6 months after implementation) data comparisons. The final evaluation involved seven of the centers that met the criteria. Results were reported for each center individually because they did not all select the same variables to improve. The failure to execute to completion, in 43 of the original centers, illustrates an issue identified by other authors that makes comparative research for nursing staffing and care processes difficult. The wide variation of sites and outcome measures makes the end results less able to be generalized.

Within the financial domain, one site experienced a decrease in sitter hours without a decline in quality measures. They estimated this saved over \$10,000 a month (Ott et al., 2009, p. 368). NHPPD were collected in two of the hospitals. Prior to CNL role implementation the average NHPPD was 6.09, afterwards it was 6.74 ($p = .0006$). The CNLs in these facilities did not work as direct care staff and were not counted in the RNHPPD. However, the authors felt the CNL role was able to help direct care staff work more efficiently and effectively and literally have more hours to give to patient care as a result (Ott et al., 2009, p. 366). One center chose to measure changes in procedure cancellation and demonstrated significant decreases in cancellations ($p < .004$) and a projected savings of \$461,775 for the year.

In the quality domain, five of the facilities focused on reduction of HAPUs but only one site had pre and post data. HAPUs prevalence reduced from 12.5% to 4.2% ($p = .0025$). Two

facilities measured incidence of falls and found a non-significant reduction in spite of some very innovative programs the CNL put in place to educate staff and patients regarding falls. In one facility the documentation of discharge teaching, which is believed to help reduce readmissions, rose from 13% to 90%. One facility experienced a decrease in ventilator associated pneumonia from an incidence of 21.7% to 8.7% post CNL implementation.

Data was less clear in the satisfaction domain due to lack of unit specific measures. The study was limited by the design (a convenience study over a wide time range) and by the lack of consistency in outcome parameters. There is little discussion about the processes used to implement the changes or if there was an attempt to standardize processes across sites. The value of this review lies in the fact that each individual site was able to demonstrate some benefit of the CNL role as described by the AACN white paper but it would have been much more helpful to understand how that benefit was achieved.

Stanley et al. (2008) had similar issues when conducting a review of case studies from three sites that implemented the CNL role. The sites were geographically dispersed and the roles the CNLs were assigned varied. Each site reported improvement in various quality measures such as core measures, HAPU and length of stay but there was not enough data to determine statistical significance.

Case (2011) conducted an integrated review of studies looking at the role of the navigator and case manager in the oncology setting. Eighteen primary studies from the United States, Canada and Sweden were reviewed for the impact of the navigator role on nurse sensitive outcomes, on the appropriateness and timeliness of treatment, on the patient's mood and satisfaction and on continuity of care and cost of care. The results of the studies were not consistent. Rationale for implementing the navigator role varied by locations but included giving

patients access to information and coordinating care especially for the uninsured. The patient diagnoses were primarily but not exclusively breast cancer. The impact of the diagnosis was thought to both mitigate some of the positive results and yet, enhance the results in certain subsets of patients (uninsured, African American). There were no differences seen in overall cost of care. Once again the variability of study designs, locations and care processes prevent generalization of results. They do, however, reinforce the idea that a nurse in the navigator role can make an impact for patients.

Naylor, Aiken, Kurtzman, Olds & Hirschman (2011) conducted a systematic review of studies involving transitional care interventions for adults with chronic conditions. This was in an effort to identify interventions that would help achieve the goals of healthcare reform including coordinated, lower cost healthcare. They defined transitional care as “a broad range of time-limited services designed to ensure health care continuity, avoid preventable poor outcomes among at-risk populations, and promote the safe and timely transfer of patients from one level of care to another or from one type of setting to another” (Naylor, et al., p. 747). This definition is aligned with the role and purpose of the CNL/navigator role. The authors reviewed 587 English articles and included 21 RCTs, 14 from single sites and 7 from multi-site trials. Participants received either emergency or inpatient care. Mean sample size was 377, mean age 64.7. The authors looked at hospital interventions and compared them to components of the Affordable Care Act provisions relative to care coordination. Of the interventions they studied, the ones that would apply to the impact of the CNL/navigator role include comprehensive discharge planning, education, geriatric assessments, and intensive primary care follow up requiring a connection being made pre discharge. Study participants were followed an average of 5.4 months. All but one of the studies reported positive findings in one or more categories of patient satisfaction with

care, reduced readmissions (nine studies demonstrated significant reduction in 30 day readmissions), and quality of life indicators. Results from two of the studies indicated the average savings to Medicare for patients in this program was \$3,000-5,000 per patient per year. While the studies did not look at all of the elements of healthcare reform, insights gained from the review included that emphasis on transitional care is beneficial to the patient and saves healthcare costs. The authors concluded the following: comprehensive discharge planning (a role shared by the CNL/navigator) was critical to the success of the studies; formal bodies such as the AHRQ or managed care organizations should incentivize proven transitional care interventions; and nurses receive advanced training in care coordination.

The literature specific to the CNL/navigator roles reinforces the potential effectiveness of the role. It does not give unequivocal evidence that the role will be effective in improving quality or reducing costs, but that it could be effective under the right circumstances and in the right setting. The complexities of studying care interventions and processes are illustrated through this review. The evidence often quoted varies greatly in level of rigor and in study design and execution. The results of a singular study or a group of disparate studies can be quoted as evidence without focused evaluation. The ability to extrapolate evidence from less rigorous studies is significantly diminished.

The Impact of Staffing on Patient Outcomes Literature Review

This project was made more complex by the requirement that the addition of the CNL/navigator role could not be budget neutral but would have to mitigate the impact of a reduction in labor dollars through an increase in nurse/patient ratios. In order to evaluate the feasibility of that caveat, a literature review to understand the impact of nurse staffing on patient

outcomes was completed. The state of research on the impact of nurse staffing fares no better than that examining care coordination.

Patterson (2011) conducted a double-blind peer-reviewed literature review looking at the impact of staffing on patient outcomes. Fifteen studies from the United States and the United Kingdom spanning 10 years were reviewed. Included in this review was Linda Aiken's seminal work on the impact of nurse/patient ratios on patient mortality. Rafferty replicated Aiken's study in the United Kingdom with similar results. While this often quoted work has led to national discussions about the impact of ratios on outcomes, it is limited in scope to post-surgical patients and the ratios examined were from 1:4 to 1:8. The studies suggested ideal staff of 1:4 but there was no evidence to support that independent of examining other factors such as patient acuity, nurse education and experience, the care processes on the units and the experience and roles of other care team members was considered as impacting patient mortality as well. The author also looked at Needleman's study on failure to rescue secondary to poor staffing but again found the data inconsistent and difficult to interpret. All of the studies reviewed were observational not interventional and used administrative databases to assess outcomes. These attributes make the generalization of the results less reliable than the adoption of the findings would indicate.

McHugh, Berez and Small (2013) looked at the impact of RN staff on the odds of receiving financial penalties through the CMS Hospital Readmissions Reduction Program. The CMS database from July 2008 through June 2011 was analyzed to evaluate hospitals' risks of receiving penalties for 30 day readmissions for AMI, CHF and PNA patients. The authors matched hospitals by size, patient demographics, for profit status, geographic location, etc. to attempt to reduce bias and have appropriate comparisons. The American Hospital Association Annual Survey of RN staffing was used and RNHPPD was the metric measured. The authors

assumed that RN staffing would make a difference based upon the literature review conducted. RN staffing was divided into five quintiles and then hospitals penalty risks were matched with RNHPPD. Low staffing was defined as 5.1 RNHPPD, high staffing as 8.0 RNHPPD. While acknowledging that data came from large administrative databases which are dependent upon coding and record keeping for accuracy, hospitals with higher staffing had 25% lower odds of being penalized for readmissions than hospitals with lower staffing (McHugh, Berez & Small, 2013, p. 1742). The study had many limitations including the fact that the amount of readmission penalty is not the same as the number of readmissions which might or might not be high. It also doesn't take into account any other variables that could also impact readmission including physician behavior, adoption of electronic medical records for appropriate documentation, discharge planning programs, etc. The authors suggested that the findings could not be determined to be causal but should be used by hospital administrations to evaluate the relative value of RN staffing in meeting the requirements of healthcare reform.

There were two systematic reviews of nurse staffing impact on patient outcomes that helped explain the challenges associated with this type of research and the pitfalls in making changes based on the studies. Butler et al. (2011) conducted a systematic review of over 6,000 studies that addressed staffing including randomized controlled trials (RCTs), controlled clinical trials, before and after studies and interrupted time series analyses. They used the Cochrane Effective Practice and Organisation of Care review criteria and found 486 potentially relevant studies and selected 15 that met the final criteria. Four of the studies looked at specific staffing models and 11 included adding support to existing models either through the addition of a nurse specialist or increasing the proportion of support staff. Patient outcome criteria included mortality measures, length of stay, readmission rates, return to the emergency department post

discharge and nurse-sensitive outcomes including infections, HAPUs, falls and medication errors. The purpose of the review was to explore the relationship between nurse staffing and patient outcomes since there seemed to be insufficient evidence to determine causal relationships.

The results were mixed. There was no evidence that the addition of a nurse specialist impacted mortality, returns to the emergency department or readmissions. There were mixed results in the nurse specialist role impacting length of stay but positive results in decreasing HAPUs. In two studies patient mortality decreased with the increase of support staff. The evidence suggested that increasing support staff could have a positive impact on other patient outcomes but there was not statistical significance to support the suggestion. Two of the studies looked at the cost of additional staff versus the financial impact of improved outcomes but yielded no significant results. In spite of the selection rigor used in study selection, the evidence was ranked moderate at best by the authors who indicated the risk of bias was high in many of the studies.

The most clarifying systematic review was that of Brennan, Daly & Jones (2013). The authors conducted a review of reviews on the state of evidence supporting the relationship between nurse staffing and patient outcomes to explore why there are no evidence-based staffing guidelines. In this study, 112 reviews were assessed of which eight systematic reviews and 21 literature reviews met inclusion criteria that involved reviews of studies looking at the impact of nurse staffing on patient outcomes in acute care settings. Primary research studies were excluded but primary studies within the selected reviews were analyzed to determine if they would have met the criteria for inclusion.

The authors found highly variable results regarding staffing impact on outcomes. Aiken's seminal work demonstrated a significant increase in patient mortality and failure to rescue with decreased staffing. Needleman's work demonstrated a decrease in surgical complications with increased staffing. However, Mark & Harless (2011) demonstrated diminishing returns in outcomes once staffing reaches a certain point. Donaldson et al. (2005) studied the impact of the mandated one RN to four patients' ratio in California and found no improvement in nurse-sensitive patient outcomes.

The authors cited several reasons why the research findings are so inconsistent in this field. There are no consistent ways to measure RN staffing. Nurse/patient ratios, RN hours per patient day or all hours of care per patient day are used to quantify staffing. While they are all proxies for staffing, they are not interchangeable and their use yields different results.

There are also variations in the definitions of significant patient outcomes. Even among well respected agencies who measure quality-the AHRQ, the National Quality Forum and the American Nurses Association-only two quality indicators overlap, blood stream infections and HAPUs. No one agency speaks for consistency in outcomes definition.

Data sources are another reason study outcomes vary. If data comes from individual clinical units, it tends to demonstrate a stronger association but have a weaker ability to be generalized because of the small numbers represented. Studies are often observational because it is very challenging to randomize care to different units or different models of care. Observational studies are convenient and less expensive but the tradeoff is data reliability and validity. In large scale studies like Aiken's, administrative databases are often used to determine outcomes. These databases are subject to coding errors and allow minimal adjustment for any confounding variables that might be present. There is also difficulty in analyzing data through more rigorous

techniques like meta-analysis because meta-analysis depends upon the relationship between variables to be linear. The variables involved in the process of care are often non-linear and are highly dependent upon one another and react in non-linear ways. It is also often not possible to tell when a relationship between variables is causal.

Summary

Brennan, Daly and Jones (2013) summary of their review is that “inconsistencies across primary studies and inconclusive results inhibit translation of findings into clinically meaningful recommendations which has cause efforts to establish evidence-based staffing guidelines to stall in recent years” (p. 786). Their recommendations include looking at this subject through a new research paradigm, a theoretical framework known as Integrated Framework for a Systems Approach to Nurse Staffing Research. Further replication of primary studies or analysis of primary studies where the same design flaws exist was discouraged. The authors recommend a systematic approach that takes into account the complexity of care delivery, the various factors that impact performance in addition to numbers of staff caring for patients and the organizational characteristics which contribute to successful outcomes.

The impact of this literature review on the current project was that it substantiated the lack of evidence that demonstrates it is impossible to reduce direct care staff, supplement with a CNL/navigator and improve patient outcomes. While the evidence tended to favor the link between increased staffing and improved patient outcomes, it was by no means clear or consistent. The impact of the master’s prepared nurse on patient outcomes was equally inconsistent. Factors influencing the patient outcomes were highly variable in the literature and were considered when implementing the project.

Chapter Three: Methods

This chapter includes a description of the design, sample, and data collection tool used for this performance improvement project involving the modification of the model of care on medical surgical units through a change in budgeted nurse/patient ratios and the addition of master's prepared nurses to coordinate care and supplement the staff RNs. The goal of the project was to determine the impact of the clinical nurse leader CNL/navigator on standardized measures of patient quality and satisfaction outcomes.

Study Design

This performance improvement project used a retrospective, one-group pre-post design. Data previously collected and archived for the purposes of accreditation was analyzed. The project used standardized measures of quality and satisfaction and compared the results before and after the implementation of the CNL/navigator to determine the impact on quality and satisfaction. Key measures of success (see Appendix E) were collected during the first six months (Time B) of the implementation of a modified care model, and were compared to the same measures in the same time frame of the prior year (Time A).

Sample

The previously collected archival data sample used in this project came from archived standardized quality measures in the realm of service (patient satisfaction), patient safety and quality outcomes. All of the archived data used in the project is routinely collected for other purposes including performance improvement activities and reporting to the Joint Commission (JC) as well as Centers for Medicare and Medicaid Services (CMS). All of the data is routinely collected by the sources indicated on the data collection tool (see Appendix E).

The sample data came from the five medical surgical progressive care units, designated Unit A, Unit B, Unit C, Unit D, and Unit E. No patient records or individually identifiable protected health information, according to HIPPA, was accessed for this study.

Setting

The setting for this project is a 225 bed community hospital in the southeastern United States. The hospital has five 24-bed medical-surgical progressive care units that were used as the comparator units.

Methods

A data collection sheet with the key measures of success was developed jointly by the quality, safety and clinical stakeholders and used as the metric tool for this project (see Appendix E). The measures used to assess the effectiveness of the CNL/navigator role included:

Definition*	Key Measures of Success
Service HCAHPS questions	<ul style="list-style-type: none"> • How often did nurses explain things in a way you could understand? • How often did the hospital staff do everything they could to help you with your pain? • Did doctors, nurses and staff talk to you about whether you would have the help you needed when you left the hospital?
Patient Safety/ Never Events	<ul style="list-style-type: none"> • Catheter associated blood stream infections • Hospital acquired pressure ulcers stage III or IV
Quality/Core Measures Value Based Purchasing (Measured for entire hospital, not just one unit)	<ul style="list-style-type: none"> • Heart failure discharge instructions complete • Urinary catheter removal on post op day 1 or 2 with day of surgery being counted as day 0
30 Day Readmissions (Measured for entire hospital, not just one unit)	<ul style="list-style-type: none"> • Congestive heart failure • Acute myocardial infarction • Pneumonia

*Definitions reflect standardized industry definitions.

Data Collection

All data was accessed by the principal investigator (PI) through the performance improvement system database. Data was de-identified and documented on the study data collection sheet. The retrospective data from five 24 bed medical surgical progressive units was collected monthly or quarterly as noted on the data collection sheet.

1. Service data: was collected by a third party vendor and populated in the hospital system performance improvement computerized secure database.
2. Patient safety data: catheter-associated blood stream infections numbers were collected by infection prevention staff and reported in the aggregate through the performance improvement division. Hospital acquired pressure ulcers were reported by staff to risk management who then reported to the performance improvement division.
3. Core measures: heart failure discharge instructions and urinary catheter removal were abstracted from individual charts and reported in aggregate through the performance improvement division.
4. Readmission data: for congestive heart failure, acute myocardial infarction, and pneumonia were abstracted from individual charts and reported in aggregate through the performance improvement division.
5. All data collection sheets remained at the hospital as a protected work product under the Patient Safety Organization in compliance with Florida Constitutional Amendment Seven.

6. Under federal law the Centers for Medicare and Medicaid Services (CMS) has access to the performance improvement data collected for this performance improvement project.
7. No individually identifiable protected health information (PHI) according to HIPPA was collected.
8. There were two six-month data collection periods: A and B. The collection periods were separated by six months.

Income and Expenses

There was no income associated with this performance improvement project. The data was collected through the usual and customary business processes as required by the federal government.

Protection of Human Subjects

No individually identifiable protected health information (PHI) according to HIPPA was collected during the course of this performance improvement project. Permission to conduct this performance improvement project was obtained from the investigator's project committee, the Institutional Review Board (IRB) at the University of North Florida, and the hospital system.

Risks and Benefits

The institutional risk associated with this study was no more than minimal. This study does not involve human subjects. The benefits are potential administrative benefits related to the impact of additional resources on the comparator units included in the performance improvement project. The outcomes of this performance improvement project pose no employment risk to the individual clinical nurse leader/navigator involved in the project.

Confidentiality

Computer-based data files, containing the archived aggregated metric information (service, patient safety, quality core measures, and readmission rates), were only made available to personnel involved in the study through the use of access privileges, passwords, and encryption. The data was de-identified and not linked to any identifiable information from medical records, and was used only in aggregate. Data was entered into an electronic spreadsheet by the performance improvement analyst and sent to the principal investigator's work computer, which is protected by a password.

Data Analysis Plan

All raw data was entered into the computer and checked for errors. Data was analyzed for data collection A and B. Results for data collection A and B were compared.

Summary

This chapter described the methodology for this project, the permissions that were obtained in order to conduct this process improvement project, and the data analysis plan.

Chapter Four: Results

This performance improvement project involved the modification of the model of care on medical surgical units through a change in nurse/patient ratios and the addition of master's prepared nurses to coordinate care and supplement the care of staff RNs. The questions addressed by this project were:

- How does implementing the role of a CNL/navigator on a medical surgical unit affect quality outcomes and patient satisfaction, and
- Can having a CNL/navigator on a patient care team mitigate the impact of increases in the nurse/patient ratios on quality and satisfaction outcomes?

After literature review and discussion of best practices, key measures of success (see Appendix E) were identified by the clinical stakeholders and included measures of patient satisfaction, nursing-sensitive patient safety outcomes, quality core measures and readmission rates. This chapter describes the outcomes of those key measures.

Five medical surgical units in a community hospital were used for this performance improvement project, Unit A – Unit E. Previously collected archival data was used for the key measures six months prior to the implementation of the revised model of care, which represents the baseline (Time A) and the first six months of the implementation of the model (Time B). Specific data results are seen in Appendices G-I.

Results

Service Outcomes

Service or patient experience outcomes were measured using three questions from the HCAHPS questionnaire. These questions were chosen because they measure the patient's level of satisfaction with communication with the staff and with pain management. These elements

could be impacted by fewer nurses or by the addition of the CNL/navigator or both. Answers are represented as a percentage of respondents who answered “always”. Scores are weighted averages based on the number of respondents for each month’s survey. Two of the three satisfaction metrics declined, with an improvement in the question about pain. Unit D improved in two of the three measures; however, a notable benefit was not seen on the other units.

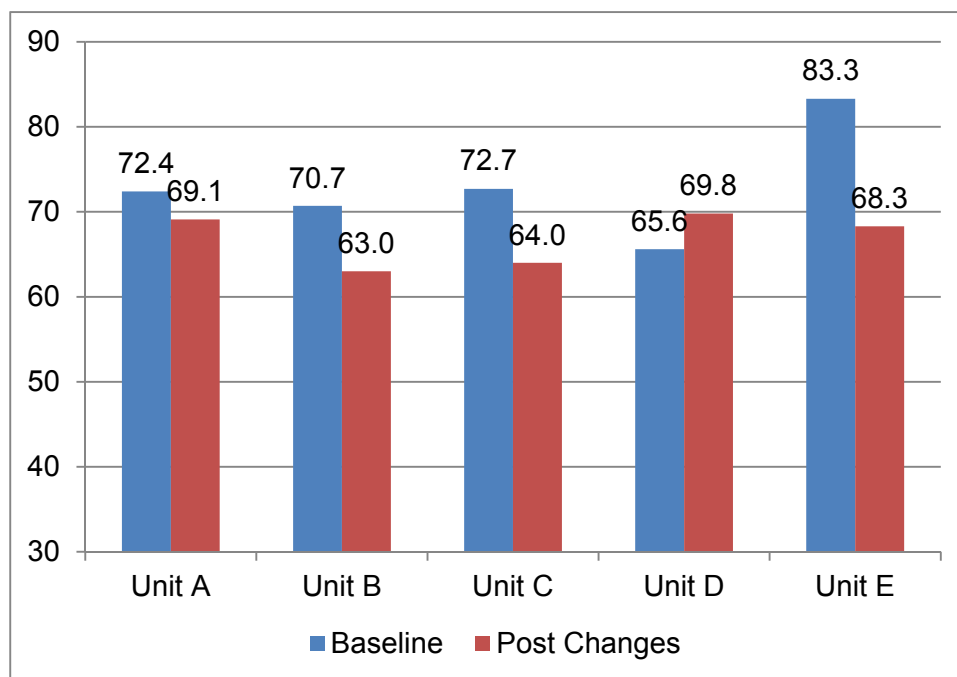


Figure 2: HCAHPS question: How often did nurses explain things in a way you could understand? Weighted average scores for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013) by unit. All units experienced decreased scores except for Unit D. Time B scores declined an average of 5.1 percentage points.

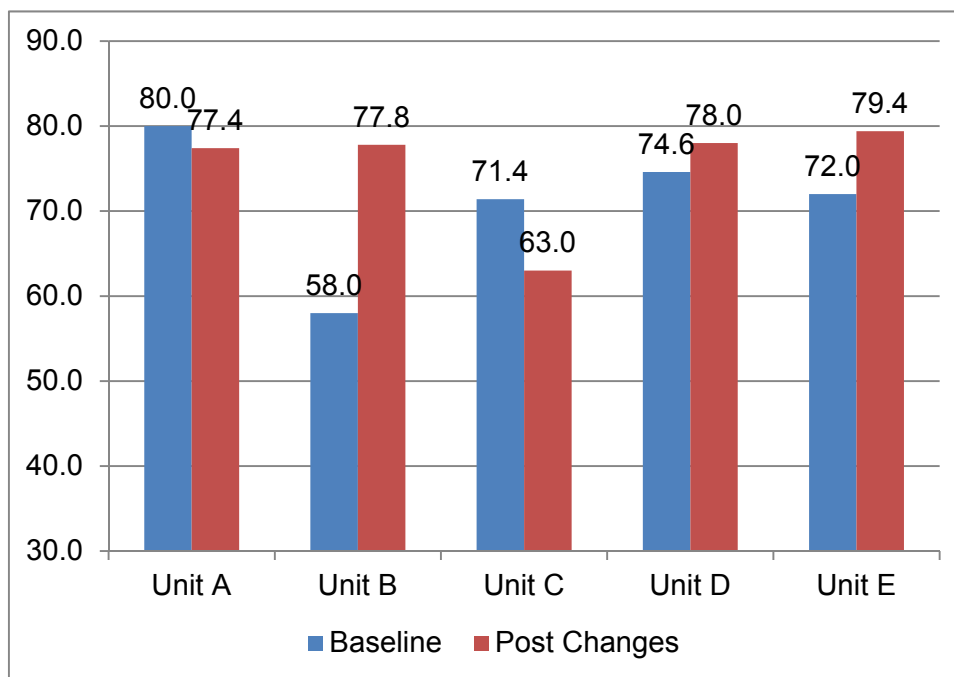


Figure 3: HCAHPS question: How often did the hospital staff do everything they could to help you with your pain? Weighted average scores for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013) by unit. Three of the five unit scores increased for the HCAHPS pain question. Time B scores increased by an average of 4.8 percentage points.

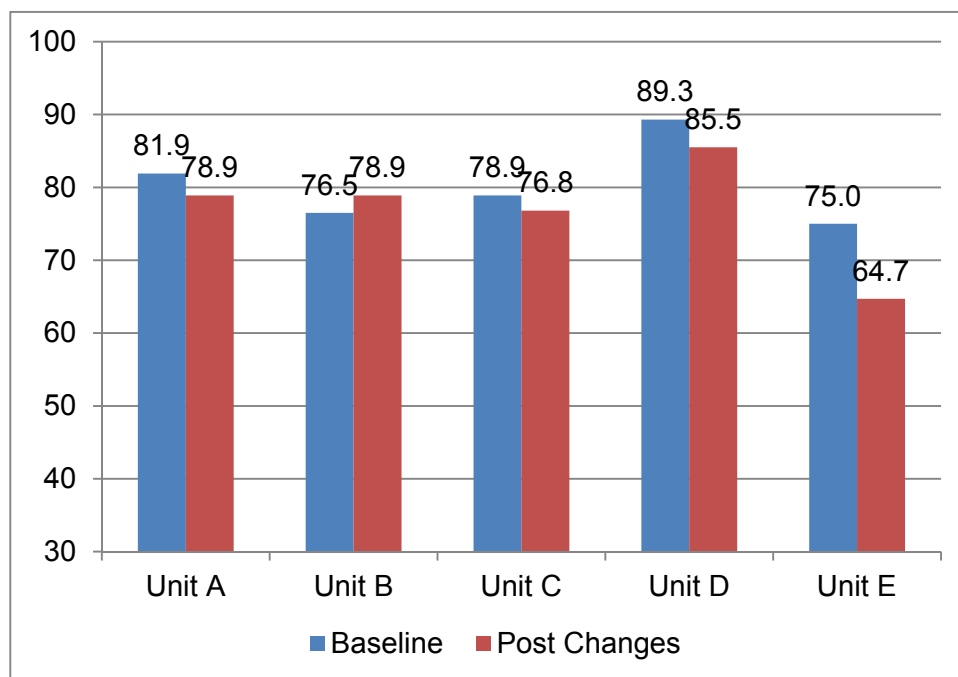


Figure 4: HCAHPS question: Did doctors, nurses and staff talk to you about if you would have the help you needed after you left the hospital? Weighted average scores for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013) by unit. All units experienced a decrease except for Unit B. Time B scores declined by an average of 2.9 percentage points.

Patient Safety Never Events

Two “never events” were selected which are also nursing-sensitive indicators. These were chosen as measures because they could be sensitive to decreases in RN hours of care. They also involve complexities of care processes that are part of the CNL/navigator performance plan. These are measured as numbers of occurrences. A significant improvement was seen with central line associated bloodstream infections (43% reduction) and the hospital acquired-pressure ulcers (stage III or IV) reduced by one to zero.

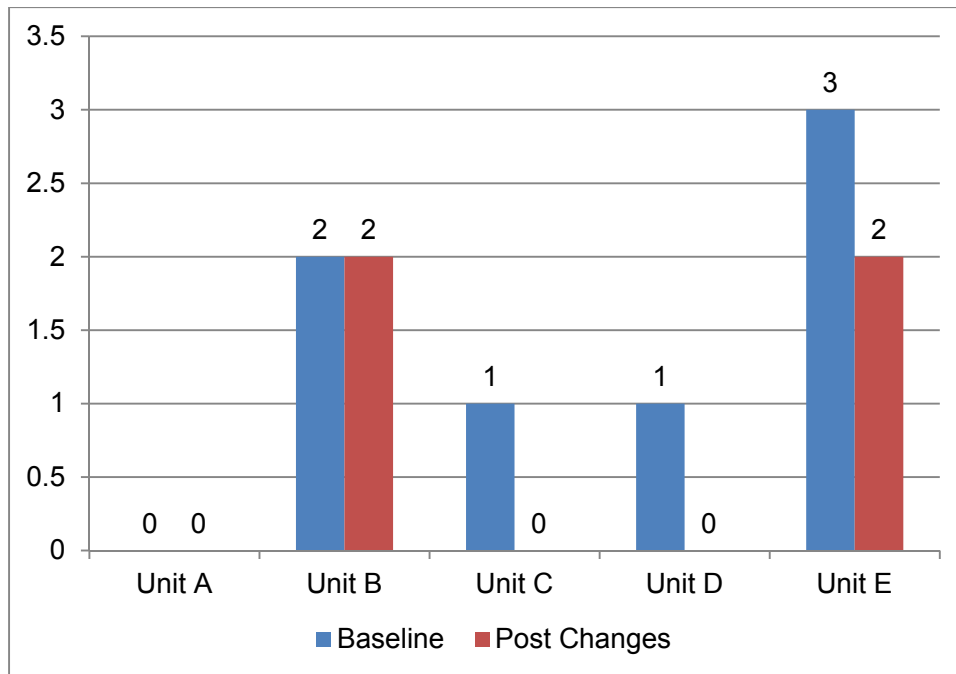


Figure 5: Central line associated blood stream infections (CLBSI). Number of blood stream infections per unit for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013). Time B infections were reduced by 43% from seven to four. All units improved or stayed the same.

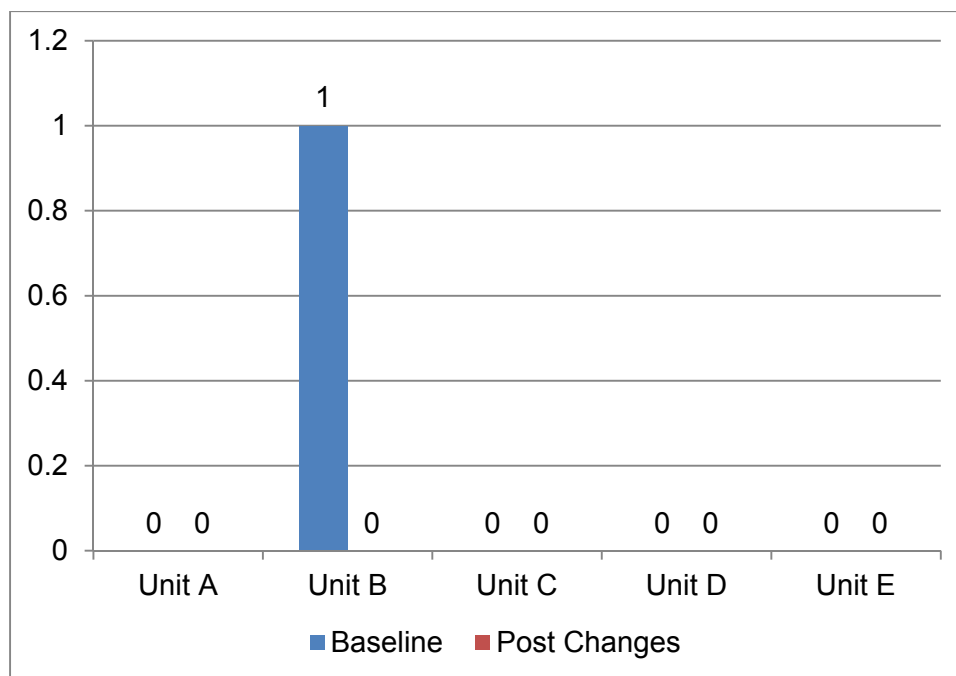


Figure 6: Hospital-acquired pressure ulcers stage III or IV. Number of hospital-acquired pressure ulcers stage III or IV per unit for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013). There were no relevant ulcers in either time frame.

Quality Core Measures

The two core measures, included in the CMS value based purchasing metrics, were chosen because they reflect care coordination, an expectation for CNL/navigators. Metrics were obtained through retrospective abstraction of a statistically significant number of charts. The results are stated in percentages of those patients' charts reviewed who had the measure documented. These metrics are routinely reported at a hospital versus a unit level. The hospital has ten units total. The majority of patients are discharged from the five project units which should influence the discharge instruction core measure. The SCIP measure involving removal of urinary catheters is likely to happen in any of the ten units. Neither of the quality core measure (heart failure discharge instructions and the SCIP measure) improved.

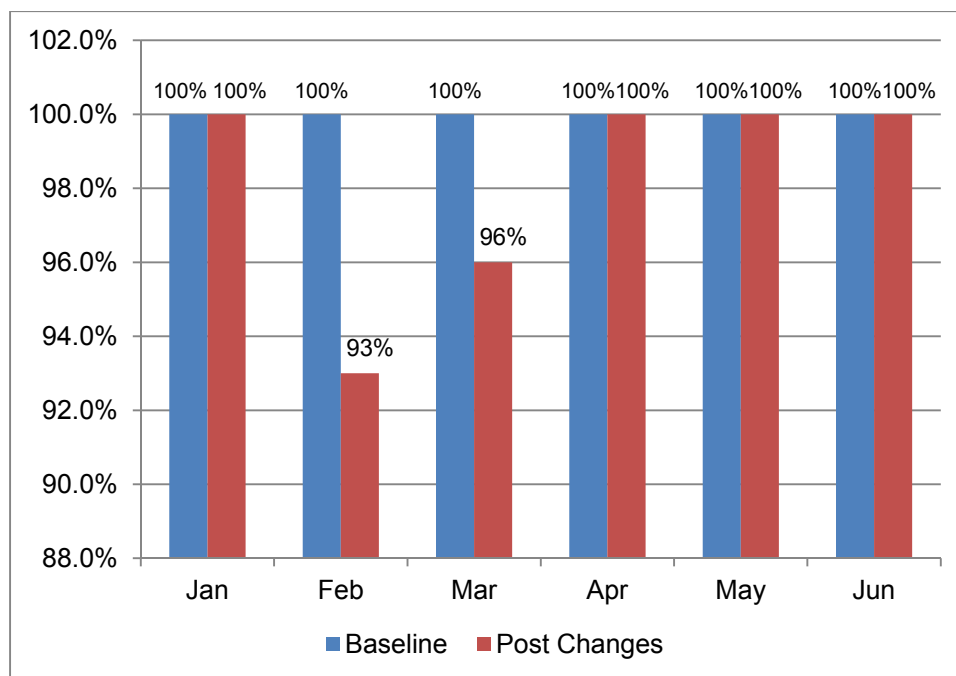


Figure 7: Heart failure discharge instructions documented. Percent compliance for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013). There was a decline in compliance with discharge instructions with an average overall average decrease of 1.8 percentage points.

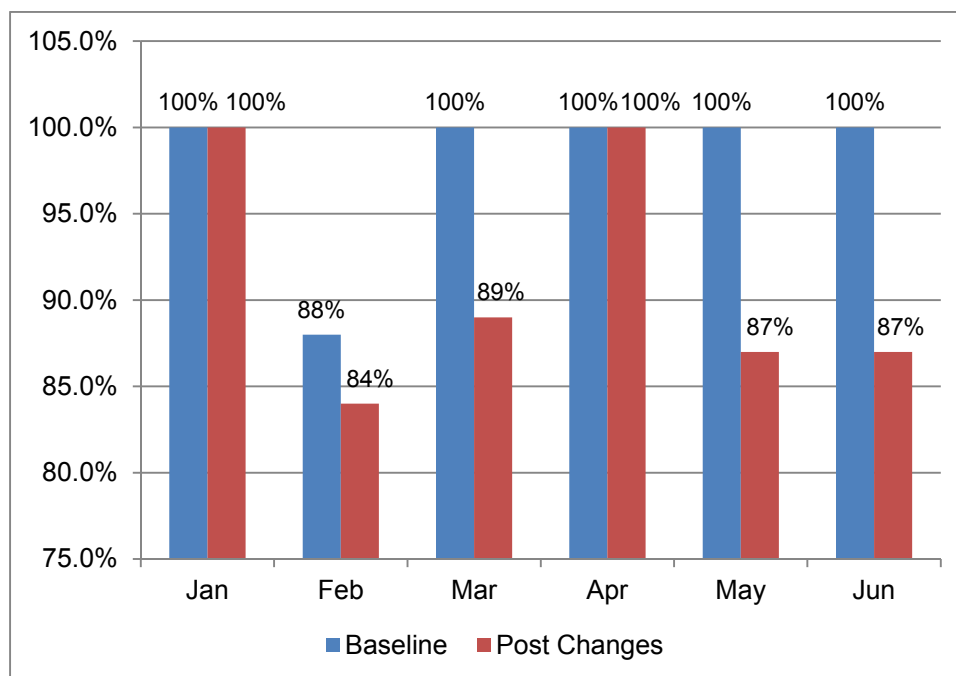


Figure 8: Urinary catheter removal on post-operative day one or two. Percent compliance for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013). The measure declined by an average of 6.8 percentage points.

30 Day Readmission Rates

Three diagnoses; congestive heart failure, acute myocardial infarction and pneumonia were selected as key measures of success. These metrics have been identified by CMS as the most frequent and expensive readmissions. One of the key roles of the CNL/navigator was to coordinate discharge planning and insure continuity of care beyond the hospital stay.

Readmission rates are a metric used to evaluate successful discharge planning and care coordination. Readmission rates are reported at the hospital versus unit level, again reflecting the outcome of all ten units. However, the majority of patients are discharged from the five medical surgical units in the project.

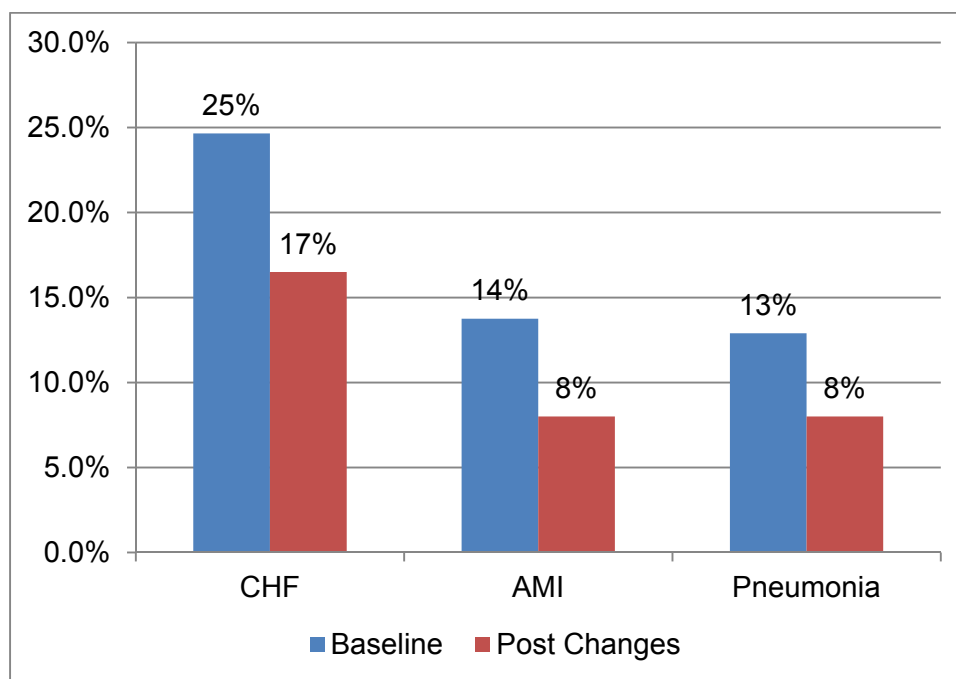


Figure 9: Hospital readmission rates. Percentage of readmissions for baseline, Time A, (January-June 2012) and implementation, Time B, (January-June 2013). Hospital readmissions for CHF, AMI and PNA reduced an average of 6.3 percentage points in Time B.

Summary Data

The table below summarizes the outcomes of the key measures of success post implementation of the modified model of care and the CNL/navigator role (Time B vs. Time A). While there are not enough data points to test for statistical significance, marked improvement was seen in six out of the ten study measures. Unit D displayed improvement across most measures. Central line associated bloodstream infections also improved or remained the same for all units. Patient experience metrics were inconclusive. The most noticeable impact was in 30 day readmission reductions; all three measures improved, cumulatively by 18.8 percentage points.

Table 1: Key Metrics Compare by Unit or Entire Hospital

Unit	Service (HCAHPS)			Safety		Quality Core Measures		Readmissions Hospital Level		
	Nurses explained	Pain Mgmt.	Help Post d/c	CLBSI	HAPU III IV	CHF d/c info	Urinary Cath Removal	CHF	AMI	PNA
Unit A	(3.3)	(2.6)	(3.0)	-	-					
Unit B	(7.7)	19.8	2.4	-	(1.0)					
Unit C	(8.7)	(8.4)	(2.1)	(1.0)	-					
Unit D	4.2	3.4	(3.8)	(1.0)	-					
Unit E	(15.0)	7.4	(10.3)	(1.0)	-					
Total	(5.1)	4.8	(2.9)	(3.0)	(1.0)	(1.8)	(6.8)	(8.2)	(5.8)	(4.9)

Table Notes. Reflects the percentage point change in key measures scores when comparing first six months of implementation (January-June 2013) with baseline (January-June 2012).

Interpretation keys below:

Service, Quality and Readmissions Key:
> 3 % pts. increase
0-3 % pts. increase or decrease
< 3 % pts. decrease

Safety Key:
≤ 1
0
> 0

Chapter Five

The outcomes of the key measures of success for this performance improvement project were variable as illustrated in chapter four. This chapter will review the findings in more detail, explore variables that may have contributed to the outcomes, relate the findings to the literature reviewed, discuss the limitations of the project and the clinical and administrative relevance and implications. Actions taken as a result of the project will be summarized.

The Results

Two questions were the basis for this project:

- How does implementing the role of a CNL/navigator on a medical surgical unit affect quality outcomes and patient satisfaction, and
- Can having a CNL/navigator on a patient care team mitigate the impact of increases in the nurse/patient ratios on quality and satisfaction outcomes?

The outcomes demonstrated that units with the CNL/navigator role and an increased nurse/patient ratio were able to either hold their performance steady or improve it in six of ten metrics.

Service HCAHPS questions. Three questions were used as metrics from the standard HCAHPS questions, each reflecting communication with nurses and the healthcare team.

Patients must answer “always” to count as a positive response. These are direct measures of the time spent communicating and/or the quality of the communication. Increasing the nurse/patient ratio means less time per patient. The question was would the CNL/navigators be able to enhance patient communication and offset the lack of time the direct care RN was able to spend with each patient. Unit A and Unit C saw a decline in all three question responses. Unit B and E

had an improved response to the question about pain management. Unit D had improved responses in both nurses explaining in a way patients could understand and in pain management.

Variables that could have impacted the outcomes for these questions:

- The CNL/navigator role was designed to support one 24 bed unit. The hospital determined to have navigators share units for four of the five units in the project. Only Unit E had its own navigator. Two of the navigators followed 48 patients in two locations.
- While all the units are medical-surgical telemetry units, no attempt was made to analyze the types of patients further to determine if certain diagnoses (put together in a cohort) could impact the answers to the questions. For instance, patients with known painful conditions i.e. sickle cell anemia, might answer pain management questions differently than general medical patients. Further analysis of patient diagnoses could provide more insight.
- Average daily census increased from Time A to Time B. Time A average daily census for all five units was 91.6. Time B average daily census was 97.4, representing a 6% increase in patients. While the nurse to patient ratio should still have been one to six the additional volume of patients on the units could impact the time available for each individual patient.

The data was inconsistent and inconclusive as to whether CNL/navigators could improve the questions that reflect direct communication with patients.

Patient safety/never events. The two indicators selected to measure patient safety are nursing-sensitive indicators which respond directly to nursing time and focus and are measured by the number of occurrences. The frequency of these events was very low at the baseline. Of

note, the units either remained the same or improved for numbers of blood stream infections and only one HAPU stage III or IV was experienced in Time B. As nursing-sensitive indicators these outcomes could have worsened with the decrease in RNHPPD and the increase in average daily census previously reported. The fact that they did not may reflect the influence of many variables. One key variable was the CNL/navigator whose performance plan includes focusing on high risk patients such as these. The high risk patients represent a smaller number than the entire patient population of each unit and could be more effectively screened and managed. The outcomes for these metrics improved.

Quality/core measures and value based purchasing. These measures were abstracted post discharge for patients and reflect the performance of all ten units, not just the five being studied. Patients are discharged from ten units at this hospital. The patients represented by these measures are high risk patients. Discharge instructions for CHF patients are critical to preventing readmissions. Urinary catheter removal by post-operative day two is an evidence-based practice that helps prevent urinary tract infections. These types of patients should have been a focus of the CNL/navigators. The only acceptable goal for these measures is 100%. Both of these measures declined in Time B. Potential variables that could have impacted the results:

- Failure to document discharge instructions does not mean they were not done. While the lack of documentation will impact revenue through the CMS VBP program, the outcome of the CHF readmissions would indicate significant progress was made on this front.
- Urinary catheter removal may occur as frequently in the ICUs and progressive units as in the medical surgical units. The measure reflects activity in the entire hospital, not just the five units being measured. Day two may not be spent on the medical surgical units and the CNL/navigators then would have no way to impact removal on day two.

- Urinary catheter removal requires a physician order and if the physician does not give it or if the staff is too busy to get the order prior to the appropriate date, this measure will be negative.

These outcomes did not improve. It is not possible to determine the impact of the CNL/navigators on these metrics.

30 day readmissions. The three most common and expensive diagnoses were chosen as metrics for this project: CHF, AMI and PNA. Readmission reduction strategies are being used by all disciplines in healthcare including physicians, social workers, discharge planners and nurses. The model of care was derived from the work done in 2010 that demonstrated a reduction in AMI readmissions with a team lead by an ARNP who coordinated appropriate screening, teaching and discharge handoffs. Coordination of care and transitions of care was a key performance expectation for CNL/navigators.

Because patients are discharged and readmitted to different units, these metrics are reported at the hospital level not the unit level. Readmission on day 30 after discharge declined an average of 6.3 percentage points for the three diagnoses across the period of data collection-Time

B. Variables that may have impacted these results in addition to the CNL/navigators:

- The creation of a Transitional Care Division for the system in 2012. This is a multidisciplinary team that works together to improve the structures and processes related to transitions between acute care and community providers.
- Hospital employed physicians, hospitalists, have taken medical directorships at extended care facilities that refer to this hospital in the past 12 months. These physicians have focused on improving clinical care in the facilities and in reducing readmissions through

post-acute care patient management. The extended care facilities are a major source of readmissions.

- The promotion of the patient centered medical home concept in primary care offices where the physicians and their staffs take an active role in comprehensive care management with the goal of reducing readmissions and improving quality of life for their patients.
- The improvement of the medication reconciliation process which helps assure that patients go home with the right medications to correct address their clinical issues.

These outcomes improved across the board and the CNL/navigators may have contributed to that since readmission reduction is a focus of their role.

The Literature's Relevance to the Project

This project was designed as a response to the need to improve quality and decrease costs. That was the challenge of Dr. John Rowe (AACN, 2013, p. 4) and it is the challenge for healthcare in the coming years. Both quality and cost represent a challenge. As the IOM has noted, there has been little movement in the quality and safety of healthcare in the past fifteen years in spite of great effort. The World Health Organization noted that the cost of healthcare remains well above the escalation rate of the GDP. To "bend the cost curve" has become the new by-line in healthcare. This project was an attempt to look at a strategy that could do both in a hospital setting on five medical surgical units.

The CNL/navigator. The literature revealed that adding a master's prepared nurse could be an effective strategy for improving quality but the recommendations were inconsistent as to what elements of quality could be improved because the process of improving quality is always

multifaceted and multidisciplinary. The decision to add the CNL/navigators was supported by the empirical evidence from the pilot as much as from the literature.

Porter-O'Grady, Clark and Wiggins (2010) made a case for the CNL as an agent "capable of managing complex systems of care while raising the quality of outcomes by making improvements at the point of care" (p. 39). They referenced the specialized training in care management and systems thinking as elements of the CNL preparation that would allow them to become "integrators of threads of care provided by many to weave a new fabric of comprehensive, coordinated care" (p. 40).

Because of the inconsistency in the literature relative to the type of master's prepared nurses reviewed, the project design allowed for the CNL/navigator role to be filled by a nurse with formal CNL preparation or other related clinical masters degrees. None of the three navigators in the project had formal CNL education and certification. This created a longer learning curve for the nurses in these roles and one has to ask if results would have been stronger with certified CNLs filling the roles. Continued evaluation of the performance of nurses educated as CNLs versus master's prepared nurses filling a navigator role is warranted.

How did implementing the role of a CNL/navigator on a medical surgical unit affect quality outcomes and patient satisfaction? Six of the ten metrics either stayed the same or improved. It would appear that while inconsistent, the navigators may have had an impact on many of the measures of success. The inconsistent results of the project mirror the inconsistencies found in the literature.

RN staffing and quality. The literature was stronger regarding the relationship of RN hours of care and outcomes. However, the issues of inconsistent designs and definitions, use of administrative data and complexities of care revealed in the literature review left enough

question to say that it was not impossible to reduce RN hours of care without impacting quality. This was the underlying premise of this performance improvement project.

The variables of hours of care and acuity. A review of the RNHPPD revealed the hours were definitely decreased as a result of the increase in the nurse/patient ratio:

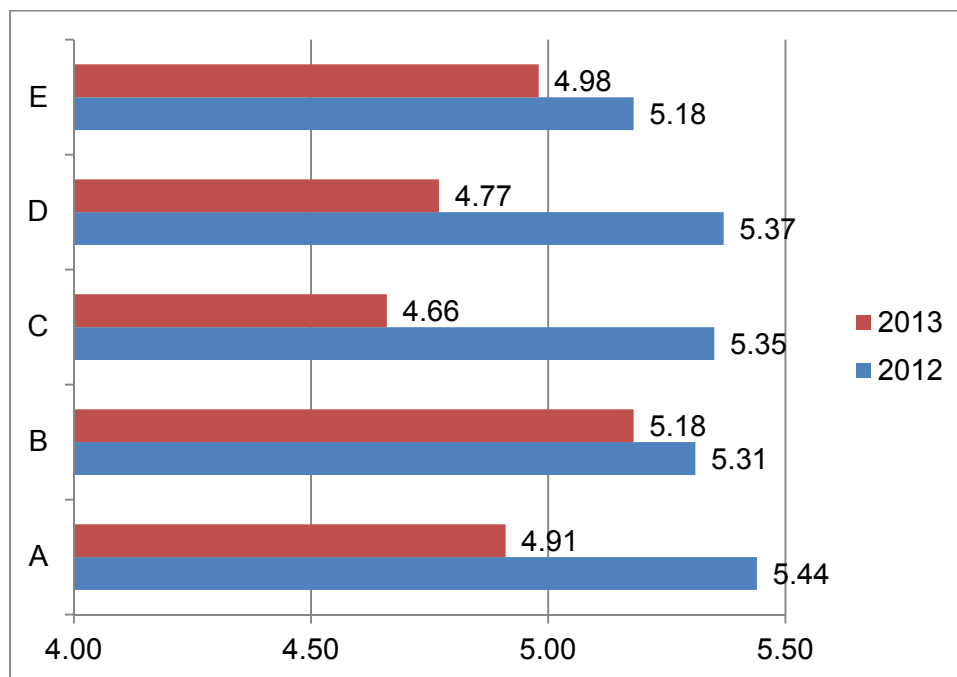


Figure 10. Comparison of average RN hours of care per patient day by unit for Baseline (Time A) and implementation (Time B). Includes direct care nurses only. Excludes assistant nurse managers, nurse managers, educators and CNL/navigators. Likely understated because if staffing is short assistant nurse managers take a patient load but may not be counted in the RNHPPD.

The two units with the lowest RNHPPD, Units C and D had inconsistent results relative to service performance and positive results relative to nursing-sensitive indicators (see Table 1), which is not what would be expected with that level of decrease in RNHPPD. In fact the level of hours for all five units at <5 RNHPPD would place the units in the low staffing category discussed by McHugh et al. (2013) and would place all five units at risk for readmission penalties based on their predictive research. Instead, the hospital experienced significant reductions of readmissions for the three diagnoses penalized by CMS.

During the same time the hours of care were decreased, Time B, the acuity as measured by Case Mix Index increased or remained the same:

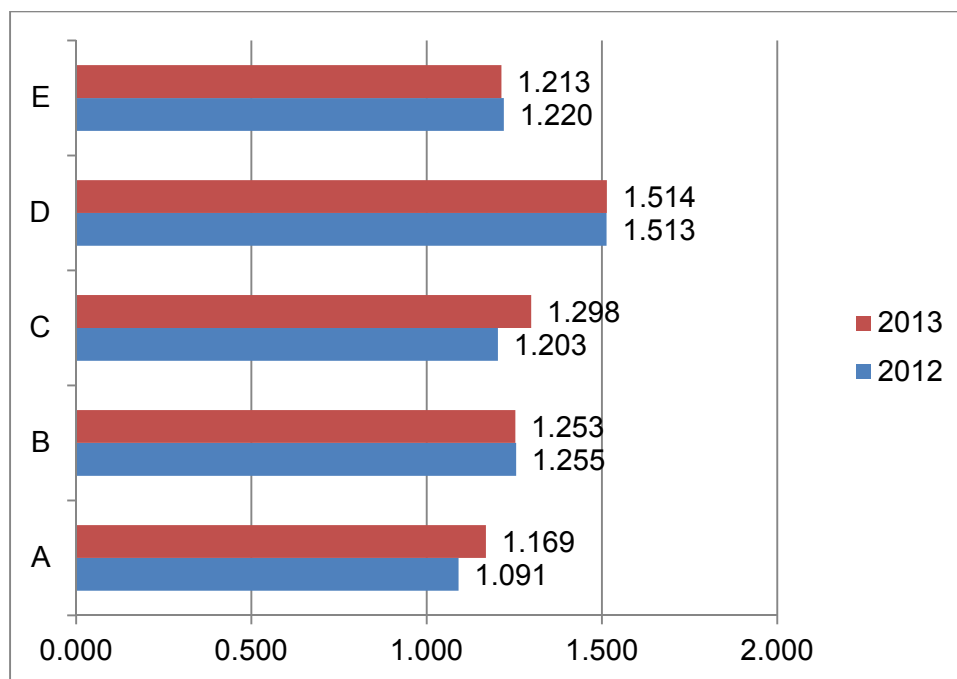


Figure 11. Average Case Mix Index by unit for Baseline (Time A) and implementation (Time B). CMI is a proxy for and a reflection of acuity.

Based on the literature review the expectation would be that with any degree of increased acuity and decreased RNHPPD quality would be impacted. The results are inconsistent across the units. The combination of increasing acuity and decreasing hours of care would empirically speak to declining quality measures. While some did decline, six of ten stayed the same or improved. A key common element on these units is the addition of the CNL/navigator which may have helped to mitigate the impact of these variables, in answer to the second underlying question of the project: Can having a CNL/navigator on a patient care team mitigate the impact of increases in the nurse/patient ratios on quality and satisfaction outcomes?

The variables of staff satisfaction and turnover. Intensity of work, measured by the two variables above, is often cited as a driver of turnover. Within the CNL/navigator performance

plan is the expectation that new staff will be supported and all staff will have care support for the highest risk, most difficult patients. To determine the CNL/navigator impact on staff, an RN satisfaction survey could be conducted. This hospital conducts those surveys every other year and this project was conducted in the off cycle so an RN satisfaction survey was not done. The employee engagement survey was routinely conducted in May 2013. This is given to all employees but the RN job family has segregated results. RNs indicated a lower satisfaction with intensity of work and staffing from the prior survey in 2010. In addition, several comments were made on the survey about the increased nurse/patient ratio and how difficult it was to give the type of care desired.

As part of the communication about the model of care and the evaluation of its effectiveness, senior leadership met with staff in open forums to answer questions and listen to concerns. Feedback affirmed the CNL/navigators helped but echoed the engagement survey relative to the amount of work and the intensity of the work on the medical surgical units. One way to measure staff dissatisfaction is to look at RN turnover for the project time period.

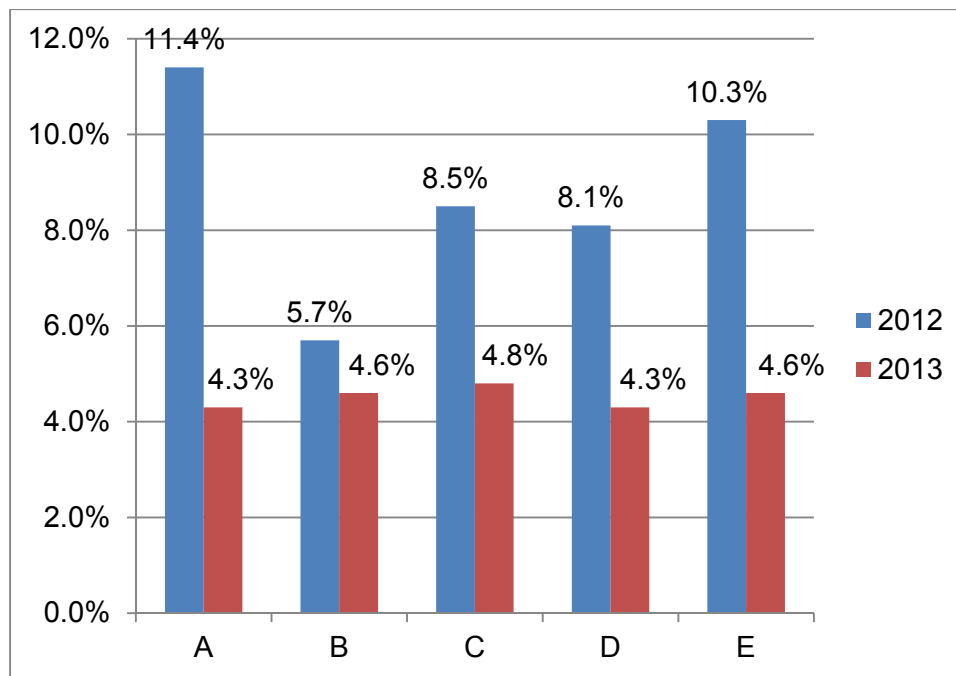


Figure 12. Percent full-time and part-time RN turnover for baseline (Time A) and post-implementation (Time B). Includes voluntary and involuntary turnover.

Many variables can affect turnover, including the leadership of the units, market pay and benefits, organizational culture, etc. There was no turnover of the nurse managers during this time. None of the managers are known to have issues with staff or issues on their units from an HR perspective. There was no market adjustment in salaries during this time. It is possible that the nurse navigators were able to mitigate some of the dissatisfaction by being able to provide expert support to the staff.

Limitations of the Project

The same limitations described in the literature review affects this project. The complexity of the healthcare environment and the complexity of the care processes make it impossible to hold variables constant. While the intent and design of the project were clear, the execution was inconsistent. Some of the inconsistencies that could have impacted the outcome of the project include:

- The varying training and experience of the CNL/navigators.
- The expanded scope relative to units for the CNL/navigators was not supported by the literature.
- The varying practices of physician hospitalists on the units could have enhanced or hampered the quality outcomes.
- The lack of data concerning patient diagnoses and how that would affect outcomes.
- The project was limited to five units in one hospital. As noted in the literature review, it is hard to generalize the results to units other than those studied because of the varying cultures and circumstances on each unit.
- This model represented a significant change in workload and process for the staff. The evaluation was done during the first six months of the project which is still a time of a change and learning. The results may not be generalizable to a longer time period. One might expect the results to continue to improve with time and expertise of team members.
- There are many variables that can affect all of the outcomes measured in both positive and negative ways. The impact of the CNL/navigator on the outcomes cannot be said to be causal but more contributory.

Next Steps

Rogers (2006) developed a model for quality assessment and performance improvement to help organizations meet the CMS requirements. This project was based upon that model (see Figure 1) and the components of the model can be used to tell the story of the project and the next steps for the organization. The model speaks to the fact that hospital leadership is engaged with staff in the assessment of the need for improvement and that together, they collaborate to (a) identify the issue to be improved; (b) develop a multidisciplinary team that will work through

consensus to create the strategic and communication plan; (c) use the hospital structures and processes to execute the plan, modified where appropriate; and (d) review the results and outcomes. This has been the path the project followed through the development, execution and evaluation of the pilot and the implementation of the performance improvement project on the five units.

Rogers emphasizes the need to measure outcomes, review them relative to the strategic initiative set out to complete and evaluate next steps as a team. This process has been followed as well by the hospital and system leadership as clinical and staff satisfaction feedback has been obtained during the Time B measurement and beyond.

The goals of the project, to improve quality while reducing costs, are extremely important as hospitals navigate an uncertain future. The fact that six of ten of the measures were unchanged or positive speaks to the importance of continuing to refine and expand the model of care moving forward. The tendency to add back RNs would be understandable given the passionate feedback of the staff. However when balanced with the relatively positive results, the organization has determined to continue to move forward with the goal of continuing to evaluate each unit's outcomes and staff feedback while looking for ways to improve the model's effectiveness without abandoning the concept.

Achieving top-of-license nursing practice. The Advisory Board (Berkow, Stewart & Virkstis, 2013) had published best practices to help nurses work at the top of their licenses by using technology, workflow redesign, improved interdisciplinary communications and supporting nurses with ancillary staff. The health system has committed to using these strategies and has communicated this to staff through a chief nursing officer memorandum (see Appendix J). A summary of the commitment has been communicated as well to hospital presidents and

nurse executives (see Appendix K). Included in working at the top-of-license are two significant strategies and investments.

The addition of CNL/navigators. Based on the feedback from the CNL/navigators themselves as well as the managers and the staff, positions have been approved to expand the number of CNL/navigators to one per 24 bed unit. Recruitment began three months after the end of Time B. Due to the shortage of trained and certified CNLs it is anticipated that the roles will continue to be filled with other types of master's prepared nurses. As noted previously the impact of not having formally educated CNLs in this position will mean effort and time spent remediating the navigators in care management strategies and a longer time to achieve desired outcomes.

The addition of ancillary care providers. Ancillary care providers (ACPs) can enhance and supplement RN care. Many of the tasks RNs do could be done by non-licensed personnel under the supervision of the RN. ACPs require fewer labor dollars and so extra hours of care could be added at a lower cost. The International Council of Nurses discussed the need to evaluate skill mix for care delivery in the report, *The Global Nursing Shortage: Priority Areas for Intervention*; "in the future a common challenge facing HR managers is determining the most effective mix of staff and skills needed to deliver quality and cost effective patient care in the light of rising demand for health services, cost containment and shortages of nurses and other health workers" (ICN, 2006, p. 11). The need to redesign the work of all care givers, especially nurses was a major element of this work.

While ACPs are not seen as substitutes for RNs they are seen as an adjunct. The key to this being a successful strategy will be the implementation of a strong competency based orientation and development program for ACPs. The outcomes of the performance improvement

project along with staff input led to the board of directors approving \$1.8 million of additional staffing for FY 14, thus reducing the initial system \$4 million savings to half that amount. The hospital that conducted the performance improvement project has been approved for \$690,000, and will hire three more CNL/navigators and 15 ACPs over four months.

Conclusion

While not successful on every front, this performance improvement project has demonstrated that it is possible to improve quality while “bending the cost curve” in these five units. The model of care is an iterative process and requires continuous feedback and assessment as new dimensions are tried. While the initial savings of \$4 million for the entire system has been reduced by \$2 million, there are savings inherent in the improved quality. Bern et al. (2010) estimated that the cost to health one stage IV HAPU was approximately \$128,000 (p. 473). The cost of a central line-associated blood stream infection is estimated to cost \$36,400 (Weeks, Goeschel, Cosgrove, Romig & Berenholtz, 2011, p. 344). Given the quality results seen through this performance improvement project, there may be savings to be gained through the application of the skills brought to bedside care by master’s prepared nurses.

The cost estimates of RN turnover vary widely from \$10,000-\$80,000+, depending upon recruitment costs, orientation costs and costs for temporary labor to fill gaps. Whatever number is calculated there is a financial and cultural cost to turnover that impacts patient safety and staff satisfaction. The decrease in turnover on the project units is not directly correlated with the addition of the CNL/navigator but it bears watching and, if this holds true, the savings from improved retention would finance the additional staff.

This performance improvement project has demonstrated that care process and role redesign have the potential to help improve quality and reduce costs. The data in this project

points to further evaluation and strategic development using evidence-based practices and stakeholder feedback to find ways to improve quality and reduce cost.

Appendix A: Hospital-Acquired Conditions

These 11 categories of HACs listed below include the new HACs from the IPPS FY 2013 Final Rule which are Surgical Site Infection Following Cardiac Implantable Electronic Device (CIED) and Iatrogenic Pneumothorax with Venous Catheterization:

- Foreign Object Retained After Surgery
- Air Embolism
- Blood Incompatibility
- Stage III and IV Pressure Ulcers
- Falls and Trauma
 - Fractures
 - Dislocations
 - Intracranial Injuries
 - Crushing Injuries
 - Burn
 - Other Injuries
- Manifestations of Poor Glycemic Control
 - Diabetic Ketoacidosis
 - Nonketotic Hyperosmolar Coma
 - Hypoglycemic Coma
 - Secondary Diabetes with Ketoacidosis
 - Secondary Diabetes with Hyperosmolarity
- Catheter-Associated Urinary Tract Infection (UTI)
- Vascular Catheter-Associated Infection
- Surgical Site Infection, Mediastinitis, Following Coronary Artery Bypass Graft (CABG):
- Surgical Site Infection Following Bariatric Surgery for Obesity
 - Laparoscopic Gastric Bypass
 - Gastroenterostomy
 - Laparoscopic Gastric Restrictive Surgery
- Surgical Site Infection Following Certain Orthopedic Procedures

- Spine
- Neck
- Shoulder
- Elbow
- Surgical Site Infection Following Cardiac Implantable Electronic Device (CIED)
- Deep Vein Thrombosis (DVT)/Pulmonary Embolism (PE) Following Certain Orthopedic Procedures:
 - Total Knee Replacement
 - Hip Replacement
- Iatrogenic Pneumothorax with Venous Catheterization

http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Hospital-Acquired_Conditions.html

Appendix B: Vision for the Future

The next five years will be a time of challenge and innovation in healthcare. As we face a future whose only certainty is change, it is clear we will need to create new approaches to patient care—approaches that call upon the highest level of critical thinking, creativity and compassion in order to deliver the high quality and excellent patient and family experiences demanded and desired by all involved.

We will create model(s) of care that are patient and family focused. Our model(s) of care will value the professional nurse and will be interdisciplinary and collaborative. We will continue to evolve our professional nurses so that they can create new processes and ways for caring for complex patients in a technology rich, resource-constrained environment.

We will have mixed models of care based upon the needs of our patients and families, but always driven by professional nurses in collaboration with the rest of the healthcare team. We will create models that move us toward higher reliability and accountability. We will embrace standardized practice both for its efficiency and effectiveness, understanding that standardization will free our time for more creative, purposeful work. Nurses will take an active role in transitional care making sure the patient's experience is one of safe, consistent care throughout the continuum.

Baptist Health will continue to be named by the community as having the best nurses, physicians and quality of care. Our work environment will be referred to as an authentic caring and compassionate magnet environment where the art and science of nursing is practiced to the benefit of our patients, families and community.

Nurse Executive Leadership Retreat, May 2011. Revised July 2012.

Appendix C: Clinical Nurse Leader/Navigator Performance Plan

The Clinical Nurse Leader/Navigator is a unit-based masters prepared nurse who works in an interdisciplinary team environment to coordinate the care of complex patients assuring excellent clinical and experience outcomes throughout the continuum of care.

Job Specific Performance Plan I.

Coordination of patient care to improve clinical and experience outcomes (30% weight)

Tasks:

1. Identifies high risk patients upon admission for follow through. Begins planning for discharge at time of admission.
2. Coordinates efforts of interdisciplinary team relative to patient care including rounds, review of a) clinical parameters b) physician orders relative to care paths and nursing staff relative to care plans c) diagnostic tests and results of tests and next steps d) medication reconciliation and follow through
3. Rounds specifically with physicians following patients and with staff where possible to enhance communication
4. Works with social work/case management to effectively plan for discharge from acute setting and establish follow up in community setting

Monitoring and influencing quality and service outcomes (20% weight)

Tasks:

1. Frequently reviews clinical data for core measure compliance, quality outcomes, and patient satisfaction data. Communicates data to team members.

2. Reviews actions of clinical team relative to activities that will enhance quality and service outcomes looking to standardize team performance toward evidence-based practice.
3. Reviews team documentation of quality and experience outcomes and educates team members on areas for enhancement
4. Promotes patient safety by participating and supporting staff in patient safety initiatives.
5. Assures compliance with direct care regulatory requirements/standards
6. Gives feedback for policies and procedures to enhance quality

Education (weight 20%)

Tasks:

1. Serves as expert educator on clinical units providing just-in-time education to enhance competency of staff
2. Serves as education content expert for those developing system-wide education programs
3. Evaluates patient/family education content and delivery, equipping staff to provide excellent education and serves as educator when appropriate
4. Serves as expert in evidence based practice, modeling spirit of inquiry for staff and assisting them in developing their expertise through practice and support.
5. Serves as mentor for EBP and ExCEL projects

Clinical Practice (weight 15%)

Tasks:

1. Serves as expert clinician, providing patient care when necessary or appropriate.

2. Provides nursing interventions within the scope of his/her practice to select patients requiring high degree of skill and knowledge.
3. Models authentic caring science principles as cares for patients, families and team members.

Process Improvement (weight 15%)

Tasks:

1. Applies principles of process improvement to unit based issues to improve care delivery and outcomes.
2. Participates/leads operational performance improvement (OPI) teams as appropriate
3. Reviews care processes with team members to minimize resource utilization and maximize clinical outcomes

Total Weight: 100%

Appendix D: Model of Care Talking Points

Goal: We want to create an environment that enables professional nurses and interdisciplinary colleagues to give exceptional patient/family care in an era of declining resources.

What are we doing? We are creating a new model that represents how we approach patient care at Baptist. There are many types of models of care used in hospitals—primary nursing, team nursing, etc. We have structured our model around the use of the Clinical Nurse Leader/Navigator, professional staff nurses and interdisciplinary colleagues working as a team.

Key elements of the model:

- Model will be initially implemented on medical-surgical units
- Nurses will practice to the limit of their license
- Masters-prepared nurses will be incorporated into the mode of care as CNL/Navigators to help manage outcomes and transitions of care
- We will build upon the successes of our best practices and use evidence-based practices
- Nurses will partner with social services for care management to impact readmissions
- We will broaden and deepen the scope of nurse leaders where appropriate to allow more resources to be focused on direct care
- We will focus on individual and collective accountability for outcomes
- We will evaluate existing processes and determine ways to improve them for the benefit of patients, nurses and other staff

- We will standardize care across the system to become more effective and efficient where it makes sense
- With the support of the CNL/navigators, the budgeted nurse/patient ratios will increase by .5 to 1.0 with an *average* of 1:5.5 on days and 1:6 on nights. Note: budgeted ratios are simply a guideline to anticipate costs and number of positions needed. Actual nurse/patient assignments will be made use ANA Principles of Staffing and are based on patient acuity, nurse experience, unit geography, etc.
- In concert with staffing committees and unit leadership we will evaluate the ACP/HUC roles and ratios to complement other unit changes.
- In concert with our operational performance improvement and quality teams, we will work with unit staff and staffing committees to simplify activities done by nurses
- In concert with staffing committees and unit leadership alter ACP/HUC roles and ratios to complement other unit changes.
- In concert with our operational performance improvement and quality departments, review with the staffing committees and unit staff how to simplify the activities done by nurses and the processes used in care. Our goal is to get the busy work, redundancy and work with little value out of the equation. Two examples of ways we are doing this:
 - the recent change in required documentation for routine patient assessments which allows nurses to document less frequently
 - the implementation of BMDI (real time vital sign entry into the electronic record) in the Downtown ICUs which will eventually be made available across the system

How did we develop this?

- 2010 Nurse Executives, Elaine Myers and Amy Lisenby analyzed patient and nurse-sensitive outcomes looking for correlations. Key findings:
 - Highest quality outcomes for both patients and nurses correlated with BSN percentage, percentage of high performers on unit and staffing hours of care.
 - If unit budgets were to move to Medicare levels of reimbursement, we would not be able to sustain current care model.
- 2010 the Continuum of Care Impact Team formed to look at how system could respond to healthcare reform, specifically the movement away from providing episodic care to managing the health of individuals across the continuum. Key findings:
 - There are nationally recognized best practices related to assessing patients on admission for risk of readmission, educating patients regarding their post-hospital care and coordinating follow up care post-discharge.
 - All of these improve readmission rates and thus quality of life for patients. These are dependent on coordination between staff and physicians and are driven by role of advanced practice nurse.
 - We demonstrated with pilot projects that we can reduce readmissions with the right approach to care management. CHF readmissions reduced by 29% overall.
- 2011 the Model of Care Team formed to look at how to apply the findings from above in order to meet goal of exceptional patient/family care in an era of declining

resources.

Why are we doing this?

- Must improve quality and satisfaction outcomes—in a world of value based purchasing and transparency of outcome results, our results are average at best. These results are posted on federal websites that anyone can access. We do not consider our care average and so need to improve our outcomes.
- Respond to transformation occurring in healthcare delivery. We are moving from episodic, acute care to a more global care where we are expected to keep our patients out of the hospital through more coordinated care in the outpatient arena. Medicare is leading the way to change our methods of care delivery through payment mechanisms like “no pay” events (i.e. wrong site surgery) and will penalize us financially for 30 day readmissions for congestive heart failure, acute MI and pneumonia in October 2012.
- Respond to declining reimbursement. Examples of how this is affecting the system:
 - Over the past two years state cuts in Medicaid reimbursement have resulted in a \$17 million reduction from our bottom line. We are projecting another \$10 million dollar reduction in the 2013 budget in Medicaid and \$12 million in reduction because of changes in commercial insurance plans.
 - Our percentage of self-pay patients continues to increase. Self-pay basically means little to no pay as most people cannot pay medical bills without insurance.
 - More people are covered by high deductible insurance plans meaning they often pay the first \$5,000-\$10,000 in costs, which people struggle to pay.
 - Our percentage of patients covered by traditional, managed care (i.e.

companies like Blue Cross, etc.) is declining. And we know from past experience that commercial insurance companies follow the lead of the government in terms of payment structures. So they are moving toward paying less for hospital acute care visits and expecting more coordinated care.

All of this has resulted in a decrease in our bottom line for the past 3 years with that pattern expected to continue. This represents our “take home pay” or the money left to purchase equipment and supplies, give raises, etc. This pattern necessitates a response just as it does in a personal home budget if there is a decline in money coming in.

Next Steps in Model Development:

- Communication and education for nurse leaders and staff
- Communication to physicians
- Establishing nurse staffing councils, a sub-committee of shared governance where staff will have the ability to learn about the model, apply to their units and work with nurse leaders to implement and modify as time goes on
- Identify ways to improve the work processes on the units through OPI team working with staff

Modified from Version 5: July 2012

Appendix E - Data Collection Tool

Metric	Measure	Data Source	Reporting Period	Data Frequency	Target	Study Hospital UNITS				
						A	B	C	D	E
Service	How often did nurses explain things in a way you could understand? (18879)	NRC Picker		Monthly	80th percentile					
	How often did the hospital staff do everything they could to help you with your pain? (18911)	NRC Picker		Monthly	80th percentile					
	Did Drs, RNs & staff talk to you about if you would have help needed after left hospital? (18935)	NRC Picker		Monthly	80th percentile					
Patient Safety Never Events	Catheter-Associated Bloodstream Infections	Infection Control		Monthly	1 or less per month (FY2013 Target-9)					
	Hospital - Acquired Pressure Ulcers Stage III or IV	Risk Management-		Monthly	0 (FY2013 Target-1)					
Quality Core Measures	Heart Failure: D/C Instructions	CE/PI - NHQM		Monthly	90.8%					
	SCIP - Urinary Catheter Removed on POD1 or POD2 with Day of Surgery being zero	CE/PI - NHQM		Monthly	95.0%					
Readmission (Entire facility)	CHF Readmissions	CE/PI		Quarterly	< 20%					
	AMI Readmissions	CE/PI		Quarterly	< 15%					
	Pneumonia Readmissions	CE/PI		Quarterly	< 15%					
Case Mix Index	CMS weighted CMI	Finance	Fiscal Year	Annual						
RN Hours of Care per Patient Day	Total hours of RN care for patient day or unit of service	Finance	Semi-annual	monthly						
RN Turnover	Number of full and part-time RNs leaving within time period	Human Resources	Semi-annual	monthly						

Key-Targets established by PI and Safety and approved by Board of Directors

Appendix F: Literature Reviewed Matrix

Author Date Title	Level of Evidence Design	Sample	Outcome	Interventions	Results	Limitations
Care Coordination and Role of CNL/navigator Literature by Level of Evidence						
Naylor, M. et al. 2011 The Importance of Transitional Care in Achieving Health Reform	Level I evidence systematic review of RCTs involving transitional care interventions for adults with chronic conditions Used as definition of transitional care: "a broad range of time- limited services designed to ensure health care continuity, avoid preventable poor outcomes among at- risk populations, and promote the safe and timely transfer of patients from one level of care to another or from one type of setting to another. P747	587 articles in English language reviewed, focused on RCTs in United States Ended with 21 RCT 14 single sites 7 multiple sites Participants recruited from inpatient and ED settings Mean sample size 377 Mean age 64.7	Looked at interventions impact on Hospital readmissions and compared components of study to Affordable Care Act provisions	Types of interventions: - comprehensive discharge planning -home visits -disease management -health coaching -education -peer support -telehealth -mobile crises -geriatric assessment -intensive primary care Average post discharge follow up 3 days	Variety of outcomes: -health outcomes -quality of life -pt. satisfaction or perception of care -resource use/readmissions (9 studies demonstrated positive results within 30 days of admission -costs-not calculated well but two studies estimated \$3k savings per Medicare beneficiary at 6 months and \$5k at 12 Average 5.4 months of follow up All but one study reported positive findings in one or more categories Studies did not take into account all elements of ACA Insights from review by authors: -Substantial evidence that transitional care is beneficial -home health and telehealth proved useful -3 studies focused on self-management -comprehensive discharge planning Critical to success Recommendations:	

					<ul style="list-style-type: none"> -interventions should be based on known effectiveness -investments made to get best interventions adopted as evidence for formal bodies i.e. AHRQ -the ACA should incentivize effective models -further research to determine if effective on other populations -need advanced preparation for nurses to assume role 	
<p>Forster, A et al</p> <p>2005</p> <p>Effect of a nurse team coordinator on outcomes for hospitalized medicine patients</p>	<p>Level II evidence-randomized controlled trial</p> <p>Two teaching hospitals in Canada, pts. randomly assigned to regular hospital care or care with a clinical nurse specialist</p> <p>3 month time period for assignment</p>	<p>620 sequential patients CNS=307, Control=313</p> <p>Of those discharged to community : 361 pts. followed up post discharge CNS=175 Control=186</p>	<p>Divided into hospital and post hospital outcomes</p> <p>Looked at mortality, discharge status to community in patient and adverse events, mortality and readmission post-discharge by telephone call 30 days post discharge</p> <p>2 physicians reviewed all discharge symptoms, returns to ED, etc.</p> <p>Pt. satisfaction measured by post-discharge phone call using standardized tool, interviewer</p>	<p>CNS conducted baseline interviews and chart reviews then pts. randomized by study coordinator</p> <p>Physicians had pts. in both groups on service</p> <p>CNS activities on their teams: -retrieving pt./family information -arranging follow up visits -providing pt/family education -post-discharge telephone calls (days)</p>	<p>After adjusting for “confounders” No difference between two groups for -in-hospital mortality -discharged to community</p> <p>Post-discharge no difference in two groups between -readmission -mortality -risk of adverse event</p> <p>Pt. ratings of quality of care higher in CNS group (p=.05)</p>	<p>Had social workers on both teams, may have mitigated results</p> <p>Question about the disconnect between patient perception of quality and actual differences in quality outcomes</p> <p>Small difference between the groups make the fall out of pts. followed more significant</p> <p>Inability to blind subjects</p>

			unaware of pts. study status			
Case, M. 2011 Oncology nurse navigator: ensure safe passage	Level V evidence integrated review of studies looking at nurse navigator, case manager, oncology and continuity of care among others Review from 2000-2010	18 primary nursing studies 12 US, 5 Canada, 1 Sweden	Looking for nurse sensitive outcomes related to time to diagnosis; appropriate treatment; effect on pt. mood and satisfaction; continuity of care and cost	Review results categorized by themes: -Rationale for implementation of nurse navigator—varies by study includes access, information, coordination -study patient populations—primarily breast cancer pts. but not exclusively -educational preparation of navigators—primarily BSN, 2 studies required certification -pt. outcomes—due to negative effect of diagnosis to treatment, key reason for coordination by navigator, time to treatment enhanced for uninsured, removing barriers to treatment, serve as case manager -pt. mood, satisfaction—address fear and lack of information,		Study designs varied widely so serves as information but cannot easily make comparisons Focus on cancer patients may not translate into all diagnoses Studies in multiple countries and patient responses relative to satisfaction and anxiety might be culturally influenced

				<p>decrease anxiety but results vary considerably, while satisfaction measured in many ways, navigators appear to make a difference for patients</p> <p>-continuity of care-several studies had statistics to demonstrate improvement, one study demonstrated that black race, lower socioeconomic group predictive of more case management time needed</p> <p>-costs—no overall cost differences seen</p>		
<p>Nosbusch, J. et al 2010</p> <p>An integrative review of the literature on challenges confronting the acute care staff nurse in discharge planning</p>	<p>Level V evidence-Integrated Review of existing studies</p> <p>1 research at least twice/study</p> <p>Key words focused on discharge planning</p>	<p>Reviewed databases from 1990-2009, found 60 English language articles, 38 met inclusion criteria</p> <p>Used Whittenmore and Knafl methodology for review</p>	<p>Looking for state of science focused on direct care nurses role in discharge planning in acute care setting</p>	<p>Non-interventional review</p>	<p>7 themes identified as barriers for staff successful involvement in patient discharges:</p> <p>1-communication(RN to RN), RN to others, RN to pt./family)</p> <p>2-systems and structures: lack of standardized process or care maps, lack of leadership, lack of tools</p> <p>3-time: lack of RN time, rapid pt. turnover and decreased LOS</p> <p>4-role confusion: whose job is it, lack of clarity between other disciplines or advanced practice nurses</p>	<p>While did not address role of CNL directly, did identify barriers that direct care nurses face which can be addressed by CNL</p> <p>If study focused on direct care nurse, no study was excluded due to design or methodology</p>

					<p>5-care continuity: lack of continuity of assignments so staff didn't know pt./family</p> <p>6-knowledge of community resources and post-discharge care</p> <p>7-invisibility of RN in planning versus activities like assessment and medication administration</p>	<p>y-leads to inconsistent comparisons</p> <p>Various methods of studies reviewed- qualitative, record review, interventions, triangulated data-again inconsistent comparisons</p>
<p>Ott, Karen et al 2009</p> <p>The Clinical Nurse Leader Impact on Practice Outcomes in the Veterans Health Administration</p>	<p>Level VI evidence Integrative review</p> <p>Reviewed 50 VAMC sites that implemented CNLs from 2004-2008</p> <p>Ended up with 7 sites participating in evaluation project: Pre CNL (at least 3 months) and post CNL (six months or greater)</p> <p>Determine if statistically significant differences in quality outcomes</p> <p>Aggregated data for 7 participating centers and also reported</p>	2 reporting facilities	<p>Nursing hours per patient day</p> <p>Cancelation of in and outpatient procedures due to lack of adherence to preparation instructions</p> <p>In one facility: Use of sitters hours as a reflection of CNL drive protocol for dementia</p>	<p>CNL not additive to staff but budget neutral- felt changes due to impact on pt. flow, decision making, support of staff</p> <p>Evaluation of processes, contact with patients and staff regarding instructions</p> <p>CNL drive protocol for</p>	<p>CNL role positively affected NHPPD (+.65, p=.0006) and RNHPPD (+.31, p=.01)</p> <p>Cancelations dropped post CNL i.e. pre CNL pts. were 84% more likely to have a cancellation, post CNL 53% more likely (p=.001)</p> <p>reduction after one year of CNL protocol in sitter hrs./month from 676 hrs./month to 24 hrs./month (p=.001)</p> <p>potential financial savings of \$10,243/month</p> <p>one site data: HAPU prevalence dropped from 12.5% to 4.2% (p=.0025)</p> <p>rate/1,000: decreased from 1.93 to</p>	<p>Convenience samples with a range of time periods and broad sampling of indicators</p> <p>Data collection inconsistent across the 7 sites so results are for only those sites that reported</p> <p>Patient and nurse satisfaction data could not be collected</p>

	individual unit data		<p>patient care</p> <p>HAPU: 5 of 7 facilities looked at this</p> <p>Pt. falls: 2 facilities reported</p> <p>Discharge teaching compliance: 1 facility tracked</p> <p>Ventilator Associated Pneumonia: 1 facility tracked</p>	<p>treatment</p> <p>CNL focused on assessment on admission, staff education and wound care protocols</p> <p>CNLs focused on assessment post procedures, drugs, etc.</p> <p>CNL focused on education and computerized documentation</p> <p>CNL oversaw implementation of VAP bundle</p>	<p>1.37 (p=.21)</p> <p>compliance rate increased from 13% to 90+%</p> <p>incidence of VAP fell from 21.7% to 8.7%</p>	
<p>Stanley, Joan et al</p> <p>2008</p> <p>The clinical nurse leader: a catalyst for improving quality and patient safety</p>	<p>Level VI evidence</p> <p>Case Studies reviewed from 3 different practice settings in same geographic region</p> <p>Using naturalistic approach</p>		<p>Naturalistic approach is what exists, how people feel about it, perceptions and understandings of role</p>			<p>Case study is less rigorous evidence-used as much for early history</p> <p>Sites reported are in various stages of implementation and have different patient populations</p>

		<p>Sample #1 UF/Shands Jacksonville -identified model unit, role, residency experience</p>		<p>#1 CNL placed on oncology unit for residency,</p>	<p>#1: per journal evaluation: 75% time addressing pt. needs, 9% RN needs Falls increased (more reporting) Pt. sat increased</p>	<p>Because of unique outcomes, can only use to point the way to additional research</p>
		<p>Sample #2 USF/Morton Mease Plant -identified 2 pilot units (oncology and med/surg) CNL ratio 15 pts.</p>		<p>Focused on improving communication between units, education inexperienced nurses</p>	<p>3 nurses with intent to leave stayed secondary to CNL (savings of \$150k for hospital) 2 yrs. post implementation, 0 HAPU, 100% compliance with vaccines and CHF education, only 1 fall Decreased LOS in oncology unit Reported improved discharge planning experience for patients</p> <p>RN turnover dropped from 11.2% to 2.6%</p> <p>Customer loyalty increased from 3.25% to 3.64%</p> <p>Core measures: AMI from 90% to 97%; CHF from 91% to 96%; PNE from 80% to 85%</p>	<p>#1: 3 month time period, results not maintained post residency</p>
		<p>Case #3 FAU/St. Lucie Medical Center</p> <p>2 pilot units, progressive and med/surg</p>	<p>Looked for employee engagement scores, customer loyalty, quality and cost measures</p>	<p>Given specific tasks of interdisciplin ary care planning, MD liaison, resource management, EBP promotion</p>		<p>No pre- CNL data available for comparison for nurse sensitive indicators</p> <p>Much outcome qualitative reported by CNLs</p>

		CNLs assigned 18-23 pts. and had team of 3 RNs and 2 assistants				Anecdotal to these units No statistical analysis done for significance
Bartels, Jean, et al American Association of Colleges of Nursing February 2007 White Paper on the Education and Role of the Clinical Nurse Leader™	Level VII Review of state of healthcare system via IOM studies, Joint Commission, American Hospital Association, Robert Wood Johnson Foundation	Experts in practice and academic preparation contributed to white paper	Made recommendations for CNL role and education Gave ten assumptions regarding preparation that emphasized evidence based practice and patient outcomes as measure of success of role Defined role with emphasis on assessing populations, coordinating care, implementing solutions for care, education all which happen at point of care meaning this is a practice masters		Recommendations from committee include <ul style="list-style-type: none"> • Education requirements • Role definitions • Core competencies identified • Professional values, ethics and expectations identified 	Not study per se but review of state of nursing and reasons for role creation
Impact of Staffing Literature by Level of Evidence						
Butler M, et al	Level I Evidence Systematic	Systematic Review	-Patient mortality -Patient risk-	Purpose to explore the effect of hospital nurse	Quality of evidence limited	The studies used were graded

<p>2011</p> <p>Hospital nurse staffing models and patient and staff-related outcomes.</p>	<p>review</p> <p>Reviewed all published and unpublished, no restrictions on time, country or language</p> <p>Used “Cochrane Effective Practice and Organisation of Care” Review Criteria (EPOC). Study types: randomized control trials, controlled clinical trials, controlled before and after studies, interrupted time series analyses of interventions</p> <p>Identified 6,202 studies initially, 486 potentially relevant studies; 15 met final criteria for review</p>	<p>Searched 9 databases plus thesis listings, government & nursing reports, all years</p> <p>Included: 8 RCT 2 CCT 5 Cbas</p> <p>4 studies looked at staffing models 11 studies looked at skill mix specifically at 1) addition of nurse specialist to usual staffing 2) increasing proportion of support staff</p> <p>Interventions well described as -addition of masters-prepared nurse specialist -addition of ancillary help -self scheduling - implementation of primary care nursing</p>	<p>adjusted mortality</p> <p>-In-hospital deaths</p> <p>-patient length of stay</p> <p>-readmission rates</p> <p>-attendance at ED post discharge</p> <p>-staff sick leave rates</p> <p>-staff turnover rates</p> <p>Nurse sensitive patient outcomes:</p> <p>-infections</p> <p>-falls</p> <p>-HAPU</p> <p>-medication errors</p> <p>-complications</p>	<p>staffing models on patient and staff outcomes because insufficient evidence exists relative to impact</p>	<p>No evidence that addition of nurse specialists results in decreased pt. deaths, ED visits or readmission rates</p> <p>Evidence that reduces pt. LOS (mix results) and pressure ulcers</p> <p>Increase of support staff leads to decrease in mortality (present in 2 studies only)</p> <p>Improvement in retention with self-scheduling and primary care</p> <p>Suggested increased cost when support staff increased</p> <p>Suggested that addition of non-RN support can impact pt. outcomes</p> <p>No evidence of staffing mix or levels or educational impact</p>	<p>“moderate” in evidence quality- authors felt further research could have impact on confidence in conclusions</p> <p>Meta-analysis limited due to small number of studies included due to lack of other studies meeting EPOC criteria</p> <p>Risk of Bias ran between low to high for included studies</p> <p>Only two studies addressed costs of staffing models</p>
<p>Brennan, C.W. et al</p> <p>2013</p>	<p>Level I Systematic Review of Reviews to</p>	<p>112 reviews with 8 systematic reviews and</p>	<p>Examined association between nurse staffing and</p>	<p>Possible reasons cited for inconsistencies:</p>	<p>Overarching theme identified is that statistically significant</p>	

<p>State of the Science: The Relationship Between Nurse Staffing and Patient Outcomes</p>	<p>explore why no evidence based guidelines exist regarding nurse staffing</p> <p>Used methods from Centre for Reviews & Dissemination on review of reviews</p> <p>Focused on review articles with goal to recommend future directions for nurse staffing research</p> <p>Inclusion: acute care hospitals, effects of nurse staffing on patient outcomes, using SR or reviews of literature, Excluded primary research articles</p> <p>Used two author review-first then second did 10% of first</p>	<p>21 literature reviews met inclusion criteria</p> <p>Conducted quality assessments of those articles that qualified, looking to see if primary articles used in review met quality criteria at time of review</p>	<p>patient outcomes</p> <p>Found groundbreaking articles Aiken, et al 2002, Needleman, et al 2002 demonstrated association between nurse staffing and outcomes but specific recommendations remained unclear</p> <p>Differences in outcomes found when referring to ratios versus HPPD or RN HPPD versus all staff HPPD</p> <p>Also definition of patient outcomes highly variable</p> <p>Hospital data often omitted—experience level of nurse, BSN, etc.</p> <p>Outcomes vary by study and some have strong association i.e. Needleman 2001 surgical outcomes relative to RN staffing with 4-6% decrease in outcome</p>	<p>-data often comes from payroll/budget systems and can't distinguish direct versus indirect care hours or when nurses who float from home unit and are not as comfortable</p> <p>HPPD does not account for patient turnover, admits or discharges</p> <p>Inconsistencies in primary studies exist in part because of variability of data sources, approaches to measuring nurse staffing and patient outcome variables and processes used in care</p> <p>Discussed that even definitions in AHRQ, NQF and ANA have only two indicators that overlap: BSI and HAPU</p> <p>Use of observational study designs versus RCTs because can't really do an RCT for patient care can't randomly assign to different models and units</p> <p>You trade off time/money for less reliable data, less valid (low samples, etc.)</p>	<p>associations exist between nurse staffing and some patient outcomes, which indicates a trend toward improved patient outcomes with increased nurse staffing (pg. 765)</p> <p>But because of inconsistent results in primary studies, evidence remains inconclusive</p> <p>Example: 14 reviews of nurse staffing and HAPU found higher staffing associated with lower rates but several studies found no association (768) one even suggested it increased due to increased surveillance</p> <p>Questioned whether inconsistencies due to methodological variability, insufficient data, reliability of data or true lack of statistical significance. Also could not tell if relationships were causal due to predominance of observational versus controlled studies</p> <p>Not a lot of discussion about the theoretical basis for the relationship between nurse staffing and patient</p>	
---	--	---	---	--	---	--

	looking for agreement		<p>Aikens work showed significant increase in mortality and failure to rescue by &5 for each increase in patients assigned to nurses</p> <p>Mark et al demonstrated diminishing returns with staffing</p> <p>Donaldson found even with increased ratios in California nurse sensitive quality indicators did not improve</p> <p>Often primary studies used unit level data which tended to show effect of nurse staffing on pt. outcomes more significant than hospital based but the numbers were much smaller and are not as generalizable</p> <p>Design flaws numerous, dependence on weaker statistical analysis, less sophisticated techniques like regression analysis</p>	<p>When use administrative databases subject to error prone diagnoses codes and minimal adjustment for confounding variables and under reporting of adverse events</p>	<p>outcomes</p> <p>Didn't account for system factors in studies such as the care processes</p> <p>Propose a theoretical framework The Integrated Framework for a Systems Approach to Nurse Staffing Research aims to make explicit the various factors that are thought to mediate and moderate the relationship between nurse staffing and patient outcomes by looking at structure/process/o utcomes compared to patient/nurse/unit/s systems issues</p> <p>Finally importance of distinguishing between statistical and clinical significance</p> <p>“Inconsistencies across primary studies and inconclusive results inhibit translation of findings into clinically meaningful recommendations which has caused efforts to establish evidence-based staffing guidelines to stall in recent years.” (786)</p> <p>Recommend thinking about new</p>	
--	-----------------------	--	--	--	---	--

			<p>Also difference in timing between nurse staffing data and patient outcome data makes it difficult to interpret impact of staffing changes</p> <p>To use regression analysis must assume variables vary in a linear fashion nurse staffing and pt. outcomes often varied in non-linear ways</p> <p>Emphasized use of appropriate statistical analysis and model, need to adjust for non-linearity and look at baselines before making assumptions— if rate of problem already low will see less impact that if higher even if increase staffing</p> <p>Need to define clinical significance vs. statistical significance often see term substantial</p>		<p>research versus continue to analyze old for the reasons mentioned</p> <p>Use systems approach, research designs that provide a higher likelihood of establishing causal relationships among variables rather than continuing to use observational and cross-sectional research designs</p> <p>i.e. testing interventions focused on redesigning nurse work flow or effect of patient acuity based nurse assignment decisions on outcomes</p> <p>particular attention to identifying organizational characteristics, processes of care and unit level contextual factors that contribute to patient recovery</p> <p>also study the complexity of the work on situation levels, how do nurses contribute to safety and outcomes</p>	
--	--	--	---	--	--	--

			<p>change but no definition of what that is</p> <p>Question value of current nurse staffing measures in terms of their ability to really capture and reflect work of nurses</p>			
<p>McHugh, Matthew; Berez, Julie; Small, Dylan</p> <p>2013</p> <p>Hospitals with Higher Nurse Staffing had Lower Odds of Readmissions Penalties than Hospitals with Lower Staffing</p>	<p>Level IV Evidence</p> <p>Case controlled study looking at acute care hospitals in US and comparing potential CMS readmission penalties with their RNHPPD</p>	<p>Used CMS Hospital Readmissions Reduction Program data for FY 13 for adult, non-governmental acute care hospitals with min. 25 cases of CHF, PNE, AMI between July 1, 2008 and June 30, 2011</p> <p>2826 hospitals</p> <p>Used CMS formula to determine if will be subject to readmission penalty</p> <p>Used AHA administrative data on RN HPPD</p> <p>Categorized low staffing (5.1 HPPD) and high staffing (8.0</p>	<p>Matched hospitals that would be penalized, no penalty, attempted to remove bias</p> <p>Matched hospitals on structural and patient mix</p> <p>Categorized hospitals on 5 quintiles of nurse staffing variables and looked at odds of being penalized based upon staffing variable</p> <p>28% no penalty 9% maximum penalty 63% some penalty</p> <p>Comparing all 3 categories, hospitals with higher nurse staffing had 25% lower odds of being penalized</p>		<p>Difference between hospitals in lower and higher staffing group was 2.9 RNHPPD</p> <p>Defined Low Staffing as 5.1 RNHPPD High staffing as 8.0 RNHPPD</p> <p>Consider RN staffing as a solution to meeting CMS VPB programs</p> <p>Consider structural support for staffing at state and federal levels (i.e. legislation)</p>	<p>Used AHA administrative data which is only as good as definitions and report but it is reported nationally by all hospitals</p> <p>Does not address actual number of readmissions but readmission penalties which is different. Penalties derive from observed vs. expected numbers in the overall pool</p> <p>Have no way of knowing how much time nurses spent with patients with three</p>

		HPPD) Corrected for patient demographics, regions, FP or NFP status, operating margin, etc. to get a close a match as possible.	If just compare maximum penalty hospitals against all others higher nurse staffing had 41% lower odds of being penalized			diagnoses studied Cannot infer causal relationship as other mechanisms could be in play as well as RN staffing
Patterson, Jennifer 2011 The effects of nurse to patient ratios	Level V evidence Double-blinded peer reviewed literature review Looking at impact of staffing on patient outcomes- Do high nurse/patient ratios cause negative outcomes for patients?	Reviewed 15 studies over past 10 years in US and UK Looking at impact of staffing	Aiken: ratios ranged from 1:4 to 1:8 Rafferty replicated Aiken's study in UK with similar results Maben: UK study, new RNs and burnout in 2 years Needleman: failure to rescue linked to poor staffing, also nurse sensitive outcomes Several		Aiken: Poorest staffing led to 31% greater mortality and increased job dissatisfaction Would better staffing alleviate stress and burnout?	Aiken: surgical units only Question asked, no data to answer No evidence to support "ideal" staffing ratios (suggestions of 1:4 but no evidence) No information about non-nursing staff impact Studies observational not interventional Data

			studies looked at not just staffing but staff competency, physical environment, communication, hours actually spent on patient care			collection is inconsistent and difficult to interpret Acuity not taken into account in studies
--	--	--	---	--	--	---

Appendix G: Baseline Data

Appendix G - Completed Data Collection Sheet-Specific Key Measures																							
Baseline (Jan - Jun 2012)																							
Study Hospital				Unit A						Unit B						Unit C							
Metric	Measure	Data Source	Data Frequency	Jan	Feb	Mar	Apr	May	Jun	Jan	Feb	Mar	Apr	May	Jun	Jan	Feb	Mar	Apr	May	Jun		
Service	How often did nurses explain things in a way you could understand? (18879)	NRC Picker	Monthly	61.5	76.5	64.7	78.6	83.3	71.4	69.0	60.0	55.6	77.8	80.0	71.4	83.3	81.3	66.7	63.6	65.0	75.0		
	How often did the hospital staff do everything they could to help you with your pain? (18911)	NRC Picker	Monthly	66.7	75.0	92.3	81.8	81.8	81.8	50.0	77.8	50.0	43.8	85.0	40.0	90.0	66.7	61.5	66.7	62.5	83.3		
	Did Drs, RNs & staff talk to you about if you would have help needed after left hospital? (18935)	NRC Picker	Monthly	66.7	87.5	100.0	85.7	66.7	78.6	100.0	62.5	54.5	82.3	65.0	76.9	68.8	87.5	75.0	90.0	70.6	86.7		
Patient Safety Never Events	Central Line Associated Bloodstream Infections	Infection Control	Monthly	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0		
	Hospital - Acquired Pressure Ulcers Stage III or IV	RM / WC	Monthly	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		
				Facility																			
Quality Core Measures	Heart Failure: D/C Instructions	CE/PI - NHQM	Monthly	100%	100%	100%	100%	100%	100%														
	SCIP - Urinary Catheter Removed on POD1 or POD2 with Day of Surgery being zero	CE/PI - NHQM	Monthly	100%	88%	100%	100%	100%	100%														
					Facility																		
Readmissions (Entire facility)	CHF Readmissions	CE/PI	Quarterly	22.5%		26.8%																	
	AMI Readmissions	CE/PI	Quarterly	16.0%		11.5%																	
	Pneumonia Readmissions	CE/PI	Quarterly	11.0%		14.8%																	

Appendix G: Continued

Appendix G - Completed Data Collection Sheet-Specific Key																							
Baseline (Jan - Jun 2012)																							
Study Hospital				Unit D						Unit E													
Metric	Measure	Data Source	Data Frequency	Jan	Feb	Mar	Apr	May	Jun	Jan	Feb	Mar	Apr	May	Jun								
Service	How often did nurses explain things in a way you could understand? (18879)	NRC Picker	Monthly	80.0	66.7	63.6	60.0	70.0	53.8	0.0	0.0	0.0	90.9	73.3	87.5								
	How often did the hospital staff do everything they could to help you with your pain? (18911)	NRC Picker	Monthly	100.0	60.0	73.3	83.3	77.8	50.0	0.0	0.0	0.0	100.0	54.5	80.0								
	Did Drs, RNs & staff talk to you about if you would have help needed after left hospital? (18935)	NRC Picker	Monthly	93.3	84.6	94.1	78.6	88.9	100.0	0.0	0.0	0.0	70.0	66.7	86.7								
Patient Safety Never Events	Central Line Associated Bloodstream Infections	Infection Control	Monthly	1	0	0	0	0	0	0	0	1	0	0	2								
	Hospital - Acquired Pressure Ulcers Stage III or IV	RM / WC	Monthly	0	0	0	0	0	0	0	0	0	0	0	0								
Quality Core Measures	Heart Failure: D/C Instructions	CE/PI - NHQM	Monthly																				
	SCIP - Urinary Catheter Removed on POD1 or POD2 with Day of Surgery being zero	CE/PI - NHQM	Monthly																				
Readmissions (Entire facility)	CHF Readmissions	CE/PI	Quarterly																				
	AMI Readmissions	CE/PI	Quarterly																				
	Pneumonia Readmissions	CE/PI	Quarterly																				

Appendix I: Comparison of Time A to Time B

Appendix I - Key Measure Variance (Jan - Jun 12 vs Jan - Jun 13)
Baseline Compare

Study Hospital				Unit A						Unit B						Unit C					
Metric	Measure	Data Source	Data Frequency	Jan	Feb	Mar	Apr	May	Jun	Jan	Feb	Mar	Apr	May	Jun	Jan	Feb	Mar	Apr	May	Jun
Service	How often did nurses explain things in a way you could understand? (18879)	NRC Picker	Monthly	9.9	-22.0	0.0	-7.2	-16.6	14.3	31.0	40.0	19.4	-33.4	3.3	-11.4	-26.2	-21.3	-4.2	9.1	-2.5	-17.9
	How often did the hospital staff do everything they could to help you with your pain? (18911)	NRC Picker	Monthly	13.3	-19.4	-10.5	-1.8	-4.9	18.2	26.2	-2.8	3.8	-8.5	-12.3	26.7	-40.0	3.3	17.1	-2.0	-12.5	-8.3
	Did Drs, RNs & staff talk to you about if you would have help needed after left hospital? (18935)	NRC Picker	Monthly	16.6	-9.7	-14.3	-2.4	2.1	0.0	-15.8	4.2	30.1	-0.5	10.0	0.9	-11.7	1.4	9.6	-10.0	9.4	-11.7
Patient Safety Never Events	Central Line Associated Bloodstream Infections	Infection Control	Monthly	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0
	Hospital - Acquired Pressure Ulcers Stage III or IV	RM / WC	Monthly	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0
				Facility																	
Quality Core Measures	Heart Failure: D/C Instructions	CE/PI - NHQM	Monthly	-	(7.0)	(4.0)	-	-	-												
	SCIP - Urinary Catheter Removed on POD1 or POD2 with Day of Surgery being zero	CE/PI - NHQM	Monthly	-	(4.0)	(11.0)	-	(13.0)	(13.0)												
				Facility																	
Readmissions (Entire facility)	CHF Readmissions	CE/PI	Quarterly	-7.5	-8.8																
	AMI Readmissions	CE/PI	Quarterly	-6.0	-5.5																
	Pneumonia Readmissions	CE/PI	Quarterly	-2.0	-7.8																

Appendix I: Continued

Appendix I - Key Measure Variance (Jan - Jun 12 vs Jan - Ju
Baseline Compare

Study Hospital				Unit D						Unit E					
Metric	Measure	Data Source	Data Frequency	Jan	Feb	Mar	Apr	May	Jun	Jan	Feb	Mar	Apr	May	Jun
Service	How often did nurses explain things in a way you could understand? (18879)	NRC Picker	Monthly	0.0	-11.1	25.3	27.5	14.6	6.2	66.7	100.0	100.0	9.1	-6.6	-20.8
	How often did the hospital staff do everything they could to help you with your pain? (18911)	NRC Picker	Monthly	-38.9	11.4	5.3	-16.6	-0.5	5.6	65.2	88.9	50.0	-20.0	5.5	-24.4
	Did Drs, RNs & staff talk to you about if you would have help needed after left hospital? (18935)	NRC Picker	Monthly	-13.3	7.1	-9.5	8.9	-7.9	0.0	73.7	42.9	75.0	18.9	-66.7	-24.2
Patient Safety Never Events	Central Line Associated Bloodstream Infections	Infection Control	Monthly	-1	0	0	0	0	0	0	1	0	0	0	-2
	Hospital - Acquired Pressure Ulcers Stage III or IV	RM / WC	Monthly	0	0	0	0	0	0	0	0	0	0	0	0
Quality Core Measures	Heart Failure: D/C Instructions	CE/PI - NHQM	Monthly												
	SCIP - Urinary Catheter Removed on POD1 or POD2 with Day of Surgery being zero	CE/PI - NHQM	Monthly												
Readmissions (Entire facility)	CHF Readmissions	CE/PI	Quarterly												
	AMI Readmissions	CE/PI	Quarterly												
	Pneumonia Readmissions	CE/PI	Quarterly												

Appendix J-Communication with Staff

Together, we have done a tremendous amount of work to respond to an increasingly complex healthcare environment. We have met and overcome many challenges, and we have continuously asked for and listened to feedback from direct caregivers.

Based on that feedback, it is evident that more work remains to be done to ensure our staffs feel they have adequate resources and support to reach our vision of providing excellent care. We see this evidence reflected in our quality and patient satisfaction results and our employee engagement, physician satisfaction and NDNQI surveys.

In response, our leadership is now reviewing all aspects of care provision and developing strategies for review with unit leaders in the next few weeks. There is no one answer to the various issues on our multifaceted units, so we will be evaluating multiple strategies and dimensions of the care environment, including:

- Optimizing the EMR for our nursing staff.
 - How do we accelerate our work in eliminating unnecessary documentation and “clicks” through the record? These reduce time with the patient.
- Evaluating clinical leadership support available to any given unit.
 - Does the unit need a role like the ANM? Does a unit need one manager or could one manager have two units?
- Assessing the scope of practice of our ACPs.
 - Could they do more if provided appropriate education and preparation? Do we need more ACPs on any given unit because of the heavy physical work expectations?
- Evaluating the role of the CNL/navigator.

- This role was designed for specific medical-surgical units where the numbers of patients each nurse cares for is higher and where patients had significant care and discharge needs.
- Do we have medical surgical units without a navigator who could be helped by the addition of a navigator? Do we have navigators on units that would be better served by educators?
- Evaluating the care processes on units.
 - Are they designed to use technology where possible, to provide clear protocols for nursing treatments, to minimize rework?
- Evaluating the supplies and equipment used to get work done.
 - Is there enough of the right thing?
- Applying evidence-based practice
 - Work with shared governance to evaluate how each unit can use proven practices to get better results.
- Improving processes and efficiencies
 - Do we have the right equipment, technologies and tools in place?

The leadership of our organization is committed to reviewing all of these strategies and providing resources where possible to improve situations. As we work together to change health care for good, it's important that we recognize appropriately staffing patient care units is not about ratios. It's about the complexity of care and meeting that complexity with the right resources – people and equipment.

We have two exciting technology solutions coming within the next year that will provide an opportunity to look at how and why we do what we do:

- Clairvia, a patient acuity system that will interface with the Cerner platform and allow us to staff to acuity, project census and allow staff to self-schedule via a web interface.
- Medication administration barcoding that will interface with the MAR and provide positive patient identification and documentation when giving medications.

Both of these technologies will provide challenges as we learn to use them. We will need to be open to changing our processes but they will both help improve staffing and patient care.

It is critical as we move forward that we have open, honest conversation so that we can improve the environment together.

Final word: Putting it in perspective

We cannot change the reality in which we exist—labor pressures, financial pressures and high patient and family expectations will continue to exist. We are aware that healthcare has entered a new age of complexity. Patients are older and sicker than they were 30 years ago. Patients take more medications and have more treatments and procedures. The technology used to care for these patients, whether clinical (smart pumps for example) or informational (the EMR) is complex and requires expert focus to maximize benefits and provide safe care. There are rising expectations for healthcare and caregivers from the public’s standpoint. There is a call for transparency of results on key quality, safety and satisfaction variables. These publically reported results are compared against all other providers and are considered measures of hospital quality. While the focus on quality and value escalates, so too does the emphasis on lowering the costs of health care. American healthcare is the most expensive healthcare in the world. However our overall health, our access to healthcare and the cost of our healthcare falls

short of the “best in the world”. Healthcare reform is about more access and lower healthcare costs. As Medicare, Medicaid and other payers lower reimbursement, hospitals and health systems are left with the need to deliver higher quality care with fewer resources.

Against this backdrop a team of staff nurses, nurse leaders and other disciplines began work in 2010 to examine how our organization should respond to providing quality care across the continuum. From this initial work came the Transitional Care Division, started in 2012. The Model of Care Redesign team began in 2011 with the specific goal to focus on improving inpatient outcomes while reducing the cost of delivering care. The result of this work included adding master’s prepared nurses in a navigator role on our units while adjusting our workloads to reduce overall labor costs. We believed that the nurse navigator, paired with a social work partner, would mitigate the impact of a slightly higher ratio of patients to nurses.

Now, as we embark upon refinements to our strategies to date, let’s remember two things. First, this is not new work. This is part of our continuous drive to excellence in a changing environment. Second, let’s remember that we are not alone in this work – and by working together, we will do the right things.

Together, we are Changing Health Care for Good.

Appendix K- Excerpt from communication

To: Nurse executives and hospital presidents
From: Chief operating officer and chief nursing officer
Regarding: Actions taken as a result of the evaluation of model of care metrics and feedback from nurses

Top of License

We want our nurses to work at the “top of their license”. We agree that this will be our primary focus. It’s not to say you can never add RNs back into the mix but it will need to be the exception, not the rule. Our strategic and financial focus will be on supporting the RN model we have now to help them work at top of license. To that end we will evaluate the tactics in the Advisory Board publication and either confirm implementation or look at next steps for evaluation or implementation.

Ancillary Care Providers (ACPs)

We agree that a key strategy to help with the intensity of work on the units is the addition of qualified, motivated ACPs. We struggle now with hiring ACPs and have ~40 open positions. Current *budgeted* ratios for ACPs run 1:10-1:12. We would like to move the ACP ratio in general to 1:8 with the following conditions taken into consideration:

- (a) The level of patient care or activity on the unit warrants this. We might have units where the physical care is so burdensome we would have an even lower ACP ratio and a unit where we would have a higher ratio. We might not need ACP ratios of 1:8 at nights unless it is a unit with high 24 hour physical care demands. This requires discernment

unit by unit. Just because we received financing for a 1:8 ratio does not mean we indiscriminately use it.

- (b) If we know there are units right now that need the increased ratio (several mentioned in our meeting) we can go ahead and hire prior to year end assuming we have the right candidates.
- (c) In addition we discussed the need to move the ACPs to the top of their scope and will quickly get together a team to look at hiring, orientation and laddering for ACPs. We are also going to examine providing shift differentials for ACPs as part of this effort and part of the market adjustment.

Navigators

We agree that the navigator role, focused on care coordination and meeting quality and satisfaction outcomes, is an appropriate role for our medical-surgical units where the ratio is budgeted at 6:1. Navigators should not have more than one unit (there would have to be an extenuating circumstance that we would agree negated this commitment). Any medical surgical units that are sharing navigators, we will move forward hiring navigators.

References

- American Association of Colleges of Nursing. (2007). *White paper on the education and role of clinical nurse leaders*. White Paper. Retrieved November 22, 2012, from aacn.nche.edu:
<http://www.aacn.nche.edu/publications/white-papers/ClinicalNurseLeader.pdf>
- American Association of Colleges of Nursing. (2013). 10 Questions with John Rowe. *Syllabus*, 39(5), p. 4. Retrieved October 8, 2013, from
<http://www.aacn.nche.edu/publications/SepOct13.pdf>
- Berkow, S., Stewart, J., & Virkstis, K. (2013). *Achieving top-of-license nursing practice*. Washington, DC: The Advisory Board Company.
- Bern, H., Maggi, J., Nierman, D., Rolnitzky, L., Bell, D., Rennert, R., . . . Vladek, B. (2010, October). High cost of stage IV pressure ulcers. *American Journal of Surgery*, 200(4), 473-477. doi:10:1016/amjsurg.2009.12021
- Brennan, C. W., Daly, B. J., & Jones, K. R. (2013). State of the science: The relationship between nurse staffing and patient outcomes. *Western Journal of Nursing Research*, 35(6), 760-794. doi:10.1177/0193945913476577
- Butler, M., Collins, R., Drennan, J., Halligan, P., O'Mathuna, D., Schultz, T., . . . E, V. (2011). Hospital nurse staffing models and patient and staff-related outcomes. *Systematic Review*(7). Cochrane Database of Systematic Reviews.
doi:10.1002/14651858.CD007019.pub2

Case, M. (2011). Oncology nurse navigator: ensure safe passage. *Clinical Journal of Oncology Nursing*, 15(1), 33-40. doi:10.1188/11.CJON.33-40

Clinical Advisory Board. (2010). *Preventing unnecessary readmissions*. Washington, DC: The Advisory Board. Retrieved November 25, 2012, from www.advisory.com/research/clinical-advisory-board/studies/2010/preventing-unnecessary-readmissions/essay-readmissions-in-the-national-spotlight

Fontana, E. (2012). Medicare payment strategy. *The Advisory Board* (pp. 1-29). Washington, DC: The Advisory Board. Retrieved November 26, 2012, from www.advisory.com/research/health-care-advisory-board/events/webconference/2012/medicare-payment-strategy

Forster, A., Clark, H., Menard, A., Dupuis, N., Chernish, R., Chandok, N., . . . vanWalraven, C. (2005, October). Effect of a nurse team coordinator on outcomes for hospitalized medicine patients. *The American Journal of Medicine*, 118(10), 1148-1153. doi:10.1016/j.amjmed.2005.04.019

HCAHPS: patients' perspectives of care survey. (2013). Retrieved from <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalHCAHPS.html>

Hospital value based purchasing. (2013). Retrieved from Medicare.gov-Hospital Compare: <http://www.medicare.gov/hospitalcompare/data/hospital-vbp.html>

Hospital-acquired conditions. (2012). Retrieved from http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Hospital-Acquired_Conditions.html

- Institute of Medicine. (1999). *To Err is Human: Building a Safer Health System*. Washington, DC: National Academies Press. Retrieved November 15, 2012, from www.nap.edu/catalog/9728.html
- Institute of Medicine. (2001). *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: The National Adademies Press. Retrieved November 15, 2012, from www.nap.edu/catalog/10027.html
- Institute of Medicine. (2012). *Best Care at Lower Costs: The Path to Continuously Learning Health Care in America*. Washington, DC: The National Academies Press. Retrieved November 25, 2012, from nap.edu/cart/download.cgi?&record_id=13444&free=1
- International Council of Nurses. (2006). *The Global Nursing Shortage: Priority Areas for Intervention (A Report from the ICN/FNIF)*. Geneva, Switzerland: International Council of Nurses. Retrieved November 20, 2012, from http://www.icn.ch/images/stories/documents/publications/GNRI/The_Global_Nursing_Shortage-Priority_Areas_for_Intervention.pdf
- Kimball, B., Joynt, J., Cherner, D., & O'Neil, E. (2007). The quest for new innovative care delivery models. *The Journal of Nursing Administration*, 37(9), 392-398. doi:10.1097/01.NNA.0000285142.57118.56
- McHugh, M., Berez, J., & Small, D. (2013). Hospitals with higher nurse staffing had lower odds of readmissions penalties than hospitals with lower staffing. *Health Affairs*, 32(10), 1740-1747. doi:10.1377/hlthaff.2013.0613

Medicare Learning Network. (2009). *Acute Inpatient Prospective Payment System*. Retrieved October 13, 2013, from cms.gov: <http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/AcutePaymtSysfctsht.pdf>

Melnyk, B. M., & Fineout-Overholt, E. (2011). *Evidence-Based Practice in Nursing and Healthcare* (Vol. second edition). Philadelphia, PA: Wolters Kluwer-Lippincott Williams & Wilkins.

Nash, J. (2010). *Why hospitals should fly: The ultimate flight plan to patient safety and quality care*. (L. Reeder, & J. Byrnes, Eds.) Bozeman, MT, USA: Second River Healthcare Press.

National Database of Nursing Quality Indicators. (2010). *Guidelines for Data Collection on the American Nurses Association's National Quality Forum Endorsed Measures*. School Of Nursing . Kansas City, KS: University of Kansas. Retrieved August 15, 2013, from www.odh.ohio.gov/~media/ODH...nursestaffingmaterials8-2-2010.ashx

Naylor, M., Aiken, L., Kurtzman, E., Olds, D., & Hirschman, K. (2011). The importance of transitional care in achieving health reform. *Health Affairs*, *30*(4), 746-754. doi:10.1377/hlthaff.2011.0041

Nosbusch, J., Weiss, M., & Bobay, K. (2010). An integrated review of the literature on challenges confronting the acute care staff nurse in discharge planning. *Journal of Clinical Nursing*, *20*, 754-774. doi:10.1111/j.1365-2702.2010.03257.x

- Nursing Executive Center. (2009). *The Business Case for Investment in Nursing*. Washington, DC: The Advisory Board. Retrieved November 23, 2012, from www.advisory.com/research/nursing-executive-center/studies/2009/the-business-case-for-investment-in-nursing/care-quality
- Nursing-Sensitive Indicators. (2013). Retrieved from http://www.nursingworld.org/MainMenuCategories/ThePracticeofProfessionalNursing/PatientSafetyQuality/Research-Measurement/The-National-Database/Nursing-Sensitive-Indicators_1
- Ott, K., Haddock, S., Fox, S., Shinn, J., Walters, S., Hardin, J., . . . Harris, J. (2009). The clinical nurse leader: Impact on practice outcomes in the Veterans Health Administration. *Nursing Economics*, 27(6), 363-383. Retrieved from <http://www.nursingeconomics.net/cgi-bin/WebObjects/NECJournal.woa>
- Patterson, J. (2011). The effects of nurse to patient ratios. (J. Middleton, Ed.) *Nursing Times*, 107(2), 22-25. Retrieved November 2012, from <http://www.nursingtimes.net/>
<http://www.nursingtimes.net/>
- Porter-O'Grady, T., Clark, J., & Wiggins, M. (2010). The case for clinical nurse leaders: Guiding nursing practice into the 21st Century. *Nurse Leader*, 8(1), 37-41.
doi:10.1016/j.mnl.2009.11.002
- Rogers, L. (2006). Meeting the Center for Medicare & Medicaid Services requirements for quality assessment and performance improvement-A model for hospitals. *Journal of Nursing Care Quality*, 21(4), 325-330. Retrieved October 6, 2013, from <http://www.ncbi.nlm.nih.gov/pubmed/16985402>

- Spryszak, L. (2010). *What does case-mix index mean to you?* Retrieved October 15, 2013, from HC Pro: <http://www.hcpro.com/HOM-250674-5728/What-does-casemix-index-mean-to-you.html>
- Stanley, J., Gannon, J., Gabuat, J., Hartranft, S., Adams, N., Mayes, C., . . . Burch, D. (2008). The clinical nurse leader: a catalyst for improving quality and patient safety. *Journal of Nursing Management*, *16*, 614-622. doi:10.1111/j.1365-2834-2008.00899.x
- The Joint Commission. (2012). *2012 National Patient Safety Goals*. Retrieved November 25, 2012, from www.jointcommission.org:
www.jointcommission.org/assets/1/18/2012_NPSG_Presentation_-_final_2-03-121
- The Joint Commission. (2013, January). *Comprehensive Accreditation Manual for Hospitals*. Chicago, IL: The Joint Commission.
- The World Health Organization. (2009). *World Health Statistics*. The World Health Organization. Geneva, Switzerland: WHO Press. Retrieved November 24, 2012, from www.who.int/whosis/whostat/EN_WHS09_Full.pdf
- Weeks, K., Goeschel, C., Cosgrove, S., Romig, M., & Berenholtz, S. (2011). Prevention of central-line associated blood stream infections: A journey toward eliminating preventable harm. *Current Infectious Disease Reports*, *13*(4), 343-349. doi:10.1007/s11908-011-0186-8

Vita

Diane Smith Raines is a native of _____ and has lived in Jacksonville, Florida with her husband and two sons for over 30 years. She earned her Bachelor of Science in Nursing from Florida State University (1976), and her Masters of Science in Nursing from the University of Florida (1983), with an emphasis on adult cardiovascular health. Currently, she has completed the requirements for the Doctor of Nursing Practice degree from the University of North Florida in Jacksonville, FL.

Ms. Raines serves as the senior vice president and chief nursing officer of a multi-hospital health system that has been twice designated as a Magnet health system. Her prior experience includes clinical roles in cardiovascular intensive care and cardiac rehabilitation, administrative roles in cardiac services, education and leadership development, business development, marketing and public relations and human resources. She has served as the nurse executive for the flagship hospital, a community hospital and a children's hospital in the health system in which she works.

Ms. Raines is certified by the American Nurses Credentialing Center as a nurse executive-advanced. She is a Johnson & Johnson Wharton Executive Fellow and has completed the AHA fellowship in healthier communities. Ms. Raines completed Leadership Jacksonville in 2002. She is a member of the Lambda Rho and Beta Pi chapters of Sigma Theta Tau International Honor Society. She also holds membership in the Southern Nursing Research Society, the American Nurses Association, Florida Nurses Association and American Organization of Nurse Executives.

Publications include:

Erickson, J. M., & Raines, D. S. (2011). Expanding an Academic–Practice Partnership. *Journal of Professional Nursing*, 27(6), e71-e75.

Raines, D., McCartt, P., & Turner, P. (2011). CaritasHeartMath™ in the Emergency Department Setting: The Impact of Self-Care. *Measuring Caring: International Research on Caritas as Healing*, 269.