Impact of Nurse Residency Program on Transition to Specialty Practice

by

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Impact of Nurse Residency Program on Transition to Specialty Practice

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Abstract

While academic nursing programs teach the concepts and theory of providing care, these programs cannot provide sufficient experiential learning to prepare the nurse for all that might be faced in diverse clinical practice settings. As a result, each nurse faces transition to practice hardships with the first nursing role and again each time the clinical setting changes. The Specialty Nurse Residency intervention offers support and instruction during the crucial transition period. Efficacy of the intervention is evaluated based on data analysis from pre and post-intervention survey responses. This quantitative, descriptive study solicits feedback from experienced staff to answer the question: Are the positive outcomes of the Specialty Nurse Residency program reproducible in specialty units other than the Burn ICU as evidenced by preceptor, manager and educator feedback before and after program implementation? The intervention engages new-to-specialty nurses within an evidence-based support system that validates competence and development of clinical reasoning skills. Preceptor development and support are key elements of intervention and program delivery, as these crucial staff members safeguard program and learner success.

Keywords: residency, transition, internship, preceptor, apprenticeship

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CHAPTER 1: INTRODUCTION

The discipline of nursing demands that direct care providers be knowledgeable, flexible, adaptable, and have well developed critical thinking and clinical judgment skills. The competence and clinical reasoning of direct care providers can make a life or death difference in the care of patients who are unstable, critically ill, or potentially fragile. These descriptors are appropriate for nearly all patients presenting in acute care settings.

The diversity of healthcare settings, environments, and specialties means that academic programs can teach the concepts and theory of providing care, but cannot provide sufficient experiential learning to acclimate the new graduate or new-to-specialty nurse to all that they might face in clinical practice. This experiential learning must occur within the context of patient care, thus each nurse faces transition to practice hardships with the first nursing role and each time a new specialty practice setting is encountered. In most healthcare settings, this transition is supported through the use of preceptors, although there are no standards of practice for selecting, preparing or engaging nurse preceptors (Haggerty, Holloway, & Wilson, 2012).

This project evaluates the efficacy of a Specialty Nurse Residency Program (SNR) based on data analysis from preceptor and educator survey responses pre and post-program implementation as compared with survey responses from a control group comprised of specialty units within the same agency that are not using the SNR program. The SNR is an evidence-based transition to practice framework that is delivered by preceptors who are fluent in the roles of clinical teachers, evaluators, and protectors. Expected outcomes include advanced preceptor support for learning in the clinical environment, as well as the preceptor and educator evaluative feedback on the support for learning and competency development provided by the Clinical Transition Framework (CTF) as used for a specialty practice residency program (VNIP, 2016).

Educator or preceptor supervision is essential for ensuring effective patient care and new care provider competency requirements (Harper, 2009; Windsor, Douglas, & Harvey, 2012). Competency in clinical care includes clinical reasoning, judgment, and interpersonal skills as well as technical performance capability (Wilkinson, 2013). Data collection for competence assessment must address aspects of critical thinking, human caring relationships, leadership, and knowledge integration as well as technical and safety skills.

Problem Statement

The problem being addressed in this study is that new nurse graduates and nurses that are new to specialty care units are not ready and prepared to meet the expectations inherent within the specialty role. The diversity of healthcare settings, environments and specialties creates a massive volume of concepts, theory, and specialty unique knowledge for the apprentice nurse to comprehend. The apprentice is unable to anticipate the needs of an unstable patient due to multiplicity of problems presenting in a single patient and lack of experience with the type, complexity, and unique problems that are inherent to the specialty setting. Experiential and reflective learning is required before unique knowledge and various theory concepts can be integrated into varied and dynamic practice experiences (Benner, Sutphen, Leonard, Day, & Shulman, 2010). While simulation adds to reflective learning, experiential learning must occur within the context of patient care, thus each nurse faces ‘transition to practice’ with the first nursing role and when changing specialties (Cheung & Noel, 2014).

Through this quantitative, descriptive, quasi-experimental study, the investigator will evaluate the efficacy of a Specialty Nurse Residency Program (SNR) based on data analysis from preceptor and educator survey responses pre and post-program implementation, as compared to the responses from the control group of non-participating specialty units within the same facility.

The SNR is a clinical transition model that was proven effective in the Burn Intensive Care Unit (ICU) at the same medical center as planned for this Capstone Project. The SNR study solicits evidence from preceptors and educators that pertains to the impact of preceptor support, structured clinical coaching plans, and the SNR framework on specialty knowledge, skills, competency, and clinical reasoning.

Background

The need for initial transition to practice programs for nurses is well documented. Nurse leaders and researchers from across the country are recommending nurse residency programs and many healthcare agencies have implemented pilot projects or ongoing residency programs for new graduate transition to practice (Benner, Sutphen, Leonard, Day, & Shulman, 2010; Caramanica & Feldman, 2010; ISNA, 2011; CCV, 2012). There is less documentation quantifying the need for specialty care transition programs, but many specialties have consistently offered coursework and clinical preceptorships for transition into the specialty's domain of practice (Dracup, 2007; Hall & Marshall, 2006; Welding, 2011). Specialties that include significantly unique practice functions such as home care, intensive care, psychiatric, oncology, operating, and delivery rooms have demonstrated the impact and benefits of providing a specialty nurse residency or internship (Foley, 2013; Zinn, Guglielmi, Davis, & Moses, 2012). Regretably, there is no outline of standard program components nor a validated tool for evaluating program effectiveness (Anderson, Hair, & Todero, 2012).

When coursework is needed that teaches the nurse how to apply specialty nursing skills and judgement that is unique to a domain of practice, the course model goes beyond orientation and into specialty instruction that builds upon basic academic development (Crider & McNiesh, 2011; Delfino, Williams, Wegener, & Homel, 2014; Zinn, Guglielmi, Davis, & Moses, 2012).

The diversity of healthcare settings, environments and specialties creates a massive volume of concepts, theory, and specialty unique knowledge for the apprentice nurse to synthesize and comprehend. Clinical time and specialty practice opportunities are limited for nursing students by the academic year, curriculum concentration, and available practice sites, thus specialty practice knowledge and skills are developed after engagement in the specialty position.

Instructional content is best learned and retained if the opportunity for application occurs synergistically with the specialty knowledge content delivery (Benner, Sutphen, Leonard, Day, & Shulman, 2010). The clinical practice offered in connection with a specialty course provides opportunity for reflective learning within clinical work (Dean, Sykes, Agostinho, & Clements, 2012). While experienced nurses bring critical thinking and work organization skills with them, reflection is a necessary component of developing clinical reasoning and judgment that is unique to a new specialty practice setting (Sorensen & Yankech, 2008). These crucial nursing skills are a vital component of care for unstable or potentially fragile patients.

Duchscher (2012) coined the term *Transition Shock* © to encompass the new nurse's entry into practice. This difficult transition process occurs during the first one to three months of practice, after completing orientation. Duchscher's work is built upon Marlene Kramer's work from the 1960s wherein the focus on transition was pioneered with the text, *Reality Shock: Why Nurses Leave Nursing* (Kramer, 1974). The transtion shock model identifies two critical challenges for the new nursing professional. First, is that the practice of professional nursing is not as simple as application of theory and concepts to clinical events as they were outlined within the text. Experiential learning is required before novice nurses learn how to integrate the theory into varied and dynamic practice experiences. Second, the transition adjustment is more than a theory-practice gap. The transition causes the complete individual to be involved in the change

process. The progression includes the intellectual, physical, social, cultural, generational, personal, spiritual, economic and emotional self.

The phenomenon of transition to practice is experienced by both new graduate nurses and those changing specialty practice setting. In most healthcare settings, this transition is supported through the use of preceptors, although there are no standards of practice for selecting or preparing nurse preceptors, especially once the novice nurse is licensed and practicing in the clinical setting. Transition of new graduates has changed with time and the increased fiscal constraints on healthcare agencies. Senior leadership often expects the new graduate or new-to-specialty nurse to be ready to practice at a proficient level without the agency needing to invest in their development.

Clinically-based learning has become difficult to provide within health care professional curricula and this is especially true within nursing programs (Daly, et al., 2013). Studies are needed that quantify both the impact and composition of transition programs. The nursing profession would benefit from an established set of model requirements and comparative evaluation tools for program delivery and assessment. Within the transition process, Benner's three high-end apprenticeships can make a significant difference in development as a professional nurse and provide the foundation for specialty practice development (Benner, Sutphen, Leonard, Day, & Shulman, 2010). The model is synergistic with specialty care learning, transition, and clinical reasoning skill development (Crider & McNiesh, 2011).

The report, *Recommendations of the VT Blue Ribbon Commission on Nursing* (CCV, 2012) specifically refers to the VNIP internship framework as an evidence-based model that is used extensively in a variety of settings. With 15 years of internship delivery experience, VNIP has confirmed that there are three distinct levels of internship or residency program needed

(VNIP, 2012). Initially, there is a need for undergraduate internships that assist students in learning foundational skills and knowledge within the context of clinical practice. The second level targets new graduates transitioning into the first nursing role. In the third level, each nurse requires another didactic and experiential learning program when transtioning to a new specialty (Hall & Marshall, 2006; Shur, 2011). The proposed implementation project targets the needs of the third level of internship, that of transition to a new specialty practice domain. The target audience for the SNR will be a combination of new graduates and nurses with prior experience, but new to the selected realm of practice. Data collection from educators, colleagues, and managers targets assessment of the support systems, resources, structure, and outcomes of the framework for developing and evaluates the capability of system in developing the apprentices.

Many specialties such as home care, pediatrics, neonatal care, intensive care, psychiatric, oncology, operating, and labor/delivery rooms have offered coursework and clinical preceptorships for transition into the domain of practice (Delfino, Williams, Wegener, & Homel, 2014; Dracup, 2007; Foley, 2013; Hall & Marshall, 2006; Welding, 2011). Regretably, acute care educators often call these programs by the title of *orientation* and the title is misleading. True orientation is the transition program that is offered to staff coming with experience in that specialty area. With the title of orientation, the program is an expectation of providing the business of healthcare and does not qualify for grant funding or other academic support. Orientation consists of guidance about what is unique to the specific healthcare agency, its policies, and the specific equipment used there.

When coursework is needed that teaches the nurse how to apply specialty nursing skills and judgement unique to a domain of practice, the model goes beyond orientation and into specialty instruction that builds upon basic academic development (Delfino, Williams, Wegener,

& Homel, 2014; Zinn, Guglielmi, Davis, & Moses, 2012). The clinical practice offered in connection with this type of specialty course provides opportunity for reflective learning within clinical work (Dean, Sykes, Agostinho, & Clements, 2012). Reflection is a necessary component of developing clinical reasoning and judgment skills (Benner, Sutphen, Leonard, Day, & Shulman, 2010). Using nurse residency programs for transition to practice has been shown effective for development of nursing knowledge, skills, and reasoning. The programs achieve cost savings through retention, satisfaction with workplace culture and reduced orientation time (Dyess & Sherman, 2009; Goode, Lynn, Kresk, & Bednash, 2009; Hawkins, 2012).

A recurring theme within the literature and research is the impact of preceptors on the satisfaction and development of the novice nurse (Covelli, 2012; Ford & Fitzgerald, 2013; Haggerty, Holloway, & Wilson, 2012). This is especially true when we teach preceptors how to foster critical thinking devleopment (Cotter, 2010; Forneris & Peden-McAlpine, 2009; Goss, 2015; Mann-Salinas, et al., 2014; Sorensen & Yankech, 2008). Preceptors are crucial clinical staff members that offer guidance, coaching and instruction in the clinical setting while ensuring that the clinical care provided for patients is safe and effective. The preceptor instruction used in this project is based in the framework and resources developed by the non-profit organization, VNIP (2012), via a network of education professionals.

The apprentice nurses are those newly hired to the specialty practice domain, whether they are new graduates or experienced nurses that are ‘new-to-specialty‘. A framework for knowledge, skills, and judgment development will support the apprentice as they transition towards competence within the specialty setting. Clinical preceptors support the experiential learning of the apprentice while they ensure safe, effective patient care. The coaching plans are a written guideline for clinical learning strategies and will be used by the preceptor to frame the

competency development process. The preceptor support system makes preceptor feedback pertaining to program delivery and efficacy vitally important.

The preceptor training and support is constant between specialties and different service areas, but specialized clinical coaching plans may be needed for some practice settings. Support and instuction from the preceptor impacts the development of clinical skills and judgment in a step-by-step process. If nurse preceptors are to develop the novice nurses' thinking, reasoning, and judgement skills, the preceptor's ability to foster the development of these skills in others must be established through evidence-based, preceptor education (Benner, Sutphen, Leonard, Day, & Shulman, 2010; Cotter, 2010; Goss, 2015; Mann-Salinas, et al., 2014). The preceptor support system makes preceptor feedback pertaining to program delivery and efficacy vitally important.

Integration of Clinical Coaching Plans

Clinical Coaching plans evolved within the original VNIP Internship framework as a component of support and guidance for the preceptor/apprentice team (VNIP, 2012). Each coaching plan is a single page, written guideline that identifies the nursing goal statement, specific performance criteria, instructional or learning strategies, and an activity for reflective learning or critical thinking development. The coaching plans were a significant element in the successful pilot project at the US Army burn unit preceptorship at San Antonio Military Medical Center (Robbins, 2014). The Clinical Transition Framework offers over 150 coaching plans and a template for designing more. The faculty and partners working within the framework have developed coaching plans for specialties that include home care, oncology, burn care, emergency department, work organization skill development, and clinic nursing; as well as various medical and surgical specialties.

Coaching plan design and development is usually beyond the core skill set of clinical care providers, but the proficient nurse preceptor can contribute the essential training and performance criteria that support learner development and assessment. The workload of the preceptorship team is eased by having the educator format the specialized content into a standardized coaching plan. The finished product, a specialized coaching plan, guides the more novice preceptors in the support and deliberate practice that is needed by the learner.

The concept behind these tools provides a resource manual of standardized clinical coaching plans, just as there are many texts of nursing care plans. When placed in use, each plan is customized for the apprentice nurse and the unit within which care is provided. One of the most important components of the coaching plans is the provision of concrete, specific activities that foster the development of critical thinking and clinical judgment. Preceptor and new graduates have cited this activity as one of the most important aspects of clinical development within a residency framework (Watters, 2009). The coaching plans support experiential learning and delivery of the three high-end apprenticeships as called for within the transformation of nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010). The plans can be general, with a focus on workload management, or address an aspect of patient care that is unique to the specialty practice (Crider & McNiesh, 2011; Robbins, 2014). A crucial concept within the coaching plans is concrete, concise, specific development of the thinking and reasoning skills that are unique to the specialty knowledge base and care skills.

Purpose

The purpose of the quantitative, descriptive, implementation study is to evaluate the efficacy of a clinical transition framework as applied to competency development within a new specialty area. Preceptor and educator survey responses are analyzed pre and post-program

implementation, as compared to the control group responses of non-participating specialty units within the same facility. The study adds to the outcomes data reported for the Burn ICU study and may lead to conclusions on possible reproduction of the SNR implementation outcomes in other settings. The SNR is an evidence-based transition to practice framework for specialty care units as delivered by preceptors that are fluent in their role as clinical teachers, evaluators, and protectors (VNIP, 2012). Program structure and components are based upon Benner's (2004) theory and integrates concepts from her more recent appeal for a radical transformation in nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010). In applying the Dreyfus model to nursing, Benner identified that nurses follow the same pattern for skills acquistion that Dreyfus postulated many years prior (Benner, 2004). The nurse is required to use logic of reasoning within situations in transition to recognize and track clinical changes in the patient as time progresses. This is a learned skill and requires deliberate practice with a knowledgeable guide to ensure safety and accuracy. Experiential, situational learning lies at the heart of sound clinical wisdom and clinical judgment. Out of this clinical judgment come the nursing decisions that intervene for safe and effective patient care in complex situations.

This implementation project will include standardized, evidence-based preceptor instruction, clinical competencies based on the Competence Outcomes Performance Assessment (COPA) model, coaching plans that provide guidance for the preceptor/apprentice team in the clinical setting, and a single step in program effectiveness evaluation. The framework uses both tools and process to provide a systematic support structure for both the apprentice and preceptor. Expected outcomes include advanced preceptor and coaching support for clinical learning, as well as evaluative feedback on the competency development and support for learning provided by the SNR (Wilkinson, 2013). The project components comprise a model for transition to

specialty care settings that can be adapted to other practice settings within a networked medical system, if program outcomes determine that the SNR framework can be reproduced in other specialty care areas.

Providing an internship or residency program for new nurses can be an expensive proposition for healthcare agencies. The SNR must show significant potential for reduction in errors, redundancy or costs if it is to be adopted for broad-based utilization (Gough & Cameron, 2012). Previous studies based on the foundations of the evidence-based preceptorship model revealed improved retention and satisfaction, as well as a reported decrease in overall cost of orientation for new graduate hires (Hawkins, 2012; Robbins, 2014). Hawkins also reported a decreased reporting of errors or 'near misses' on the part of the new graduates as compared with a control group. Nurse residency programs were also found to enhance clinical leadership skills and evidence-based practice (Caramanica & Feldman, 2010: Dyess & Parker, 2012).

Relationship of Issue to Executive Leadership Challenges

Internships, residencies, preceptor development, and orientation of new staff all occur at some expense to the agency, making the process a crucial leadership issue when determining both budgets and utilization of clinical staff. These programs have a positive impact on patient safety but require commitment and investment from nursing leadership (Dracup, 2007). The programs also impact the recruitment and retention of nurses.

Hawkin's (2012) study reported a significant positive impact on patient safety and decreased fiscal investment when an evidence-based preceptor course was added to each participating agency's 'on-boarding' program. When the preceptor model and newly developed coaching plans were used for a burn intensive care unit, Robbins (2014, p, 4) reported a 50% decrease in staff turnover and increased staff satisfaction overall. Nursing turnover comes at an

expense to both the agency and to patient care. Loss of the experienced nurse not only leaves a gap in available staff to provide care, but also a gap in qualified staff who might precept new hires needing orientation or specialty practice development.

Significance of the Study

To implement nursing science within the direct care of patients, nursing preparation for clinical practice must include a focused nurse internship or residency program each time the nurse transitions to a new specialty care area. This is particularly crucial in care areas where patients are critically unstable, such as intensive care units and the emergency department, but is equally true for all practice specialties (Welding, 2011; Shur, 2011). A best practice model for transition to practice in specialty care is needed for ensuring effective preparation for clinical practice in each nursing practice domain. The SNR is an evidence-based transition to practice framework for specialty care units that is based upon Benner's (2004) theory and integrates concepts from her more recent appeal for a radical transformation in nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010). This includes concepts of the three high level apprenticeships for knowledge integration, application of skilled know-how, and ethical comportment and formation as a professional nurse.

This project may take the nursing profession a step closer to identifying crucial components needed within a transition to practice program. The intervention will focus on the preparation and role of preceptors, along with the tools and resources provided to these crucial professionals for supporting both the development and competence assessment of nurse residents or apprentices. The effectiveness of this framework was proven through an evaluation project in the Burn ICU at an Army medical center. The structure and tools will now be evaluated for efficacy in other specialty areas. If the outcomes are reproducible in other nursing service areas,

the framework could potentially universalize the approach to transition programs within the significant healthcare system hosting this project.

Clinical coaching plans have the potential to ease the workload of preceptors while delivering specific learning and competency assessment guides to the NR. The plans are tools that support knowledge base growth, skills development, deliberate practice, reflective learning, and documentation of residency progression. The coaching plans provide a concrete communication tool that travels with the apprentice and conveys learning needs and competencies to the preceptors, managers, and educators.

Feedback is solicited on the influence of coaching plans, as a distinctive guide for the work and learning of the novice nurse. While improving the process for transition, coaching plans can standardize our approach to transitional support, just as standardized nursing care plans provide a template for specific care issues faced by nurses. Having a standardized coaching plan template allows the preceptor to individualize the plan for the needs of the novice, while not having to create a teaching plan from scratch. The VNIP collaborative network of educators has developed an extensive set of coaching plans for a variety of specialties. The standardized plans can be used with new hires in the same manner that standardized nursing care plans have been used in planning optimal patient care. Coaching plans save time for the preceptor, while providing clearly defined expectations within tools that are based on professional development concepts.

The Nature of the Project

Implementation of science within nursing care starts with the educational process of preparing nurses academically and continues with transition to practice development and the support systems found in the clinical setting. This implementation project will use a specialty-

specific nurse residency framework to support transition to practice for both new graduate and new-to-specialty nurses (VNIP, 2012). A validated survey tool (Appendix A) is integrated within the plan for program delivery to track and assess the perceptions of competence development and impact of the model on the apprentice nurse, workplace culture, and support systems.

Systems and support within the healthcare workplace provide the foundation for safe and effective care for patients in all settings. This implementation project will employ an evidence-based transition to practice framework for specialty care units as delivered by preceptors that are fluent in their role as clinical teachers, evaluators, and protectors (VNIP, 2012). The SNR is an evidence-based framework founded on Benner's (2004) skills acquisition theory and her more recent appeal for a radical transformation in nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010).

The study methodology is based upon current literature related to the delivery and assessment of internships, residencies, and preceptor programs (Anderson, Hair, & Todero, 2012; Cappel, Hoak, & Karo, 2013; Goss, 2015; Mann-Salinas, et al., 2014). Quantitative data is preferred, due to the need to engage senior leadership in financing the progams. Nurse leaders will seek measurable outcomes that include fiscal impact such as specific retention and safety data (Hawkins, 2012; Robbins, 2014). Expanding on the data collected by Robbins, Hawkins, and others adds credibility to the possibility of the Burn unit outcomes being reproducable in other specialty care areas.

Lenburg (2010) provides crucial guidelines and examples for writing performance criteria and for utilizing the COPA competency framework. Within the COPA model, performance criteria statements assist the apprentice, preceptor, educator, and manager in determining what

instruction, resources, reading, or experiential learning is required to achieve the expected outcomes. The proposed project solicits evidence from preceptors that pertains to the impact of preceptor support systems and structured clinical coaching plans on knowledge, skills, competency, and reasoning development of the apprentice.

The apprentice is a nurse new to the specialty practice domain, whether they are new graduates or experienced nurses that are new-to-specialty. The residents are supported by a framework for knowledge and skills development which is delivered via preceptor and educator support systems. The coaching plans are a written guideline for clinical instruction and support and are used by the preceptor to support the competency development and documentation process. Clinical preceptors will support the experiential learning of nurse residents. The preceptor support system makes preceptor feedback pertaining to the program vitally important.

Preceptors play a very significant role in program delivery. New-to-specialty nurses bring limited experience with transition programs, while the preceptors possess a wide pool of background knowledge pertaining to orientation, internships, and residencies. The number of preceptors and educators involved in the study will be much larger than the number of apprentices, thus providing a greater number of survey respondents. The planned data collection provides a 360 degree view of SNR program delivery from all experienced staff members that work with the framework and tools. The wider distribution and background experience of survey participants is expected to provide a stronger data pool for analysis.

Although written in broad language and developed by a statewide collaborative, the Workplace Survey tool was originally developed and validated to evaluate the VNIP transition program. The literature search found no other validated tool that focuses on residency program structure and components, making this tool a logical choice for this study. Most transition

program studies have collected data from the nurse residents and focused on knowledge development, critical thinking assessment, retention data, or self-effciacy. This project uses a unique approach to focus on the program structure as experienced by the crucial clinical teacher and competency evaluator, the preceptor and colleagues of the apprentice.

The literature does not identify the role of coaching or teaching plans within transition programs, thus this is a variable that requires further exploration. An added comments question on the tool will request feedback pertaining to coaching plans, thus providing a start for a Delphi study related to program components, tools, and evaluation. Dissemination of outcomes of a program that uses coaching plans is appropriate prior to inquiring about them as a significant program component, or not.

With use of the established tools and resources from the clinical transition framework, this project will develop preceptors through an evidence-based instructional program, customize the coaching plans to the specialty, and enroll new-to-specialty nurses in the Specialty Nurse Residency (SNR). Once enrolled, the apprentice will engage in experiential learning under the supervision of clinical preceptors. Preceptor, educator, and colleague feedback will be collected before and after program implementation and be compared to the control group responses of non-participating specialty units within the same facility. The data comparison is expected to assemble data pertaining to the efficacy of the SNR within the specialty domain. This will allow testing of the null hypothesis that there will be no significant difference in aggregate scores before vs. after, with either the intervention or the control groups. Study data will undergo quantitative, comparative, descriptive data analysis in preparation for outcomes reporting.

Research Question

The formula for developing the research question is based on the PICOT method as

outlined by Melnyk and Fineout-Overholt (2011). This approach hones the process for searching for evidence by clearly identifying the population**,** intervention, comparison, outcome, and timeframe (PICOT) that may be required to achieve the outcome. In this situation, the population targets other agency specialty units, for the intervention of the SNR, and will compare before and after survey results to determine whether the results from the Burn ICU are reproducible with other specialties within the agency. The PICOT question for this implementation project is: Are the outcomes of the Specialty Nurse Residency program (I) reproducible (O) in specialty units (P) other than the Burn ICU (Robbins, 2014), as evidenced by preceptor and educator feedback with comparison (C) of survey responses before and after (T) program implementation?

Theoretical Framework

The Specialty Nurse Residency framework is based upon the theoretical framework of Benner's skills acquisition theory and her more recent research related to transforming nursing education (Benner, 1984; Benner, Sutphen, Leonard, Day, & Shulman, 2010). In addition to the foundation of Benner's early work, the project will apply the concepts and approach that she espouses in, *Educating Nurses: A call for Radical Transformation* (Benner, Sutphen, Leonard, Day, & Shulman, 2010). Benner describes nursing practice as being much more complex as the years advance. The research and text speak to the need for a more situated clinical science, much like the conclusions of the Carnegie Study when researching the approach of transition into medical practice as a physician. The wide-ranging Carnegie Study determined that medical students need three apprenticeships (Irby, Cooke, & O'Brien, 2010). The apprentice would start with a cognitive framework that fosters the development of scientific knowledge, theory, and principles required for the specialty practice. Second, practice experience is needed that focuses

on clinical reasoning and know-how that is specific to the clinical setting. This know-how grows and develops over time and is tied with the context of actual patient care. Finally, Benner calls upon nursing to engage in an apprenticeship of formation and ethical comportment, wherein the nurse develops a personal professionalism and world view of nursing's role in healthcare delivery (Benner, Sutphen, Leonard, Day, & Shulman, 2010). The model that Benner, et al, call for has proven effective for specific specialty areas such as psychiactric nursing (Crider & McNiesh, 2011).

The conceptual framework for the COPA model shapes the competence assessment tools for the Clinical Transition Framework as used in the SNR (Lenburg, 2010; VNIP, 2016). The COPA model addresses both the development and assessment of competence in clinical practice. Benner's (1984) theory works synergistically with the COPA model to deliver a safe clinical learning experience that promotes an advanced level of nursing practice. The skills acquisition theory provides the foundational structure for experiential learning, with a focus on the three high-end apprenticeships as crucial components of nurse development. The apprenticeships address specialty knowledge, skilled know-how, professional formation, and ethical comportment that is specific to the challenges within the specialty domain. The coaching plans and preceptor process support the apprenticeships and track development of knowledge base, clinical proficiency and reasoning skills that are unique to the specialty setting.

The concepts and theory behind Benner's original and current work are a close fit with the approach used within the clinical transition framework as implemented for new graduate nurses. The natural fit adds to the evidence-base for nurse apprentice development as well. Concept-based instruction and the three apprenticeships are processes that develop clinical reasoning and judgment skills in the new–to-specialty nurse. This development starts with

Benner's support for transition from novice towards competent and merges with the reflective and experiential learning that the preceptor inspires within the clinical setting.

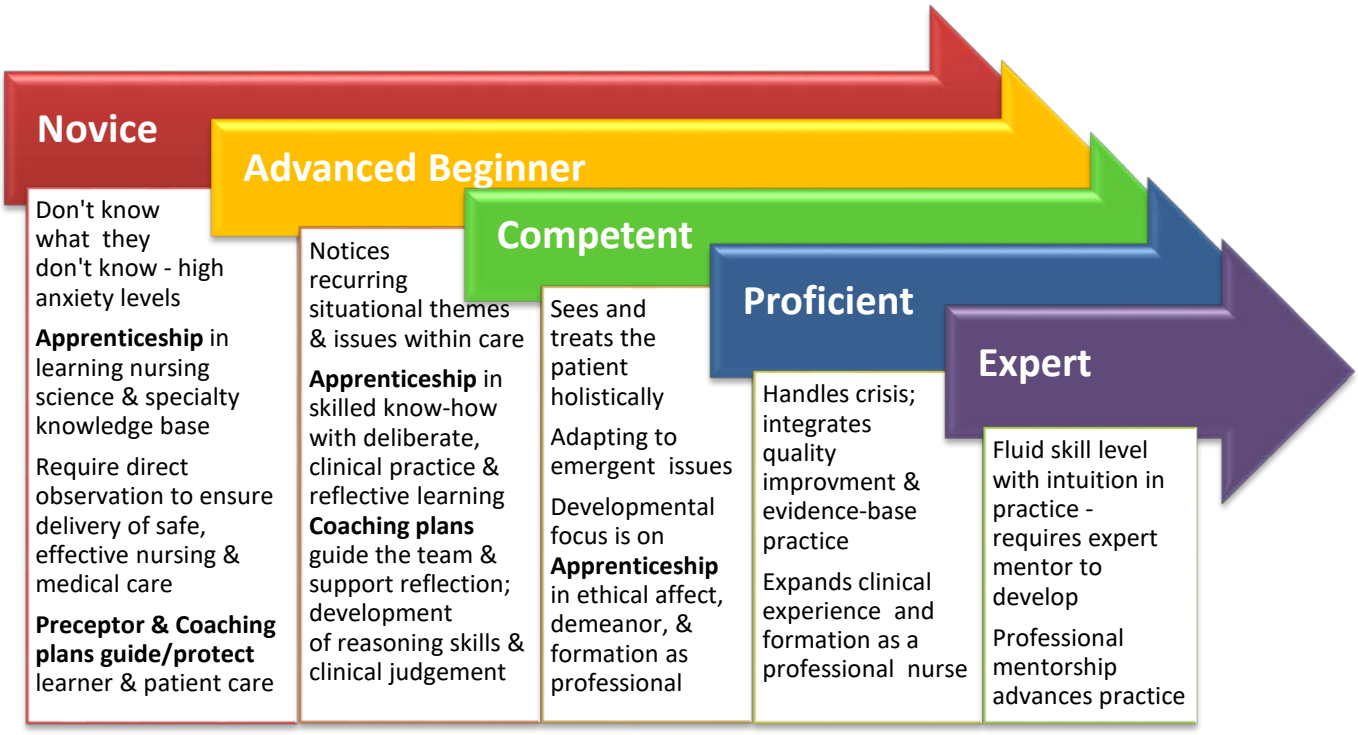

Figure 1. Integration of Skills Acquistion Theory with Three High End Apprenticeships

The COPA model framework creates a foundational structure for the three nursing apprenticeships as outlined within Figure 1. Learning nursing science and knowledge is based in both academic education and specialty practice courses completed within professional development. The preceptorship provides practical application of the knowledge base to gain skilled know-how and develop clinical reasoning skills. Reflective learning and the preceptor relationship can support the individual's development of ethical conduct and formation as a professional nurse (Benner, Sutphen, Leonard, Day, & Shulman, 2010, p. 25). Delivery of the three apprenticeships requires supported experience within clinical context and actual patient situations to provide the deliberate practice for skills, clinical know-how, and reflective learning. The supported experience will be provided via the SNR and assist the apprentice with

progression along the continuum from novice towards expert specialty practice.

The SNR model supports the high-end apprenticeships that are defined by Benner, et al (2010) as integrated learning experiences that include several facets. Benner's theory integrates the five stages of skills acquistion, three high-end apprenticeships, the role of preceptors, and clinical coaching plans in developmental support and progression (Benner, Sutphen, Leonard, Day, & Shulman, 2010). While the three apprenticeships all start within the novice learning period, there is growing emphasis on the next level of complexity as the nurse builds a foundation of knowledge and clincal experience as outlined in Figure 2.

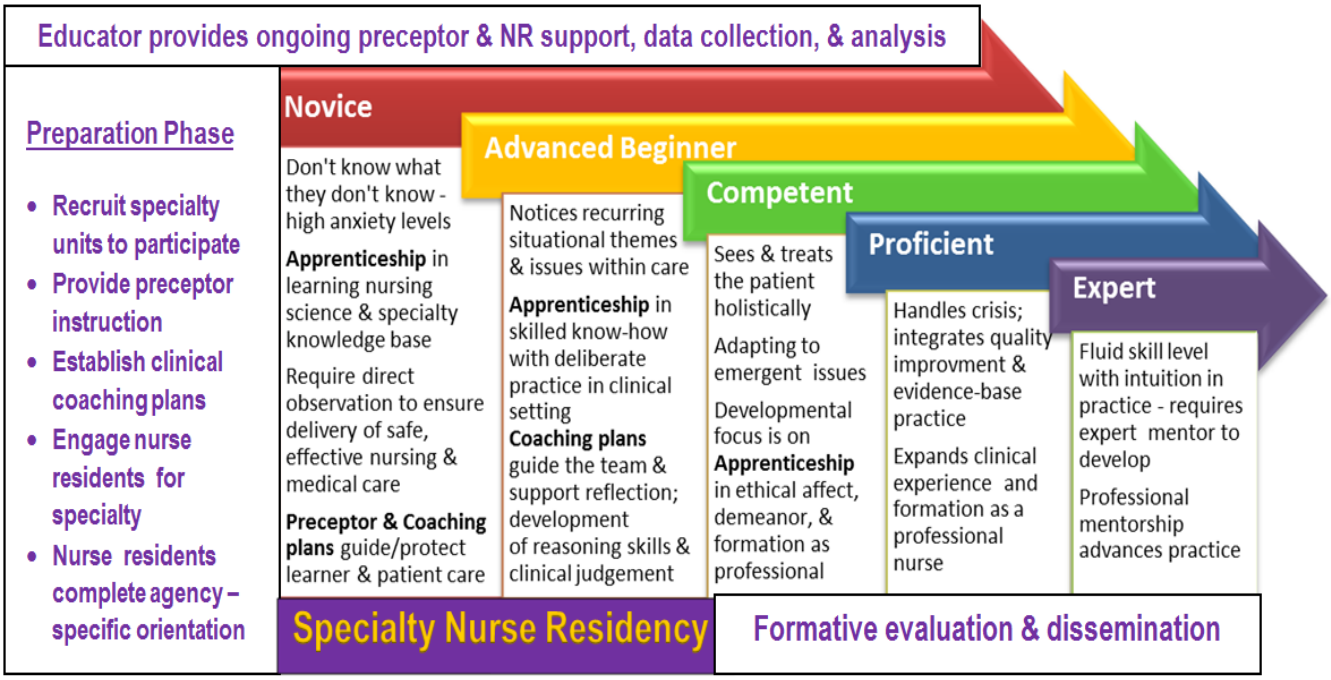

Figure 2. Benner's Theoretical Framework in Context of SNR Preparation and Delivery

Within this apprenticeship model, articulation and making visible the aspects of competent performance and offering supervised practice are essential components. The preceptor provides supervised practice to help the learner reflect on, understand, and articulate personal and individual approaches to clinical practice. Priorites and demands embedded within the clinical situation must be recognized and given a sense of salience or importance. The

apprenticeships include reflection on practice for the purpose of learning from each clinical situation to increase the nurse's ability to use knowledge effectively to improve healthcare for both the individual and the community.

Prior to implementation of the SNR, specialty units must be recruited for participation, preceptor instruction occurs, coaching plans established, and nurse residents hired to the specialty unit. The apprentice nurse will start in the SNR program after agency-specific orientation is completed.

Definitions

Apprentice (or Nurse Resident): The nurse, whether a new graduate or experienced nurse that is new to the specialty and is engaged within the Residency program for a specialty setting.

Apprenticeship: A high-end learning model that includes articulation and making visible the aspects of competent performance. Essential components include offering supervised practice to help the learner relect on, understand, and articulate their own approach to clinical practice for the purpose of learning from each clinical situation. Priorites and demands within the clinical situation are given a sense of salience or importance to increase the nurse's ability to use knowledge effectively (Benner, Sutphen, Leonard, Day, & Shulman, 2010).

Clinical Transition Framework: An evidence-based framework comprised of clearly defined expectations, preceptor program support, protocols, data collection, and experiential learning offered via a combined preceptor-apprenticeship model.

Competence: 1) The application of both skills and knowledge in the completion of a task for fulfillment of a specific role. The skills merge decision making, interpersonal, and psychomotor skills. (NLN, 2013). 2) Competence is composed of knowledge, skills and other components that often include attitudes and values. Performance at a competent level involves

choosing components that fit a specific situation, as needed, and/or using a combination of components in a given situation. Competence 'brings together' disparate attributes and tasks within clinical practice (Fernandez, et al., 2012).

Competency: NLN glossary (2013) defines competency as a professional practice principle identifying expectations for safe, effective performance, whether targeting a task, or a practice role (Wilkinson, 2013).

Preceptor: The experienced practitioner providing transitional role support, experiential learning and competence validation for new staff. While verifying clinical capability, the preceptor protects the patient, agency and profession by ensuring safe, effective care that adheres to all relevant protocols. A preceptor is a trained and selected care provider who assists the new hire to identify learning deficits and goals related to specific clinical experience, skills, and confidence. The preceptor facilitates a plan of action, provides reflection and learning opportunities in the clinical setting (Price, 2014).

Residency: An experiential learning experience wherein the participant applies new knowledge, makes decisions, and learns clinical reasoning skills under the direction of an experienced colleague. A residency, internship, or fellowship is a program of support that provides a trusted colleague to provide support and guidance through the initial period of transition (Cappel, Hoak, & Karo, 2013).

Scope and Limitations

The project will be implemented in specialty care units with the target population for the intervention being the new hires who have no prior specialty care experience. This may include new graduates as well as experienced nurses who are new to the specialty. The data will be collected from the educators, colleagues, and preceptors working with these new-to-specialty

nurses. By its nature, the project will require the use of a convenience sample, but Robbins (2014) suggests that the outcomes might be expected to be similar in other settings, groups, or individuals. Demographic information collected on survey participants will be examined to determine if there are any trends based on primary vs temporary preceptor, or significant preceptor background demographics such as years in specialty.

Limitations of the study include the small sample size, budgetary issues related to time for preceptor access, availability of selected patient diagnoses for experiential learning, and individual biases revealed within the survey responses. If the project is completed within an armed services facility, the civilian federal furlough, sustained high census, high staff turnover, and lack of dedicated administration time for preceptor support may influence the outcomes. If the project is implemented in a single specialty center, the outcomes may not be reproducible in the non-specialty care units. The data from this study will be limited to experienced staff feedback, although many other factors impact transition to practice.

Summary

The purpose of the Specialty Nurse Residency Program (SNR) implementation study is to evaluate the efficacy of a clinical transition framework as applied to competency development within a new specialty area. Outcomes data is gathered from preceptor, colleague, and educator survey responses pre and post-program implementation. The responses from a control group of non-participating specialty units within the same facility will be compared with those from intervention units. The SNR is an evidence-based transition to practice framework that is delivered by preceptors that are fluent in their role as clinical teachers, evaluators, and protectors. Expected outcomes include advanced preceptor support for learning in the clinical environment, as well as their evaluative feedback on the support for learning and competency development

provided by the Specialty Residency Program.

Nursing preparation for each clinical practice setting must evaluate capability to provide competent, safe care, and develop new skills wherever needed. This is particularly critical in care areas where patients are critically unstable, such as intensive care units and the emergency department, but is true for all practice specialties. With the data showing increased retention rates for staff experiencing the transition program, the adoption of a universal framework translates into cost savings for the agency or health system. This Project moves the profession one step closer to identifying best practices for transition to specialty care domains.

CHAPTER 2: LITERATURE REVIEW

Introduction

The literature review provides a project guide that considers both implementation issues and outcomes evaluation of the Specialty Nurse Residency program (SNR). The purpose of this quantitative, descriptive, implementation study is to evaluate the efficacy of a clinical transition framework as applied to competency development within a new specialty area. Program evaluation is based on data analysis from survey responses pre and post-program implementation, as compared to the control group of non-participating specialty units within the same facility. The study adds to the outcomes data reported for the Burn ICU study and may lead to conclusions on possible reproduction of SNR outcomes in other settings. The SNR intervention is an evidence-based transition to practice framework for specialty care units as delivered by preceptors that are fluent in their role as clinical teachers, evaluators, and protectors (VNIP, 2012). Program structure and components are based upon Benner's (2004) skills acquisition theory and integrates concepts from her more recent appeal for a radical transformation in nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010).

Nurse residencies and internships transcend the usual nursing orientation programs by engaging the new-to-specialty nurse with gaining nursing science and experiential learning with focus and complexity that is unique to the practice setting (Pilcher, 2011). These programs are not a new idea and are often used in critical care and surgical units, due to nurses having little or no student experience in these specialties. Studies of the structured programs have shown benefits that include return on investment, improved retention rates, and growth in participant confidence, competence, and satisfaction. Regrettably, there is no consistency in format, forms or process used within these programs.

The nursing profession has experienced a public spotlight and renewed focus on the development of the novice nurse with the recent Institute of Medicine (IOM, 2010) report, *The Future of Nursing: Leading Change, Advancing Health.* The third IOM recommendation states, "Implement nurse residency programs . . . take actions to support nurses' completion of a transition-to-practice program (nurse residency) after they have completed a pre-licensure or advanced practice degree program or when they are transitioning into new clinical practice areas" (IOM, 2010, p.7). This is a call to action for both new graduate and new-to-specialty residency program development, implementation, and analysis.

Historical Overview

In the history of nursing education, a strong foundation of apprenticeship-style of training pre-dated the delivery of nurse education in the higher education sector (Daly, et al., 2013). Many challenges arose with the shift of nurse preparation from hospital-based to an academic focus. Curriculum varies from one academic center to another and barriers have arisen that create difficulties in providing quality clinical experiences. Some clinical settings restrict access to specific clinical areas, patient chart information, or computer systems, yet experience in the clinical setting is vital to healthcare educational programs (O'Brien, 2015). The clinical experience provides an opportunity for learners to apply new knowledge and theory to real world situations and to develop the dexterity skills necessary for entry into initial or a new specialty practice. The literature has validated experiential learning as a vital component of nurse student learning and growth.

Restrictions in clinical sites limit the opportunity to consolidate theoretical knowledge learned in the classroom. Students may feel alienated or distanced from clinical staff. From the academic side, multiple curricula drive undergraduate nurse education, which leads to diverse

expectations of and for students during the clinical placements. Students may feel unprepared for the experience or may not have sufficient knowledge about vulnerable groups within society. Clinical education has become a significant challenge within health care professional curricula (Daly, et al., 2013). Accessibility and quality of the clinical experience are impacted by the capacity of academic programs and the clinical sites. In some settings, the preparedness and attitudes of professional staff have limited the ability to admit learners.

The need for new graduate residency or internship programs is well documented with at least 10 years of focused study and analysis through many diverse research projects (Goode, Lynn, McElroy, Bednash, & Murray, 2013; Ulrich, Krozek, Early, Ashlock, Africa, & Carman, 2010). Goode, Lynn, and Bednash (2009). have collaborated on both development and dissemination of research projects related to nurse residency programs through multiple implementation projects, publications, and presentations at professional conferences.

Anderson, Hair, and Toderos's (2012) systematic review of nurse residency programs (NRP) sought to improve the new graduate transition program delivery. Databases from between 1980 and 2010 were selected based on specific, identified terms. The search resulted in 20 studies that fit inclusion criteria and three major review outcomes recognized. First, there is wide variation in content, teaching, and learning strategies that are used, and this variety makes comparison from one model to another difficult. Second, a lack of theory behind the educational intervention design limits the selection and development of new instruments for measuring the effectiveness of programs. Third, nursing needs studies with a better design and systematic approach. When focusing on the fiscal outcomes, scholars and administrators miss the opportunity to engage strategies that transform the environment for both patient care and workplace culture (Anderson, Hair, & Todero, 2012).

The University HealthSystem Consortium (UHC) used a one-year residency program to transition the new graduate to an *insider* with the skills and knowledge needed to provide high quality, safe care (Goode, Lynn, Kresk, & Bednash, 2009). An academic-practice partnership was found to be necessary and advantageous to the program. The project evaluation plan used four instruments to measure outcomes from the residency program. The tools include the: Casey-Fink Graduate Nurse Experience Survey, McCloskey Mueller RN job Satisfaction Scale, Gerber Control Over Nursing Practice Scale, and a Program Evaluation Scale developed by the research team. The UHC/AACN residency program curriculum identified needs of new graduates related to further skill and knowledge development and fashioned the curriculum to address these needs. A crucial aspect of study outcomes is the strides made towards CMS recognition of nurse residency programs being essential, accredited and possibly supported by pass-through dollars in the same manner that the Centers for Medicare and Medicaide Services provides support for training doctors, pharmacists, and pastoral care residents (Goode, Lynn, Kresk, & Bednash, 2009).

A broader nurse residency analysis was engaged to reflect the goals, themes, components, and strategies of the professional socialization process by Kramer, Halfer, Maguire, and Schmalenberg (2012). The study gathered data from 20 hospitals with magnet designation and found that the Nurse Residency Programs not only had a positive effect on professional socialization, but also were a source of transformative organizational change (p. 156). Issues requiring clarification included the accountability-responsibility issues within delegation, managing patient care delivery, and prioritizing patients, as well as the care, tasks and activities for multiple patients (p. 161). Transformational change came with the shift of thinking from viewing critical thinking as an aspect of autonomy, to realization that the problem in autonomy is

in making the decision, rather than engaging the thinking (p. 163).

Within the residency program, five core competencies included conflict resolution, prioritization, nursing care delivery, autonomy, and nurse-physician collaboration. Elements identified as critical to the transition program were reflective seminars, precepted experiences, skill development, evidence-based practice projects, nurse-physician councils, and sessions for clinical coaching and mentoring. While these projects were all specific to new graduate residency programs, the concepts and components will assist in planning both curriculum and process for the Specialty Nurse Residency and the outcomes measurements that are pertinent to current practice needs.

Current Findings

The IOM recommendations include the need for specific transition programs to support the new-to-specialty nurse (IOM, 2010). While some studies take the next step to describe and evaluate how a new graduate Residency model supports transition into a specialty practice setting, no universal approach has been found in the literature. Some components are the same as those offered within new graduate NRPs (Goode, Lynn, McElroy, Bednash, & Murray, 2013). The transition programs consistently resulted in improved new graduate nurse retention and cost benefits.

A universal feature of the NRP is the use of preceptors for supporting, teaching, and validation of performance (Hawkins, 2012; Robbins, 2014; Ulrich, Krozek, Early, Ashlock, Africa, & Carman, 2010). Integrative review done by Rush, Adamack, Gordon, Lilly, and Janke (2013) revealed that common program elements included a specified resource person(s), mentor or preceptor assignment, inclusion of formal education, and peer support systems. Whether a program serves the new graduate or new-to-specialty nurse, the program will include a

combination of didactic instruction and hands-on experiential learning. In the literature review studies, the type of instruction, program length, and supports provided varied considerably.

Glynn and Silva (2013) used a qualitative design to determine that a specialty nurse residency program (SNR) is significantly helpful for orienting to a critical care area such as the emergency department. The researchers identified key features that support the successful transition from new graduate to emergency nurse including; didactic, clinical content, and the roles of both the preceptor and unit-base clinical nurse specialist. The SNR fostered the acquisition of new knowledge and skills in a specialty area, becoming more proficient, and assistance with role transition.

Another specialty, oncology nursing, fostered an evidence-based approach to SNR program development (Parchen, Castro, Herringa, Ness, & Bevans, 2008). The literature review identified the recurring gaps in experience and organizational skills, along with the challenging aspects of interdisciplinary team communications and large patient assignments. With examination of the literature, several recurring themes arose. Nurse residency programs for either new graduates or new-to-specialty nurses appear to consistently produce better retention rates, increased competency achievement, higher confidence levels, socialization, and nurse satisfaction with the role and position (Childress & Gorder, 2012). The project outcomes identified preceptor selection, flexibility, and coordination of staff as key factors contributing to program success.

Preceptor development and support, critical thinking development, and validity of competency assessment tools are all recurring themes within the literature pertaining to transition to practice, whether with a new graduate or a new-to-specialty nurse (Anderson, Hair, & Todero, 2012; Butler, et al., 2011; Childress & Gorder, 2012; Goode C. , Lynn, McElroy, Bednash, &

Murray, 2013). Butler, et al (2011) found that preceptors had difficulty with the competency assessment tool due to the language and wording. This calls to mind the importance of Lenburg's (2010) theory and concepts related to the Competence Outcomes Performance Assessment (COPA). The COPA model identifies eight essential performance categories, but also encourages educators to write performance critieria that are clear, concise, and concrete. The specific performance criteria and critical elements are foundational tools for ensuring clearly identified expectations for precpetors and the new-to-specialty nurse with whom the preceptors may be working. (Lenburg, Abdur-Rahman, Spencer, Boyer, & Klein, 2011). These performance criteria are written into the clinical coaching plans and establish a template for the precepting experience.

The literature also notes a lack of continuity with preceptors over time and some preceptors being engaged in the assessment process for very brief time periods. Preceptors might be assigned to work as a primary preceptor and thus be responsible for planning, goal setting, weekly meetings, and communication issues with the manager and educator. Other clinical staff may be used as preceptors for specific tasks or to cover time periods when the primary preceptor is not available. A qualitative study done with preceptor and new graduate focus groups identified that multiple preceptors were seen as an asset more often than a drawback by the new graduates (Watters, 2009). What mattered most with changing preceptors, is the quality and consistency of communication that occurred between both preceptors and new graduates.

Coaching plans address the issue of preceptor-to-preceptor communication by providing a location for documentation of accomplishments and challenges that embody the clinical learning. The other advantage of the Coaching Plan Templates is that a standard exists for

consistency in measuring outcomes. The tool travels with the apprentice nurse, moving from the supervision of one preceptor to the next, and displays evidence of both the capability and the learning needs of the apprentice.

The effect of precepting on the development of critical thinking skills for the new nurse in the critical care unit (ICU) is vitally important (Kaddoura, 2013; Sorensen & Yankech, 2008). The complex environment of the ICU is a very challenging place to enter and achieve competency for a new-to-specialty nurse. The Kaddoura (2013) study revealed the collaborative relationship that is needed for successful critical thinking development on the part of the new nurse. In preparing preceptors for the role, educators must consider the elements of the relationship that promote critical thinking, clinical reasoning, and nursing judgment.

The focus on clinical reasoning was a crucial outcome of the research and analysis conducted by Benner, Sutphen, Leonard, Day, and Shulman (2010). The resulting text, entitled Educating Nurses: A call for radical transformation, calls for nurse residencies for both new graduates and those who are new-to-specialty. Benner also calls for three high end apprenticeships, which builds upon the original theory of nursing skills acquistion (Benner,1984).

Each specialty requires a unique set of knowledge, skilled know-how, and clinical reasoning skills. Learning is best integrated into practice when the learning is connected to clinical context, making the clinical experience essential for developing a specialty knowledge base. Specialty unique experiential learning experiences are needed for each new practice domain that a nurse enters. Whether the nurse is moving from home care to intensive care, from medical-surgical to extended care, or from recovery room to maternity; each domain requires a specific set of knowledge, skills, and reasoning. As outlined by Benner, et al (2010), the

deliberate practice within internships and residencies offer a prime opportunity for reflective practice and preceptors are optimal instructors/mentors to support the learning experience.

Conclusion

The literature informs us of gaps in research, program structure, and evidence based practice related to nurse residencies and preceptor programs. The crucial need for evidence-based instruction for preceptors is clearly outlined, as well as the important role that preceptors play in developing new nursing staff and protecting patients from error or harm. There is little or no evidence that identifies optimal transition program components or how to compare one transition program to another. Yet the research and documentation is clear that preceptors require specific instruction and support systems if they are to foster the clinical reasoning skills that Benner emphasizes.

Development of a nurse residency offers an opportunity to test concepts and strategies for organizational transformation and experimental learning theories that involve staff and students with interactive engagement. To test the concepts, implementation projects such as the one using the SNR must be developed, outcomes data analyzed, and project components assessed for the impact on program delivery. To date, most residency programs have focused the data collection on the nurse resident's individual development and retention data. While retention is crucial for making the fiscal case for residency implementation, the opportunity to engage strategies that transform the environment for both patient care and workplace culture may be missed (Anderson, Hair, & Todero, 2012).

Currently, nursing utilizes a wide variation in content, teaching, and learning strategies for transition programs. This variety in tools and styles makes comparison from one model to another difficult. The literature does identify important components of transition programs as

including didactic, clinical content, and the roles of both the preceptor and unit-base clinical nurse specialist. These common features of the new graduate transition program will be considered as essential components to be addressed within the new-to-specialty framework.

There is a lack of theory behind many educational intervention designs, which limits the selection and development of new instruments for measuring program effectiveness. Without a consistent theory foundation, program design analysis cannot determine if current evidence based practice principles or concepts are followed. This project builds upon the foundation of Benner's theory of skills acquisition, with an additional focus on clinical reasoning development and professional formation. Inclusion of the three apprenticeships that Benner calls for requires conscious planning if they are to be an effective part of the instruction and reflection. Benner's theory works synergistically with the COPA model. The competency focus of the COPA model provides a strong foundation for the clinical coaching and competence assessment plans that incorporate both performance critieria and learning strategies for goal achievement. In the SNR, clinical coaching plans will provide concrete, concise, and clear directions for experiential and reflective learning. Preceptors will learn both about how to foster critical thinking skills and how to support the development of skilled know-how, nursing judgment, and formation as a professional. The plans provide documentation of both achievements and learning needs. An important role of the coaching plans is that of communication from one preceptor or educator to the next. The tools ensure continuity of learning and competence assessment, targeting specific patient care or nursing function goals.

The data collection for this project shifts from targeting the new hire, to evaluation of the program, process and tools that are used. Feedback gathered from the experienced preceptors, managers, and educators will evaluate both program and component effectiveness. The SNR

model is based on a sound theoretical foundation and may lead to further analysis of both tools and framework components needed for effective nurse development.

A specialty practice residency or internship is needed to address the recurring gaps in experience and organizational skills, along with the challenging aspects of interdisciplinary team communications and large patient assignments. This Specialty Nurse Residency project adapts a clinical transition model that was successful in a major Burn ICU and seeks to reproduce the positive outcomes in other specialty care settings. This project will advance the use of an universal approach to transition for new-to-specialty nurses. This focused specialty nurse Residency program will assist the nurse resident in sucessful transition into a new challenging clinical practice. The SNR utilizes Benner's theory of skills acquisition, along with Benner's recent work related to transforming nursing education, to develop the specialty knowledge base, skilled know-how, and clinical reasoning of new-to-specialty nurses. The coaching plans will guide the preceptor-NR team while providing concrete, specific guides for reflective learning. The tools also provide the crucial communication linkage from one preceptor to another.

Nursing preparation for each clinical practice setting must evaluate the capability of the nurse to provide competent, safe care, and develop skills wherever needed. Strong clinical skills and a unique knowledge basis is crucial for safe, effective nursing in all practice specialty settings. Educators from both academic and practice settings must ensure that the new-to-specialty nurse and preceptor have the best possible research, theory, and evidence-based tools and techniques. This project will collect data that may determine whether the learning, skills, and reasoning development outcomes of the Burn unit project are reproducible in other specialty care areas.

Summary

To implement science within nursing care and within the development of the new-to-specialty nurse, this work will incorporate a blend of research outcomes, nursing theory, instructional strategies, and validated tools for collection of outcomes data. The COPA model is a foundational framework for the SNR model. The model addresses nurse competencies, but also the methods for developing and evaluating those competencies (Lenburg, 2010). The COPA model works synergistically with Benner's skills acquisition theory as part of the new-to-specialty nurse development process (Benner, 2004). Benner's foundational theory integrates experiential learning, deliberate practice, and adult learning theory to form core active learning strategies for the transition program. Benner's more recent publication, *Educating nurses: A call for radical transformation*, will shape the current focus to teach for a sense of salience, integrate classroom with clinical, emphasize clinical reasoning, and shift from socialization to the concepts of formation (Benner, Sutphen, Leonard, Day, & Shulman, 2010).

Evidence-based preceptor courses develop preceptors that are able to focus on their role in fostering critical thinking capability in the new nurses with whom they precept. The preceptors use competency tools built upon the COPA framework, a model that matches performance criteria with learning strategies and reflective learning activities. Both preceptor and new-to-specialty nurse will utilize clinical coaching plans to practice specific skills and engage in reflective learning and documentation of performance (Lenburg, Abdur-Rahman, Spencer, Boyer, & Klein, 2011). This project engages evaluation to select the most appropriate process and tools for data collection. A validated survey tool collects data specific to the crucial aspects of effective transition programs and work environments that prioritize competency development. Data analysis is expected to determine whether the outcomes of the successful

Burn unit project are reproducible in other selected specialty practices (Robbins, 2014).

The planned research design and methodology builds upon the background information and literature search. In project delivery, both implementation and evaluation of outcomes are vital if the profession is to learn from each change effort. The research components are a significant part of the work by providing evidence for further implementation or research needs. Chapter Three will discuss the proposed research project design, selected survey instrument, data collection, management and analysis plan, and appropriateness of the methodology and feasibility.

CHAPTER 3: METHODS

Introduction

The diversity of healthcare settings, environments and specialties results in academic programs that teach the concepts and theory of providing health care, but cannot provide sufficient experiential learning to acclimate the novice to all the diverse aspects of nursing that might be faced in actual clinical practice. Experiential learning occurs within the context of patient care, thus each nurse faces 'transition to practice' with their first nursing role and each time that they change specialties (Cheung & Noel, 2014). The focus of this implementation project is transition into a new specialty area. Many studies have targeted transition for new graduates, but there is little data related to the need for additional education and support when the nurse moves to a new specialty domain.

This quantitative, quasi-experimental, descriptive study will evaluate the efficacy of a Specialty Nurse Residency Program (SNR) based on data analysis from preceptor, manager, and educator survey responses. The study adds to the outcomes data reported for the Burn ICU project and evaluates whether the implementation outcomes produced in Robbins study (2014) are reproducable in other specialty settings. Control group data will be gathered from specialty units within the same agency that are not participating in the residency program. Prior to initiation of the SNR program, staff from both intervention and control group units will be surveyed with the Workplace Survey tool. At least four months post SNR program implementation, post intervention data collection occurs synchronously in both intervention and control groups. All data will be subjected to comparative, descriptive analysis as described in data analysis section.

The SNR intervention is an evidence-based transition to practice framework for specialty

care units as delivered by preceptors that are fluent in their role as clinical teachers, evaluators, and protectors (VNIP, 2012). Program structure and components are based upon Benner's (2004) theory and integrates concepts from her more recent appeal for a radical transformation in nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010). For this project, quantitative data collection is chosen, due to the need to engage senior leadership in financing the develoment and support progams. Nurse leaders seek measurable outcomes that include fiscal impact such as the retention and safety data as shown by Hawkins (2012) and Robbins (2014).

Project Design

An Army Medical Center hosted the original pilot study that revealed increases in both nurse retention and satisfaction as study outcomes. A fifty percent reduction in turnover was a significant positive outcome within the Burn unit pilot as well as substantial improvement in survey results from tools (a) assessing new hire competency, (b) preceptor's evaluation of program, and (c) the assessment of process used for transition (Robbins, 2014, p.4). Recently, a request was received to expand the implementation to other specialites to determine if the same impact could be reproduced in other units. With past results and the specific request in mind, this project will implement the Specialty Nurse Residency (SNR) framework in additional specialty units and gather evidence from preceptor, educator, and manager survey responses.

The project will focus assessment on the aspects of process and tools used to support transition to practice as well as competency outcomes in the clinical setting. Data management will include analysis of survey responses from pre and post-program implementation, as compared to the control group of non-participating specialty units within the same facility. Specific survey items seek to evaluate the level of support provided for development and

evaluation of critical thinking, teamwork, communications, skilled know-how, a safe learning environment, and clinical competence. Comments and feedback are also solicited regarding the use of written teaching or clinical coaching plans to address specific learning or performance goals within the specialty practice.

Instrument

The Workplace Survey instrument targets feedback on the learning environment, elements of support systems, communications, new hire critical thinking development, and several other factors. The tool was developed and analyzed for evaluation of the Vermont Internship program for new graduate nurses, but the structure and items are appropriate for this specialty transition program as well. The tool solicits feedback from experienced clinical staff pertaining to program impact and efficacy in developing new-to-specialty nurses. With a focus on the program structure and components, the data is not reliant on the limited viewpoint and data source of new hires. Instead, the tool gathers data from the individuals that are experienced in both the specialty practice and with delivery of orientation and transition programs. The experienced staff, preceptors, managers, and educators are best suited to providing evaluative feedback on program impact and efficacy.

Use of the Workplace Survey tool focuses the assessment data on the program rather than the individuals, while providing a possible point for limited comparison with the historical data collected from the original Burn unit project. Content validity of the survey tool was established through a review of the literature on work environment, orientation for new employees, internships, nurse residency programs, and preceptor development. The literature was then filtered through the real-life experience of nurse advisers and professional development experts from the Vermont Organization of Nurse Leaders.

Reliability and Validity of Survey Tool

The Workplace Survey underwent reliability and validity analysis by Hagman and Winstead-Fry (2009). During the psychometric testing, the 23 item questionnaire was answered by 365 nurses over the course of the grant period. The nurses who answered the questionnaire were a combination of managers, educators, and staff nurses. For purposes of the validity study, no effort was made to sort the data by position, as different organizations have different titles for similar roles. Factor Analysis was used in the Workplace Survey tool analysis, as there were no other comparable scales to administer.

Reliability is concerned with how consistently we are measuring what we are trying to measure, and reliability can be analyzed in several ways. In the analysis of the Workplace Survey, Cronbach's alpha was used as a measure of the internal consistency of the scale. This modality was used because other measures assume stability in the score, for example, test-retest reliability compares tests from two different times. Because the specific grant project expected the new nurse to increase in capability, to expect comparable scores at two different times was not an option. The scores range from -1 (no consistency) to 1 (high consistency). The Workplace Support Form analysis presented a Cronbach's alpha of .962 (Hagman & Winstead-Fry, 2009, p.10).

The survey tool was also factor analyzed and thought to be a one factor scale because the environment is a summation of many institutional inputs. For the most part, the Workplace Survey Tool performed as expected. Most of the items loaded on the first factor and that accounted for 55.8 % of the variance (Hagman & Winstead-Fry, 2009, p.17). Reviewing the results overall demonstrated that items 2, 3 and 4 could be removed from the scale, as they loaded on both factors, suggesting ambiguity. Based on the factor analysis results, the

recommendations for tool revision were adopted, and the tool was used for ongoing transition program assessment and evaluation. Permission to use, replicate, and adapt the tool was received from the President of the VNIP Board of Directors (see Appendix B).

The survey addresses collaboration with disciplines other than nursing, the culture of the organization as relates to learning, and teamwork. Several questions address the orientation process as far as safety for patients and new hires are concerned, as well as the efficacy of preceptors. There is also space for general comments about program strengths and limitations. This study will explore the external validity of applying the SNR framework in new settings, thus reproducing the outcomes from the previous study in additional specialty practice areas.

Clinical coaching plans were not a significant component of program structure when this tool was validated, thus they are not referred to within the survey items. Experience with the coaching tools has gained anecdotal feedback pertaining to their significance, thus a comment section has been added related to these tools. The feedback on the coaching plans will determine whether further study is needed related to their role within transition to practice programs. If the coaching plans are playing a significant role in nurse development, a Delphi study may be the next step in developing a survey tool to determine optimal program components.

Data Collection, Management and Analysis Plan

With Institutional Review Board approval received from the American Sentinel University review board (see Appendix C), preceptor courses were scheduled, and standardized coaching plans developed for each participating unit (see Appendix D for sample coaching plan). The Workplace Support Survey is administered to staff from the participating units, both intervention and control group units, for baseline assessment. Once this preparation is complete, the Specialty Nurse Residency program will be implemented at the same agency that hosted the

Burn unit pilot project.

The SNR program will engage the next new hires starting after preceptor, SNR program, and coaching plan preparation is completed. All new-to-specialty nurses hired to the participating specialty units will be enrolled in the SNR. After at least four months of program implementation, data collection will occur with all preceptors, interdisciplinary colleagues, educators, and managers that have been involved in SNR implementation. At the same time, data collection will occur with the same patient care professionals from the control group specialty units. The control consists of clinical staff, educators, and managers from specialty units that did not enroll for the Specialty Nurse Residency program. The responses of the two groups will be compared, along with further descriptive analysis, see the Data Analysis section for details.

Data will be collected from all skilled staff that are involved in the SNR intervention and control group units. The educators, preceptors, and managers provide feedback pertaining to program success from their respective points of view. Respondents will also be asked to give feedback pertaining to coaching plans to determine the role that these tools play within the framework. With the survey administered synchronously both before and after SNR implementation for each intervention and control unit, workplace environmental factors will be the same for each group. Comparison of responses between the groups is expected to reveal the impact of program implementation and its efficacy.

Survey tool administration will be accomplished via both paper copy and web-based delivery to collect preceptor, educator, and manager evaluative feedback. The Primary Investigator will establish the tool within Survey Monkey with collection of Internet Protocol (IP) addresses disabled. A link to the survey will be offered on facility computers to give access

to the project participants within their workplace, although completing the survey is not limited to workplace computers. The survey link will be e-mailed to each potential respondent, in case they prefer to complete the tool at a location other than their workplace.

For the convenience of survey respondents, a paper survey tool is available along with direct web-based data entry. Providing survey tools via both web-based and paper modalities has proven effective in similar endeavors in the organization. The paper survey tool will be distributed at the beginning of each data collection period to any individual that requests paper rather than electronic data entry. A statement within the consent emphasizes the instruction that respondents are to complete only one survey per person, either the web-based tool or the paper version. The survey is offered via both modalities for participant convenience and it is emphasized that they do not submit data more than once per data collection period.

An agency-based research assistant will distribute, collect, inform, and remind staff about the survey. Respondents that request the paper version will receive an addressed envelope with the survey tool. The sealed survey envelopes will be placed in the agency's internal mail system for delivery to the office of the Institute of Surgical Research, attention: *Transition Program Data Collection*. The surveys are then gathered by the research assistant and kept in a secure location until they are delivered to the investigator. The site *Principle Investigator and content expert* will act as a consultant on data collection, analysis, and in referring questions to an agency statistician if data analysis expertise is needed.

Repeat e-mail reminders will be sent to prompt responses, but no identifying data is collected so all communications will be generic. The initial data collection will be completed prior to the start of the Specialty Nurse Residency program. Re-assessment will occur after four months of SNR implementation with a minimum of three weeks span of time for data entry.

Potential respondents will be informed of the start and end date as determined for each data collection cycle.

The survey tool uses an ordinal level of measurement within a Likert scale of 1 to 5; from strongly disagree to strongly agree. Having respondents enter data directly into a computer program eliminates the possibility of transcription error and assists in ensuring confidentiality of information. The Investigator will enter the data for any paper survey responses that are submitted. A research assistant will re-check data entry done by the investigator, and the investigator will do random re-checks on data to ensure 100% accuracy of data entry. Any individual that has access to any survey data will complete the CITI research ethics training prior to involvement with this implementation and data collection project.

The cost of direct entry is negligible, as the investigator holds a subscription to Survey Monkey with a secure data management add-on. The respondent data is available to the investigator for weekly review to watch for response bias, gaps in responses, or errors that might be corrected. Survey responses will carry no individual identifying information, although demographic data may allow grouping the participants by their role or prior experience. These groupings will occur only if sufficient responses in each group to ensure anonymity within aggregate data. Descriptive analysis of data will identify the mean, range of scores, and standard deviations. Data will be analyzed based on aggregate scores, rather than matched pairs, with comparison of total aggregate score pre-intervention, compared with total aggregate score post-intervention for each of the control and intervention unit groups.

Sample & Setting

The setting for this project is an Army Medical Center, which was the site of the Burn unit pilot project. A letter of support has been received identifying the site coordinator and her

role (see Appendix E). The accessible populations for this study are staff nurses and their colleagues working in the Army Medical Center who will serve as preceptors, educators, and managers of new hires for the involved specialty care units. The responses from the intervention group will be compared to control group responses comprised of the same set of staff members from specialty units that are not participating in the SNR program. A consecutive, convenience sampling strategy will be used and all staff who meet the inclusion criteria will be invited to participate. The inclusion criteria target purposive sampling of the participating units with a focus on a specific expert sample within each clinical setting (Patterson, et al., 2013). The expert convenience sample comprises all educators, managers, preceptors, and engaged colleagues that have influence or impact on the SNR program on the designated intervention or control group units.

The total sample size is based on the number of RN and LVN staff on the participating units, but the crucial data will be solicited from the experts on these units, the educators, managers, and preceptors who are directly involved with both the intervention and competency assessment responsibilities for new staff members. To achieve a 90% level of confidence, a total sample size of 155 survey respondents is required. This sample size recruitment is feasible considering the number of preceptors engaged and instructed for the single Burn Unit project totaled 110. For the SNR project, the specialty units that elect to be part of the implementation project determine assignment and number of participants and control groups for the study. Currently, the project plan includes the Mother-Child Health, Emergency Department, and Adult Intensive Care Units and their staff.

The population for this study includes staff nurses and their colleagues working in the involved specialty care units. The responses from the intervention group will be compared to

control group responses comprised of the same set of staff members from specialty units that are not participating in the SNR program. A consecutive, convenience sampling strategy will be used and all staff who meet the inclusion criteria will be invited to participate. The inclusion criteria comprises all staff and engaged colleagues that have influence or impact on the SNR program on the designated intervention or control group units. Demographic data allows comparison of clinical leadership staff responses to non-leadership. For the proposed project, the specialty units that elect to be part of the implementation project determine assignment and number of participants and control groups for the study.

Risk to the participants is no greater than that for any newly hired staff member and no identifying personal information will be collected for purposes of this project. The benefits expected for the participants will be in the form of opportunity for enhanced preceptor development and for improved orientation for new hires. Improved retention of new staff can also improve working conditions through reduction in vacancies and recurring orientation needs.

Threats to Internal Validity

A threat to validity in this study is the use of a single, dated tool for data collection. The Workplace Survey is a tool that is specific to the work of the VNIP Internship project, but was developed and validated six years ago. The current SNR model includes program components and tools that were not specifically considered at that time, thus the assessment tool offers a risk of gaps in data as pertains to current program efficacy.

Strengths of the project design include utilization of an evidence-based preceptor development program and a residency framework based on the nationally recognized clinical transition framework. The SNR model received broad-based evaluation and customization in the agency's Burn ICU (Robbins, 2014). Formative and summative evaluation of the previously

applied SNR model allowed for evidence-based improvements in the framework and development of tools that are customized to address agency-specific needs and issues.

The fact that SNR delivery may be impacted by adequacy of staffing and surges in admission rates is a design weakness. Limitations of the study include sample restrictions, budgetary issues related to time for preceptor training or access, availability of selected patient diagnoses for experiential learning, and individual biases revealed within the survey responses.

Data Management

All documents will be kept in a locked filing cabinet and no personal information or unique identifier is retained. Data is stored on password protected data file devices, which are also secured within a locked office when not in use. Copies of data will be kept and stored as electronic files in an Excel codebook. All data is accessed only by the investigator and research assistant, who have both completed CITI research ethics training with copies of instructional verification kept in the secure files. Data will be stored for five years in a locked, secured file cabinet, within a locked office. When the five years have expired, the data and memory sticks will be destroyed in a manner that erases the data and prevents all methods of potential retrieval.

The primary variables in this study include a two-level categorical independent variable (SNR-Intervention/Control groups) and a continuous dependent variable of aggregate scores on the Workplace Support instrument. Possible mediating variables within the SNR include the clinical proficiency of the preceptor, the use of clinical coaching plans, and the level of experience that the apprentice brings with them to the new specialty setting. The apprentice-preceptor relationship is a moderating variable that may influence the impact of the independent variable (SNR) on transition efficacy.

Demographic data will be collected from both the intervention and control group units.

The data analysis will include evaluation for any missing data or outliers. The make-up of each group will be analyzed to ensure comparable group make-up with consideration of sub-group division between clinical staff and those in leadership roles. Some characteristics that might influence the outcomes include age, gender, and professional role. Any confounding variables will be entered into the analysis as a covariate (Kim & Mallory, 2014; Pallant, 2013). If no meaningful variable is found between the groups, ANOVA and t-test will be run. Cronbach's alpha will be used to measure the internal consistency of the scale and individual items.

Data will be analyzed using an independent sample t-test to determine the mean difference in scores on the Workplace Survey instrument between the SNR intervention and control group. If the dependent variable does not meet the assumption for normality, the Mann Whitney U nonparametric test will be used as an alternative. Descriptive statistics will be used to describe the sample characteristics and to determine frequency and proportions of categorical variables. A preliminary analysis will include the assumptions of t-tests: normality and homogeneity. Modes for each survey item will be calculated for all Categorical Ordinal variables (Q1 –Q21) and descriptive statistical tests will be completed for the continuous variables. Some of the categorical variables such as unit, role, and preceptor education will be separated into cohort groups for comparison of data outcomes from one cohort to another if sample demographics allow. Pearson's correlation may be used to explore possible strength of relationships between continuous variables, especially as relate to the total scores achieved in comparison to respondent's *years of experience* or the agency's *transition program duration*.

Methodology Appropriateness

The planned methodology fits with current and developing practice for nurse residency programs. After the Specialty Nurse Residency implementation, an assessment of post transition

program responses will be compared with staff responses from the control group as well as compared with aggregate scores of data collected from each unit prior to the intervention. The synchronous collection of survey data ensures that the environmental influences are the same for both groups. Optimal data collection would periodically re-evaluate and the planned tool was developed with periodic use in mind. Decisions on a subsequent data collection will occur after analysis of project outcomes. Formative changes within the framework or project will occur as needs or participant feedback indicates.

Feasibility

Members of the senior leadership team at the Army Medical Center have requested expanded use of the SNR framework with assessment of the project impact on staff and budget. To obtain staff satisfaction and confidence in competency development for comparison, a control group will be comprised of specialty units that do not participate in the SNR. This change project may add to the nursing profession's data related to nurse residency programs and clinical experiential learning. The project and data collection place no patient or staff member at risk of harm, in fact preceptor supervision can provide greater protection against errors, or near misses. This project is both feasible and appropriate for implementation, data collection, analysis, and dissemination of outcomes. Implementation and outcomes analysis are requested by senior leadership at the Army Medical Center that offered the pilot project in the Burn unit.

Summary

The problem being addressed in this study is that new nurse graduates and nurses transitioning to specialty care units are not adequately prepared to meet the expectations inherent to clinical practice various specialty roles. The nurse coming to a new specialty area reverts to novice level of capability and is unable to anticipate the needs of an unstable patient.

Experiential and reflective learning is required before unique knowledge and various theory concepts can be integrated into varied and dynamic practice experiences (Benner, Sutphen, Leonard, Day, & Shulman, 2010).

This project will use the Workplace Survey to answer the question: Is the success of the Specialty Nurse Residency program reproducible in specialty units other than the Burn ICU (Robbins, 2014), as evidenced by preceptor and educator feedback before and after program implementation? The workplace survey data analysis will make comparisons based on data from preceptor and educator survey responses pre and post-program implementation, as compared to the control group of non-participating specialty units within the same facility. The tool will also allow some item comparisons to the Burn Unit project outcomes.

The preceptor's role and instruction has undergone meta-analysis, which leaves clinical coaching plans as the significant mediating variable within the study framework. This project will engage in quasi-experimental use of coaching plans within the SNR to support the delivery of Benner's three high-end nurse apprenticeships. The proposed project solicits evidence from preceptors and educators that pertains to the impact of preceptor support systems, structured clinical coaching plans, and other framework components on the development of these new-to-specialty nurses. The experienced staff members are the crucial survey respondents as they are linked with the specialty practice, SNR program formative feedback, use of coaching plans, and NR competence assessment.

Research studies can be used to evaluate a process, the impact of a program, or its costs (Polit & Beck, 2014). Each of these aspects can help senior leaders make decisions about program implementation, continuance, or modification. In this project, a descriptive research approach with quantitative data will be used to determine the strengths and limitations of both

the program and its components.

Once all supporting documentation is in place, the steps in project implementation and data collection will be engaged. In the next section of this paper, the reader will be engaged with the details of data collection and analysis. Following an introductory reminder of the purpose of the project, the plan for Chapter 4 is to present the outcomes and findings of program and study implementation.

CHAPTER 4: FINDINGS

This chapter describes the process for data collection and analysis used to study the impact of a Nurse Residency Program used for Transition to Specialty Practice. After revisiting the project purpose, survey demographics are reported, data analysis is discussed, the research question restated, and reliability of the survey instrument is examined. A chapter summary clarifies the initial findings of the project.

The Purpose of the Project

The Specialty Nurse Residency (SNR) implementation project was engaged to evaluate the efficacy of a clinical transition framework as applied to competency development and validation within a new specialty area. The study adds to the outcomes data reported for the Burn ICU study and may lead to conclusions on possible reproduction of SNR outcomes in other specialty settings (Robbins, 2014). The SNR is an evidence-based transition to practice framework for specialty care units as delivered by preceptors that are fluent in their role as clinical teachers, evaluators, and protectors (VNIP, 2012). The program structure and components of the SNR are based upon Benner's (1984) skills acquisition theory and integrates concepts from her more recent appeal for a radical transformation in nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010). The study explores the external validity of applying the SNR framework in new settings, thus reproducing the outcomes from the previous study in additional specialty practice areas.

The PICOT question for this implementation project is: Are the outcomes of the Specialty Nurse Residency reproducible in specialty units other than the Burn ICU (Robbins, 2014), as evidenced by preceptor and educator feedback with comparison of survey responses before and after program implementation? The Workplace Support Survey tool is used for

quantitative data collection and the study collects data from both control and intervention units. The survey was created and validated by Vermont Nurses in Partnership (VNIP) to measure changes in the workplace support systems as pertains to competency development and validation (VNIP, 2016). For this study, the tool was distributed by both electronic and paper modalities. The total scores of pre and post-intervention survey responses are compared within the same facility. The null hypothesis states that there will be no significant difference in aggregate scores before vs. after the intervention between the intervention and control groups.

Data collection and analysis from the Workplace Survey adds to the evidence related to the applicability of the transition framework for multi-unit utilization. Further data collection may indicate whether the model is applicable for multi-agency utilization across the broader medical system but generalization of the outcomes was not the purpose of this project. Formative data collection occurs synchronously with Workplace Support Surveys to adapt and modify the program and tools for safe and effective use in diverse clinical settings. In this case, some formative data is solicited via comments, suggestions, and acecdotal feedback.

Intervention

The intervention being implemented in this project is a Specialty Nurse Residency that engages both evidence-based preceptor development and competence validation tools. Prior to implementation, the implementation plan and tools were customized to the unique demands, challenges, and resources within the agency. Unit specific competency validation and coaching plan tools were developed and the Universal Competency-Based Orientation (CBO) tool analyzed to ensure adequate competence validation. Joint Commission and other reviewer requirements were used to ensure full compliance with all elements essential for safe and effective healthcare environments.

Evaluative feedback for retention or rejection of the null hypothesis was gathered via survey item responses and anecdotal feedback. This is only one of many aspects for measuring success of the program. Robbins (2014) project used retention data, competency development progression, and staff satisfaction as well as metrics related to individualized coaching plans and preceptor development. The original intervention and analysis occurred over a period of two years whereas this implementation study was completed within several months.

Sample

Survey responses were solicited from the population of managers, educators, and clinical staff on units identified as intervention or control group units. The original plan for data collection proposed a desired sample size of 155 survey respondents to achieve a 90% level of confidence. This sample was based on implementation unit expectations for Maternal Child Health (MCH), Intensive Care (ICU), and the Emergency Department (ED). As the project evolved, the five adult ICUs were withdrawn as planned intervention units due to unexpected lack of administrative support due to personnel changes. The ICU was then designated as a control group.

The original sample size calculation was based on the anticipated number of staff that would be involved in the project. Post implementation, revised reports from unit managers revealed a larger number of total staff employed on the participating units. The total population changed significantly to a combined workforce of 835 on the eleven units engaged as either control or intervention sites. Of that total, 608 are RN and LVN direct care providers. All staff involved in transition to practice met the inclusion criteria for survey data collection. While some staff demographic data is available, it is difficult to sift out those involved in the intervention vs those not involved. The role of night and evening shift within this work was

limited, especially with the short timeline for implementation and data collection. Many staff members had no contact with the program or its participants and were thus unable to give feedback pertaining to SNR impact. These factors combine to make an accurate number for the total population difficult to determine. Recalculation of the minimum recommended number for the survey based on the full complement of 835 staff members produced an updated sample size goal of $n = 205$ (Raosoft, Inc, 2004). The actual survey response was a sample size of $n = 169$. This lower response rate increased the margin of error from 5% to 5.65% when based on the previously determined confidence level of 90%.

Review of the 169 surveys necessitated elimination of eight submissions due to complete lack of demographic information on the form. Without unit or intervention designation, there was no way to determine if these respondents were contributing data as control or intervention group members. The remaining surveys number 161 with 88 responses from control group units and 73 from units which experienced the Specialty Nurse Residency intervention.

Table 1.

Staff and Survey Statistics

	Number of Beds	Total Staff	Number of RN/LVNs	Number of Preceptors	Total Usable Surveys
Intervention Units					
Emergency Department	67	250	163	20	26
MCH Post-Partum, Labor & Delivery	22	108	74	19	47
No Unit Reported					8
Control Units					
MCH NICU & Ante-Partum	34	99	73	44	48
Intensive Care Units (ICU)	78	378	298	140	23
No Unit Reported					9
Totals	201	835	608	223	161

The overall project plan allowed survey submission via web-based or paper survey tools. A disclosure statement with contact info introduced the survey and offered an option of continuing with data submission or declining. With the initial cyber-delivery of the survey tool, 350 staff members (42%) declined participation. Subsequent survey requests were made with paper versions and resulted in a higher rate of survey submission. As outlined in the table below, a few surveys were submitted by aides or ancillary staff. The sample of 169 out of 835 total staff members shows an overall response rate of 20% of all staff from participating units. The survey demographics suggest that 100% of preceptors contributed to data collection.

Table 2.
Professional Role Frequency by Unit

Intervention			Control		
Maternal Child Health	RN	42	Maternal Child Health	RN	38
	LVN	2		LVN	4
	Aide	1		Ancillary	1
	Manager	2		Manager	1
	Unknown	1		Unknown	3
	Total Surveys	48		Total Surveys	47
Emergency Department	RN	22	Intensive Care Unit	RN	19
	LVN	2		LVN	1
	Educator	2		Aide	1
				Manager	1
				Unknown	1
	Total Surveys	26		Total Surveys	23
Unknown Unit Designation	RN	4	Unknown Unit Designation	RN	1
	LVN	2		Aide	1
	Aide	1		Ancillary	1
	Unknown	1		Unknown	6
	Total Surveys	8		Total Surveys	9

Discussion of Demographics

The implementation site for this project is a major military medical center accredited as a Level One Trauma Center. The specialty units that experienced the Specialty Nurse Residency intervention included the Emergency Department and two of the six Maternal Child Health (MCH) units within the facility: Post-Partum and Labor and Delivery Units. Preceptors, educators, and managers comprise the target audience for survey responses both before and after implementation of the SNR. Pre-assessment surveys were distributed in September of 2015 and re-survey completed in March 2016. The initial plan targeted implementation in Maternal Child Health, Intensive Care, and Emergency Departments. The Intensive Care units experienced an unexpected lack of administrative support due to personnel changes, thus withdrew from project participation as an intervention unit. Three speciatlies participated as control units; including the ICUs, Ante-Partum and the Neonatal Intensive Care Unit. The survey tool gathered demographic data with expectations of comparison between responses from clinical staff vs. nurse leadership. The make-up of each demographic group was analyzed to ensure comparable group make-up with consideration of sub-group divisions based on submitted demographics.

Once data was compiled and cleaned, the sub group of surveys from manager or educator respondents was too small to allow an analysis contrasting responses from that group with those from clinical staff. The professional roles identified within the participating unites were: 126 Registered Nurses; 11 Licensed Vocational Nurses; and 24 aides, others, or unknown. Years of experience was reported as: 22 (14%) with less than 1 year; 80 (50%) with 1-3 years; 43 (27%) with greater than 4 years; and 15 (9%) of respondents not answering the question.

A significant finding within reported demographics relates to preparation for the preceptor role. Despite most healthcare agencies using trained preceptors for development of new staff and students, only 77 (48%) of all clinical staff reported having received any preceptor education. The majority reported no preceptor development despite preceptor courses offered as a component of the nurse residency intervention. This preparation status contrasts with the data on how many have precepted in the past. Only 52 (32%) of respondents reported not having filled a preceptor role. This leaves 68% that are expected to fill the role, a percentage of who engage in the role without the benefit of instruction in role components, process or documentation tools.

Years of work in specialty was compared with role as a preceptor. Significant demographics include the fact that 11 (50%) of those reporting less than a year of practice in the specialty area also report being assigned as a primary preceptor. This is a case of advanced beginner level staff members being assigned in a preceptor role for new or novice level staff. This practice may warrant further exploration to determine challenges, barriers, and success of such pairing.

Research Question

The PICOT question for this implementation project is: Are the outcomes of the Specialty Nurse Residency reproducible in specialty units other than the Burn ICU (Robbins, 2014), as evidenced by preceptor and educator feedback with comparison of survey responses before and after program implementation? The Specialty Nurse Residency intervention offers support and instruction during the crucial transition period. The intervention engages new-to-specialty nurses within an evidence-based support system that validates competence and development of clinical reasoning skills. Evaluation of the intervention is based on data analysis

from pre and post-intervention survey responses and comparison between intervention and control group data. This will allow testing of the null hypothesis that there will be no significant difference in aggregate scores before vs. after the intervention between the intervention and control groups.

This quantitative, descriptive study solicits feedback from unit staff and leadership to determine if there is a significant difference between pre and post survey scores for the specialty practice settings. The primary variables in this study include a two-level categorical independent variable of pre and post intervention survey results and a continuous dependent variable of aggregate scores on the Workplace Support instrument. This analysis plan limits the potential conclusions to retention or rejection of the null hypothesis, whereas the overall project seeks to determine whether the efficacy of the program used in the original pilot project can be replicated in other specialty units. Additional metrics were used with the original study and may be required to evaluate the efficacy of the SNR program overall.

Data Analysis

First, the data were split between control and intervention responses, thus creating responses unique to each group. Data analysis obtained descriptive statistics for the variables and assessed the total survey score variable for normality. The histogram produced by the aggregate scores from the Workplace Survey instrument does not meet expectations for a symmetrical, bell-shaped curve with the greatest frequency of scores in the middle and smaller frequencies towards the extreme values or ends of the curve (Pallant, 2013). Within-group analysis for normal distribution, Kolomogorov-Smirnov confirms violation of the assumption of normality with Sig. values less than .05 for both the control (*Sig.* = .009) and intervention (*Sig.* = .001) groups.

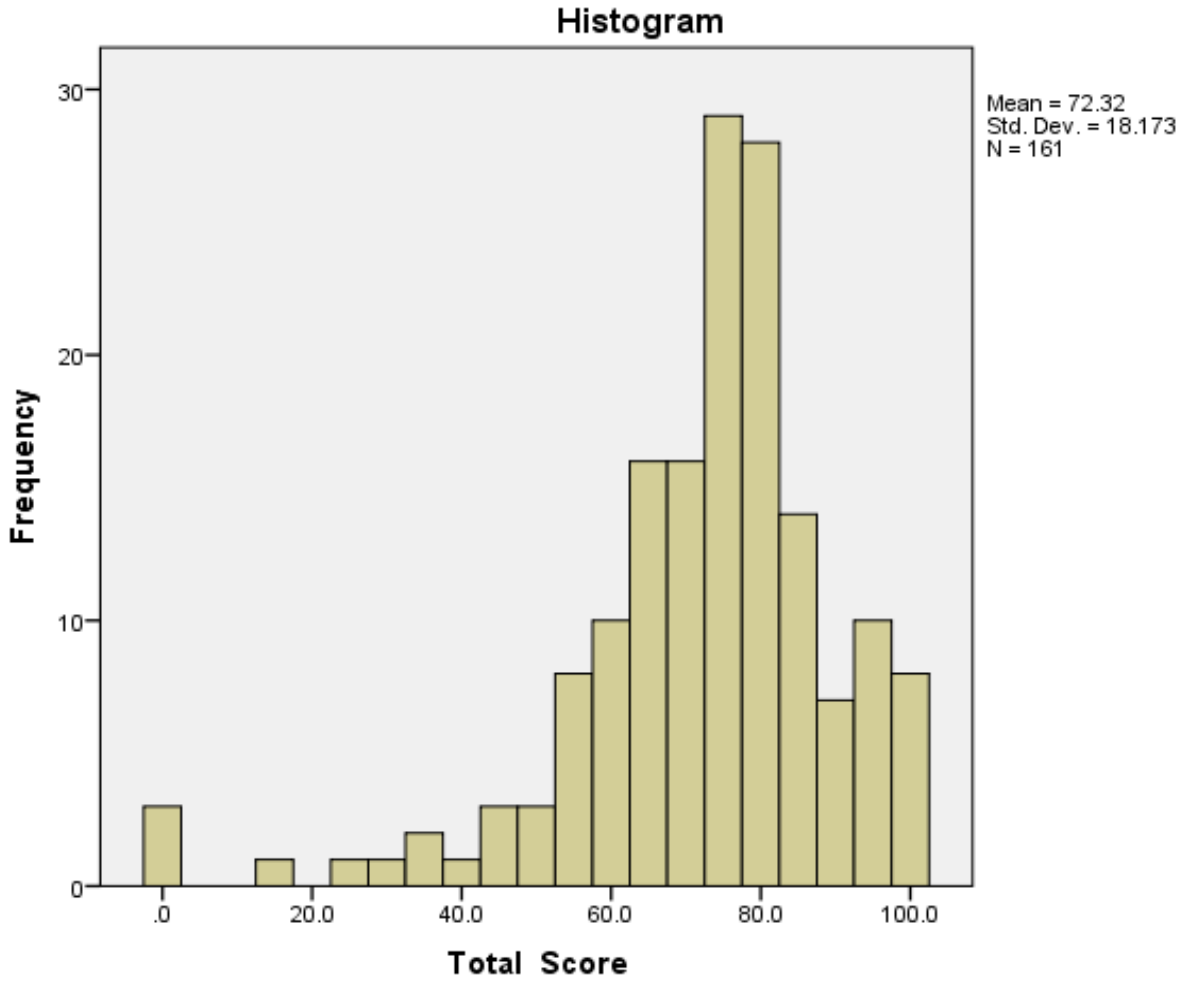

Figure 3. Histogram of aggregate scores from submitted surveys

Once data was explored for normal distribution, the need for alternative test analysis was determined. The Mann-Whitney U Test is a non-parametric solution for comparing groups to determine if the null hypothesis can be rejected, based on whether the degree of difference shows a significant effect. Cronbach's alpha completes the item analysis to measure the internal consistency of the Workplace Support Survey scale and how closely related the set of items are as a group. The results add to the data reporting on the reliability of the tool for measuring the intended aspects of workplace systems of competency development. Due to diversity in

workload and expectations from one unit to another, Anova One Way was used to analyze and compare outcomes across individual units. The data set was shifted to include only the responses with specific unit location designation. This analysis shifted the focus from Total Score per survey, to average score.

The Mann-Whitney U Test revealed no statistically significant difference in the total survey score pre vs post intervention for either the control or intervention group. The median scores for the control group shifted from pre assessment (*Md* = 79, *n* = 48) to post intervention (*Md* = 77.5, *n* = 30, *U* = 704.5, *z* = -.106, *p* = .87. Further analysis results show a small but specific trend in median scores for the intervention group, from pre intervention (*Md* = 74.0, *n* = 52) to post Specialty Nurse Residency intervention (*Md* = 76.7, *n* = 28), *U* = 589.5, *z* = -1.39, *p* = .162, *r* = .155. The r value of greater than .1 suggests the possibility of a small effect size of difference, although non-parametric analysis interprets the analysis outcomes as having no meaningful change.

The one-way between-groups analysis of variance was conducted to explore the impact of individual unit designation on average scores, as measured by Workplace Survey item responses. The data was split by Pre Assessment vs Post Intervention and then divided by unit designation. Surveys with no unit designation were not included in this analysis. There was no statistically significant difference at the $p < .05$ level in the average scores for the four groups as divided pre and post intervention, and control vs intervention group.

Table 4.
Oneway Descriptive Data

TimePoint	n	Mean	Standard Deviation	Standard Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Mini-mum	Maxi-mum
Pre Assessment								
ED-Intervention	18	3.73	0.61	0.14	3.42	4.03	2.40	4.80
MCH-Intervention	27	3.39	0.89	0.17	3.04	3.74	1.00	5.00
MCH-Control	31	3.83	0.69	0.12	3.58	4.09	1.79	5.00
ICU-Control	8	3.82	0.56	0.20	3.34	4.29	3.20	4.90
Total	84	3.67	0.75	0.08	3.50	3.83	1.00	5.00
Post Intervention								
ED-Intervention	8	4.08	1.13	0.40	3.14	5.03	1.70	5.00
MCH-Intervention	20	3.72	0.67	0.15	3.41	4.03	2.00	5.00
MCH-Control	15	3.97	0.57	0.15	3.66	4.29	3.21	5.00
ICU-Control	15	3.83	0.56	0.14	3.52	4.14	2.75	4.70
Total	58	3.86	0.69	0.09	3.68	4.05	1.70	5.00

Note. n=number of participants.

Although the results are not statistically significant, a small trend of positive change is found in the intervention units as illustrated in the chart (Figure 4). The ICU control unit showed almost no change although the control units on MCH did show some increase from pre to post assessment. The degree of change seen in both intervention units is more suggestive than the change within any control unit.

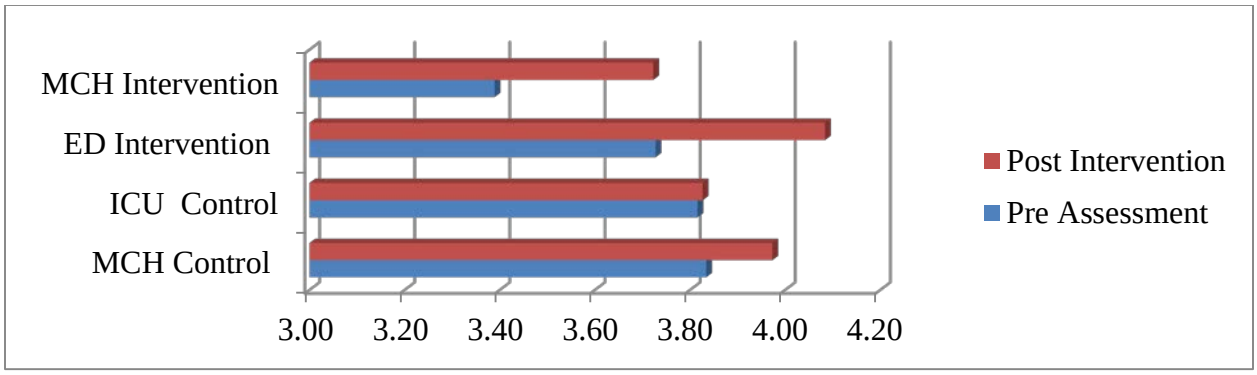

Figure 4. Chart of Pre to Post Assessment Average Scores Changes: Intervention and Control

The survey included a specific yes-no question as to whether the program was an improvement over the prior system for transition to practice. The study was conducted over a period of several months and there were 28 post surveys submitted by those involved in the intervention. Fourteen respondents affirmed the program as an improvement, while less than half that number, six (6) denied enhancement. Eight surveys had no answer on the item, which might indicate that they had no experience with the previous model for orientation to new specialty and some surveys included a comment of “undecided”.

The change from pre to post intervention scores is best portrayed in a chart of direct comparisons for each survey item as shown in Figures 5 & 6. The control group shows a higher starting assessment and less consistency in the overall patterning of responses. Within the control group responses, many items show improvement with the follow-up assessment, but few items show a consistent change pattern. The most significant improvement is seen in item 14 which states, “A safe learning environment exists for all staff”. The next highest improvement is rated for number one (1) “new staff competency development is effective and systematic”. As the data is reviewed, one must keep in mind that some of the control group units were selected due to having a pre-existing, strong, effective transition program in place. The positive impact of

the existing program is diagrammed within the completed surveys, in both pre and post assessment periods, but it is unclear why this large degree of difference would be seen between pre and post intervention.

With the survey tool stating the word “maybe” above the number three (3) and “strongly agree” above five (5), the numerical score communicates the degree to which staff concur that an item is met. The question of why a difference in score is seen in this situation remains. Of importance, is the fact that eight items in the pre assessment of the control group achieve a score that meets or nearly meets the score of four (4), which indicates “agree”.

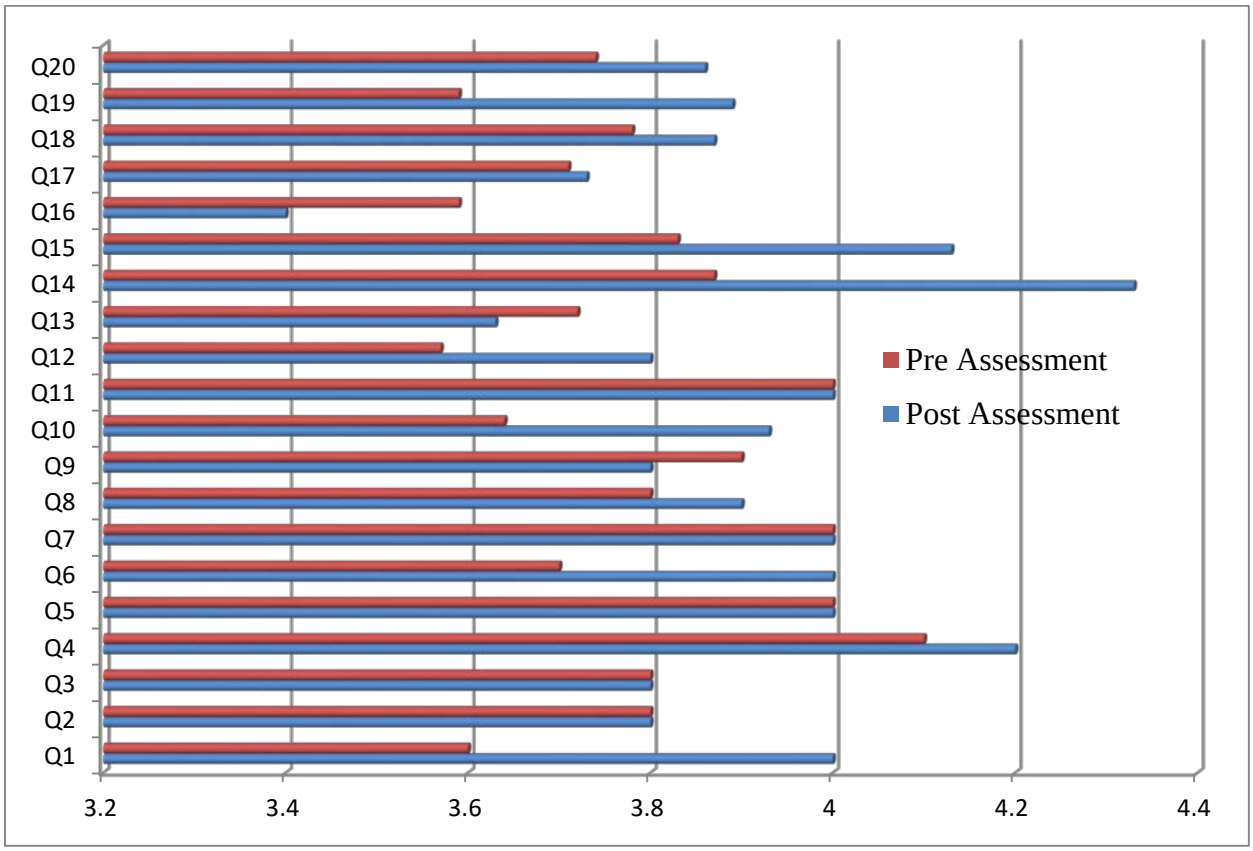

Figure 5. Control Group Units: Difference in Scores from Pre to Post Assessment Surveys

The pre assessment scores within the intervention group are clearly lower than those found in the control group. There is only one item that ranks above a score of four within the

intervention group pre assessment. This is the crucial item that states, “A high level of ‘caring’ is evident within patient care delivery”.

In diagramming responses, there is a specific indication of positive change from pre assessment to post intervention surveys. Illustrated within the Figure 6 chart, the improvement is marked within the intervention group with several survey items showing noteworthy increase. The items rating the greatest improvement post intervention identify higher scores in items related to competency development, communications, conflict management, critical thinking growth, teamwork and support for patient safety. The impact of the intervention is revealed in the fact that scores on 15 out of 20 items achieve a score at or above the level of 3.8, whereas pre-assessment scores show an average score below 3.6.

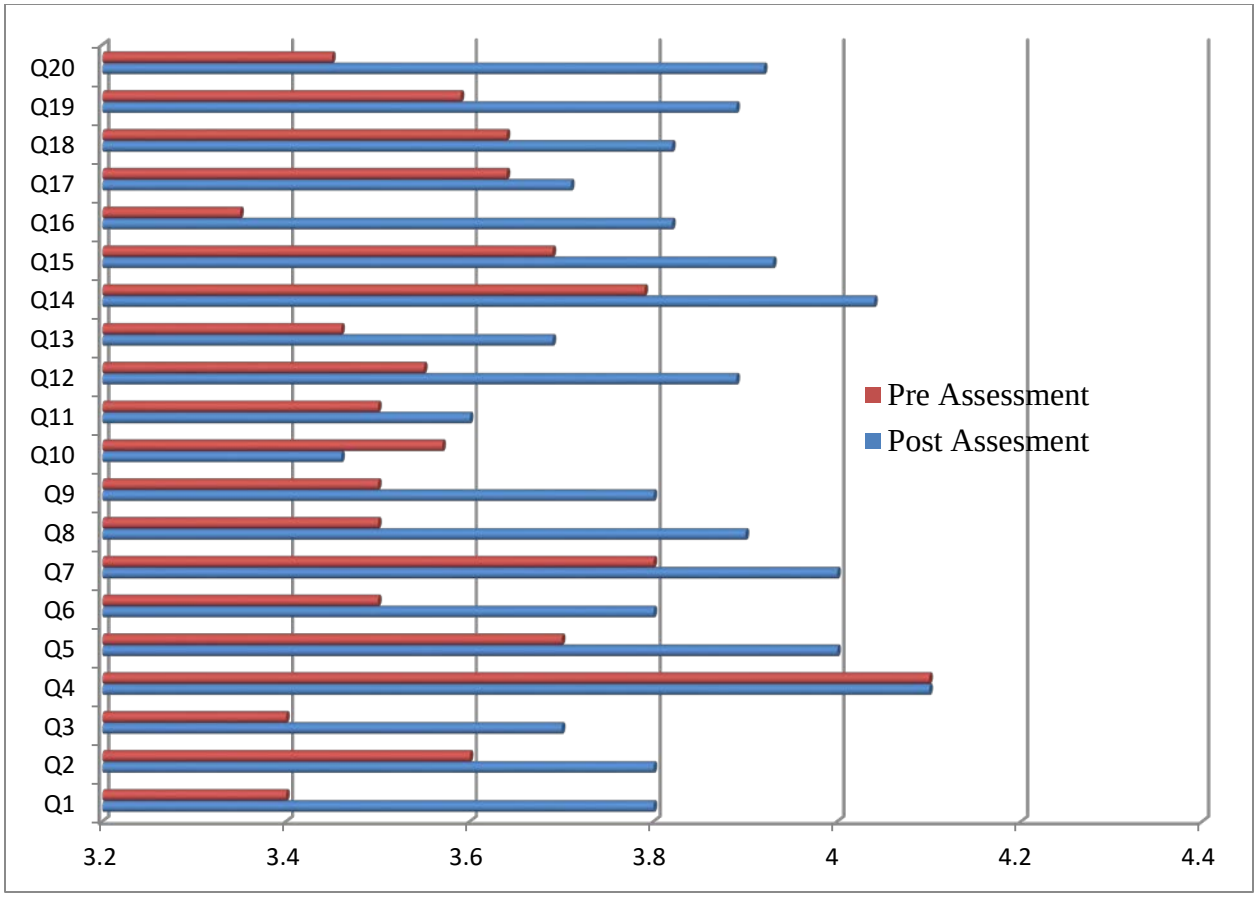

Figure 6. Intervention specialty Units: Difference in scores from pre to post surveys

The Workplace Satisfaction Survey Tool items rating the greatest degree of change in pre to post score are those numbered 1, 5, 8, 12, 15, 16, 19, and 20 (see Appendix A). This denotes improvement in effective and systematic staff competency development, preceptors that are prepared for their role, and communication and conflict issues handled effectively. Improved item scores support the protection of patients from errors through orientation content/process/ delivery, improved teamwork and medical staff communications.

The item with the greatest score improvement states, "Pre-developed teaching/ competency development plans make the preceptor role easier to implement". This item speaks to the use of clinical coaching plans as individualized teaching plans that guide the process for new hire and preceptor. Out of twelve comments specific to the coaching plans, eight gave positive feedback pertaining to their role and function, while four comments reserved opinion or stated they were not used. The participant comment, "helps shape the nurse & develop critical thinking" was a recurring theme within the responses.

Reliability/Validity

According to Hagman and Winstead-Fry (2009), the Workplace Satisfaction Survey tool has strong internal consistency, with a Cronback alpha coefficient reported of .96. In the current study, analysis for reliability statistics produces a Cronbach alpha coefficient of .97. Factor analysis was used in the original study of the Workplace Survey tool, as there were no other comparable scales to administer. The current literature search did not reveal any additional, comparable scales which might be suitable for comparison in today's healthcare environment.

The fact that SNR delivery may be impacted by adequacy of staffing and surges in admission rates is a design weakness. Limitations of the study include sample restrictions,

budgetary issues related to time for preceptor training or access, availability of selected patient diagnoses for experiential learning, and individual biases revealed within the survey responses. A threat to validity in this study is the use of a single, dated tool for data collection. The Workplace Satisfaction Survey is a tool that is specific to the work of the VNIP Internship project, but was developed and validated six years ago. The current SNR model includes program components and tools that were not specifically considered at that time, thus the assessment tool offers a risk of gaps in data as pertains to current program efficacy.

The reliability and validity of this study may have suffered from study fatigue. Miller and Aharoni (2015) report on a significant trend of study fatigue within the military. Survey burden is experienced across the full realm of healthcare, but may be more prevelent within the structured military medical system (Olson, 2014; Smith, 2012). The study was conducted through the Institute of Surgical Research, which is a research branch of the military medical system at the medical center. With research studies as a constant and recurring theme that creates the evidence-based foundation of practice, staff members are subject to survey completion on an ongoing basis. Agency staff also report a phenomena described as *pencil whipping*, wherein staff will complete the form without truly reading and evaluating the items (Kretschmer, 2015; Rauschelbach, 2013). It is possible that this occurred in some instances with the current survey tool and project data collection (Wong & Gerras, 2015).

Conclusion

In summary, the survey gathered data from 169 respondents. Data cleaning required elimination of eight (8) of those surveys, leaving a total of 161 for descriptive, comparative data analysis. This comprises a 20% response rate when considering the total staff numbers comprising the potential survey population. The demographic makeup of the respondant groups

has been outlined and analyzed for any factors that might influence the overall scores. Cronbach's alpha confirmed the validity of the survey tool with a high reliability rating. Anova One-Way analysis was used to gather further detail from one group of units to another. The outcomes confirmed the finding that there is no statistically significant difference between groups.

Kolomogorov-Smirnov analysis suggested violation of the assumption of normality of distribution of aggregate scores, thus Mann Whitney U Test provided a non-parametric alternative to the Student t test. While the Mann Whitney U test recommended that the null hypothesis be retained for both control and intervention groups, detailed analysis noted variations in median aggregate scores. While there is no statistically significant difference in scores from one group or time to another, the trends within scores of the intervention group may be of clinical significance.

Chapter Five provides greater detail of the analysis outcomes. Analysis findings are discussed further, identification of next steps and implications for nurse leadership. The final chapter concludes with recommendations for continuing project implementation and evaluation, or not.

CHAPTER 5: DISCUSSION OF FINDINGS

Introduction

The Specialty Nurse Residency (SNR) project sought to replicate Burn ICU project outcomes in additional specialty units (Robbins, 2014). Data collection targeted preceptor and educator feedback with comparison of survey responses before and after implementation with both control and intervention groups. Analysis compared totaled scores for all items, median scores for groups at each time-point and changes in average score for each survey item as divided by control and intervention groups.

The outcomes from the SNR study impact nurse leadership through considerations of investment in nurse development and the potential for improving patient outcomes through improved focus on critical thinking skill development. Critical thinking measurement has commonly been absent from traditional orientation tools but is identified as a crucial factor within new nurse development (Benner, Sutphen, Leonard, Day, & Shulman, 2010; Forneris & Peden-McAlpine, 2009; Kaddoura, 2013). The SNR intervention integrated critical thinking development for both preceptor and new hire while initiating the three high end nurse apprenticeships as recommended by Benner, et al (2010).

Data analysis within this study recommended retention of the null hypothesis, as there was no statistically significant difference in aggregate scores for either the intervention or control group units. Analysis of the median aggregate survey scores indicates possible trends that may be of clinical significance. Anecdotal feedback expressed support for the framework and evaluation continues based on factors beyond these survey results. Data from additional metrics must be evaluated before the transferability of positive outcomes can be validated or refuted. This study brings the evaluative process one step closer to a conclusion.

Interpretation of the Findings

Analysis of the demographic data revealed no confounding variables within the make-up of each group or sub-group that was identified from survey responses. With both pre and post surveys completed within the same timeframes, the environmental issues of staffing and patient census fluctuations were consistent between the units targeted for data collection. The absence of confounding variables in the demographics sanctioned limitation of data analysis to comparison of pre and post assessment scores from the involved units. The comparison studied total scores, average scores per survey, and the change in scores as averaged for each survey item or study group.

The sample size was less than that anticipated with a significant portion of unit staff declining to participate in data submission. Although cyber delivery of the tool was recommended by the agency's Education Director, the cover page allowed staff to easily opt out of completing the survey. Paper-based tool delivery methods were much more successful in gaining survey responses. This may be a result of paper surveys being easier to complete within scattered time restraints. A web-based survey requires computer access at the same time that the staff member has open time for completion, whereas a paper tool can be carried or kept available for when time opens up, even for brief periods. The lessons learned from this study include the enhanced response rates secondary to paper surveys, as opposed to web-based delivery systems.

The PICOT question for this project asked whether the outcomes of the Specialty Nurse Residency were reproducible in specialty units other than the Burn ICU as evidenced by preceptor and educator feedback with comparison of survey responses? The statistical analysis recommends retention of the null hypothesis, which concludes that the current sample and process of using the survey results does not provide evidence of significant change. Yet the

analysis data also indicates positive trends that might be significant with a larger sample or in a setting that had no prior exposure to the SNR competency system. The original pilot project that this work seeks to replicate used multiple factor measurements to determine outcomes, whereas this study relied upon a single survey tool. Before a final conclusion on replicability can be made, the outcomes from this project must be considered within the framework of data related to nurse retention, competency tool f, workload or staffing issues, and program support from nurse leadership.

The consistent change diagramed in Figures 4 and 6 (Chapter Four, pp.62 & 64) indicates possible trends of improved scores from pre to post intervention assessment. The changes in all scores must be considered along with recognition of confounding factors due to the agency being exposed to the intervention through the original pilot study and continued use of the model in that specialty. A selection bias may have been introduced as units were chosen for participation that had strong leadership and Clinical Nurse Specialist support. These were also units that already had strong preceptor development and standardized knowledge systems in place.

Inferences about the Important Findings

This study sought to determine the efficacy of a Specialty Nurse Residency (SNR) based on data analysis from preceptor and educator survey responses pre and post-program implementation. The intervention used VNIP's Clinical Transition Framework (CTF) for a specialty practice residency program (VNIP, 2016). Both evidence-based preceptor development and competency validation tools were used within the intervention, which makes the managers, educators, and clinical staff the crucial target audience for evaluating project impact (Mann-Salinas, et al., 2014; Robbins, 2014). The evaluative feedback was gathered via specific item responses as well as anecdotal recommendations written by survey respondents.

While the degree of difference found with the Workplace Support Survey tool is not statistically significant, it shows a small trend towards possible clinical significance within the intervention group. A measurable influence is also noted in the respondent comments and the clear majority response to the query regarding this framework offering an improved methodology for transition of new staff. While the small sample size limits the conclusions that can be drawn, when asked whether the program was an improvement, 70% of those responding selected a "Yes" answer. Participant comments and suggestions add to the data that both supports the positive impact of the project and indicates a need for further data collection and analysis to explore the identified themes and challenges.

Another issue experienced within data collection may have impacted the reported data and outcomes. This project site was a military medical center and the study may be subject to the concept and challenges related to pencil whipping. It is not an issue unique to this setting, but it appears to be well documented within the system (McKeon, 2012; Rauschelbach, 2013; Wong & Gerras, 2015). Pencil whipping impacts survey data when respondents complete the form without reading and considering the actual items. The respondents may circle either what they think the researcher wants to receive, or an easy, quick answer of the same number down through all items. Pencil whipping is apparent in all settings and can impact quality of care in the medical setting when it is used to complete forms. In engaging a literature search on the topic, I found several references to pencil whipping related to training and evaluation of competence, which is the focus of this study (Gualardo, 2014; Kretschmer, 2015). In this case, pencil whipping may have impacted the pre or post-intervention scores on survey items, reducing the validity of quantifiable significance between pre and post survey scores.

On further analysis of Robbin's (2014) study, it was evident that data collection was

achieved via multiple tools. This SNR study used a single survey tool thus limiting the approach for answering the overall question of whether the outcomes can be replicated. While the null hypothesis was subject to being retained or rejected, the Workplace Survey tool addressed only one component of data required for determining the replicability of the Burn Unit outcomes. Several additional aspects of staff satisfaction, competency development process, turnover rates and fiscal impact must be considered to determine the full picture related to the efficacy of the Nurse Residency in supporting transition to specialty practice. Patient safety data is another crucial factor for deciding the value and effectiveness of such undertakings.

If this tool is employed in future studies, the small effect size from this study will be used to properly size the sample. The SNR study contributes to research outcomes even when the outcomes cannot be generalized to other units and agencies. This work augments the multiple studies needed to develop broad data sets that predict outcomes when such models are implemented. There is value in each study, even when sample size is small or the model is unique to a setting. The SNR project will benefit the organization and add to research specific to the role of specialty practice residencies for nurses. The data collection also adds to the validity data supporting use of the Workplace Support Survey tool.

Implications of Analysis for Leaders

The outcomes from the SNR study impact nurse leadership in a dual manner. Nurse leaders must consider the cost of investment in nurse development and the potential for improving patient outcomes by producing nurses that can quickly focus critical thinking skills on patient needs and priorities (Gough & Cameron, 2012). Critical thinking measurement has often been absent from traditional orientation tools but has been identified as a crucial factor within new nurse development (Benner, Sutphen, Leonard, Day, & Shulman, 2010; Forneris & Peden-

McAlpine, 2009; Kaddoura, 2013). The SNR intervention integrates critical thinking development for both preceptor and new hire while initiating the three high end nurse apprenticeships as recommended by Benner, et al (2010).

This study sought to determine the efficacy of a Specialty Nurse Residency (SNR) based on data analysis from preceptor and educator survey responses pre and post-program implementation, in both control and intervention units. The evaluative feedback was gathered via specific item responses as well as anecdotal feedback from survey respondents. Achieved outcomes of the intervention include advanced preceptor support for learning in the clinical environment and improved evaluative feedback pertaining to competency development. Individualized clinical coaching plans have been identified as a strong support for the preceptor and new hire.

While the degree of difference found with the Workplace Support survey tool is not statistically significant, it shows a trend of positive change for the intervention group when median scores are re-examined. This trend may have clinical significance for professional development and patient safety issues. The clear majority response to the query pertaining to improved methodology for transition of new staff also carries measurable impact. Additional data is needed to quantify the full impact of the program, especially in consideration of the man-hour expense involved in program delivery.

The Specialty Nurse Residency Study was conducted as part of a larger change project that is redefining the Competency Assessment Program for the agency and possibly the healthcare system. While the statistical analysis from this study recommends retaining the null hypothesis, there is broader data collection that shows a positive impact of the overall competency program. The program has experienced strong support from both unit and senior

nurse leadership within the facility and has made gains related to improved critical thinking development and concrete competency measurement for new staff members.

The SNR intervention incorporates several factors that were not directly evaluated within this study but have a significant impact on transition. These factors include clearly defined expectations, reduced signature requirements, targeting nurse-unique features of practice, completed documentation of competence, effective goal setting and preceptor to preceptor communications. Each of these factors are components needing consideration within determination of overall program efficacy.

Continued data collection will occur as framework utilization is expanded across the medical center. Additional pilot study data may assist in revealing further details of the impact and benefits of the program, as well as the challenges. Data collection will continue to evolve program structure and tools as the key change agents strive to create an effective, concrete, concise and clear framework that simplifies the work and role of clinical preceptors instead of adding complexity.

Recommendations

Additional data will be collected specific to this intervention through directly surveying nurse leadership from each unit involved in the intervention. The impact and cost of the intervention requires evaluation that considers the quality and content of competency assessment, savings experienced through streamlining the validation process, and a focus on reflective learning and judgement within clinical care. Another measure of program or model success is based on employee record review to determine full documentation of orientation requirements. Supplementary data collection may quantify the incidence of patient safety events before and after intervention. Some data components are protected information that will not be shared

outside the facility and other issues may require several months or even years of evaluation.

Formative data collection and evaluation continues to evolve the model and tools as the quantitative data justifies investment in the intervention. With significant program delivery costs inherent to the process, cost benefit analysis is vital to determine both impact and suitability of structured clinical learning for licensed professionals (Gough & Cameron, 2012). Evaluative studies of the components within the SNR framework are indicated to assist with identifying crucial features and their impact on the program as a whole. Outcomes analysis may move the nursing profession toward establishing model requirements and comparative evaluation tools for transition program delivery and evaluation.

Recommendations for Future Research

Topics that require further examination include the a) role and impact of clinical coaching plans as standardized individual teaching plans, b) patient care implications within clinical learning, and c) impact of model on retention, vacancy rates, and satisfaction with workplace or role. While continuing the quantitative data collection, formative evaluation is recommended to fuel continued evolution of the model, tools, teaching materials, and evaluation process. Further intervention studies are called for within this specific agency as the nurse residency framework is implemented in additional units (Robbins, 2014).

If the model is found to be universally suitable for this agency, pilot studies within other facilities could establish applicability across both varied specialties and multiple sites. This implementation project is a first step towards possible standardization on a single framework for competency assessment that prepare providers for engagement in diverse settings including rapid deployment conditions (Smith, 2012).

Summary

The Specialty Nurse Residency introduces pedagogies that keep learners focused on the patient experience, supports learning the skills of inquiry, and offers performance assessment and research that are based in clinical practice. Each of these program traits are recommendations within the call for a radical transformation of nursing education (Benner, Sutphen, Leonard, Day, & Shulman, 2010). The SNR study targeted the question of whether positive outcomes from the previous study could be replicated in other specialty units. The data analysis clearly supports retaining the null hypothesis, although questions are raised regarding clinical trends within the intervention units. While not statistically significant, the small positive effect found with analysis of both total median scores for the overall survey and scores for individual items indicate the possibility of different outcomes with a larger sample size or unbiased implementation site.

Major study findings reveal a majority of respondents reporting the Specialty Nurse Residency as an improved process over prior experiences. Determination of the efficacy of this intervention requires additional data collection related to cost benefit ratio, competency requirements of the organization or unit, documentation efficacy and impact on patient safety. Further exploration and analysis of project impact is needed both to determine replicability of outcomes and for refining evidence-based content and delivery methods for clinical learning.

For this military medical center, the project is a first step towards a universal framework for competency development and assessment. The full continuum of work might standardize provider preparation for engagement in varied settings including rapid deployment (Smith, 2012). With significant program delivery costs inherent to the process, cost benefit analysis is vital to determine both impact and suitability of structured clinical learning for licensed professionals (Gough & Cameron, 2012).

Recommendations call for additional pilot studies as the intervention is used in other units within the facility. If pilot project analysis across the agency supports the positive influence of the intervention, further pilot projects in similar and then dissimilar agencies are indicated. Future research is indicated to analyze and compare varied program components and their impact on the transition framework as a whole. Cost benefit analysis is essential for justifying integration of specialty residences within essential nurse development and specialty competence validation. This study takes a single step along the road for transforming nurse education. Further research is needed to validate the optimal process and to justify this investment in professional development.

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Appendix A Workplace Support Survey

Consent Form

This study involves an evaluation of the workplace support systems provided for transition to a new specialty practice setting. The study is being conducted by Susan Boyer, a student at American Sentinel University (ASU) and has been approved by the ASU Institutional Review Board and the USAISR Research Regulatory Compliance Division.

The survey will be administered via a web site with multiple layers of security to ensure that all data remain private and secure. Data go directly to the researcher via the password protected survey program. The investigator holds no reporting or employee responsibility within your employing agency.

For the convenience of survey respondents, a paper survey tool is available along with the web-based option. The paper survey tool will be distributed by agency-based research assistants at the beginning of each data collection period. You can request a paper survey by calling the ISR research office.

Respondents are to complete only one survey per person – either the web-based tool or the paper version. The survey is offered via both modalities for your convenience, please do not submit data more than once per data collection period.

Agency-based research assistants will distribute, collect, inform, and remind staff about the survey. Respondents requesting the paper version will receive an addressed envelope with the paper survey tool. The sealed survey envelopes are placed in the agency's internal mail system for delivery to the office of the Institute of Surgical Research, attention: *Transition Program Data Collection*. The survey tools will be gathered by the research assistants and kept in a secure location until they are delivered to the investigator.

Participation in the study typically takes less than 20 minutes and is strictly anonymous. All responses are treated as confidential, but no individual identifying data is collected. Some demographic information is collected to ensure that the intervention and control groups are comprised of similar sets of respondents and to allow for comparison of responses from different roles or units. For reporting purposes, all data will be pooled, shared, and published in aggregate form only.

Your participation in this data collection is voluntary and there is no risk to you in submitting responses. An incomplete survey will be considered withdrawal from the study while completion and submission of the survey implies consent to participate in the study.

This project is engaged as part of the course requirements for Susan Boyer, RN, a student within the DNP program at American Sentinel University. If participants have further questions about this study or their rights, or if they wish to lodge a complaint or concern, they may contact the principal investigator, Susan Boyer at (802) 674-7069, via e-mail at boyer274@mail.com ; or the American Sentinel University Institutional Review Board Coordinator via email at irb@americansentinel.edu ; or the agency Co-Primary Investigator, Dr Elizabeth Mann-Salinas at the USA ISR office - (210) 916-6379.

Do not click on the *continue* link, or complete this survey, if you do not understand, or agree with, these conditions.

Workplace Support Survey

This survey is intended to solicit feedback regarding the impact of your ***current orientation and/or internship*** process, model, and tools on your workplace.

Please evaluate the level of support, instruction & teamwork provided for the development and competence assessment of colleagues, novices, and preceptors.

The responses on this survey are strictly confidential and are intended to assist with identifying "what works well" and "what could be improved" within our current systems. All reports will consist of aggregate data. No individual responses or identifiable data will be shared with any agency, agency staff or individuals.

Demographic Date	**Circle the number that best answers the question – or fill in the blank where indicated.**
What specialty service area do you work in?	□ ICU □ ED □ Mother-Baby □ M/S □ Telemetry □ ORTHO □ OUTPT □ OTHER
Are you working with new hires in the Specialty Nurse Transition Program?	□ Yes □ No
Are you equal to or older than 35 years of age?	□ Yes □ No
Your gender is:	□ Female □ Male
Write in the number of weeks of transition support routinely provided on this specialty unit for nurses that are new to the specialty?	_____ wks
How many years have you worked in this specialty?	_____ yrs
What is the staff position that you hold?	□ RN □ LPN □ Ancillary □ Aide □ Educator □ MD/NP/PA □ Manager □ Other
Have you been assigned as a primary preceptor?	□ Yes □ No
Have you been assigned as an occasional preceptor to fill in for others or provide intermittent support?	□ Yes □ No
Have you participated in at least 8 hours of preceptor instruction?	□ Yes □ No
Did your preceptor instruction occur within the	□ Yes □ No

last 4 years?
Has there been any type of preceptor refresher course or ongoing education in the role? □ Yes □ No

Workplace Support Survey

Circle the number that best describes the situation in your workplace environment

In my opinion . . .	Strongly Disagree		Maybe		Strongly Agree
1. New staff competency development is effective and systematic	1	2	3	4	5
2. New staff function in a capable manner	1	2	3	4	5
3. New hires demonstrate confidence in their practice	1	2	3	4	5
4. A high level of 'caring' is evident within patient care delivery	1	2	3	4	5
5. Competence development occurs as effectively as possible	1	2	3	4	5
6. New staff members feel supported and safe	1	2	3	4	5
7. On this unit, preceptors are willing to precept	1	2	3	4	5
8. Preceptors are well prepared for the precepting role	1	2	3	4	5
9. Critical thinking development occurs with the new hires	1	2	3	4	5
10. Evaluation of competency occurs in measurable manner	1	2	3	4	5
11. Planning occurs related to teaching/learning goals and activities	1	2	3	4	5
12. Communication & conflict management issues are handled effectively	1	2	3	4	5
13. Disciplines outside of nursing are engaged in collaborative initiatives	1	2	3	4	5
14. A 'safe learning environment' exists for all staff	1	2	3	4	5
15. Orientation content/process/delivery protects patients from errors	1	2	3	4	5
16. Written teaching or clinical coaching plans play a significant role in guiding the transition program.	1	2	3	4	5
17. Pre-developed teaching/competency development plans make the precepting role easier to implement	1	2	3	4	5
The current "orientation process" is successful in improving:					
18. Recruitment & retention of new staff	1	2	3	4	5
19. Teamwork with allied health providers	1	2	3	4	5

20. Communications with medical staff	1	2	3	4	5

21. Please describe the impact of clinical coaching or teaching plans within the transition program.

22. Based on past experience, is this transition to practice program better than your previous experiences?

☐Yes ☐No

Comments

VNIP contact info: 802-674-7069 or
sboyer@vnip.org

Appendix B Copyright Permission for Workplace Survey Tool

289 County Road, Windsor, VT 05089
802-674-7069 office@vnip.org

Jill Lord
President, Board of Directors
VT Nurses in Partnership, Inc.
289 County Road
Windsor, VT 05089
March 30, 2015

Susan Boyer
274 Cascade Falls Road
Perkinsville, VT 05151

Dear Susan,

As the president of the Board of Directors of Vermont Nurses in Partnership (VNIP), I am writing this letter to formalize your permission to use the survey tool titled Workplace Impact Survey. You have permission to utilize, print, copy, distribute, modify, and use the tool electronically. VNIP developed and validated the tool for use in evaluating transition to practice program delivery. You will find the specific validation and reliability assessment data posted on the VNIP web site – http://www.vnip.org/resources.html.

The VNIP copyright statement must remain on the tool or any derivative form of this survey tool that you develop. The VNIP Board of Directors requests a copy of any study outcomes or dissemination articles that result from this work, along with permission to link them on the VNIP web site.

Sincerely,

Jill M. Lord RN

Jill M. Lord

Appendix C IRB Approval

AMERICAN SENTINEL UNIVERSITY

July 29, 2015

Susan Boyer
DNP Student
American Sentinel University

Re: Impact of nurse residency program on transition to specialty practice

Dear Ms. Boyer:

On July 29, 2015, the American Sentinel University Institutional Review Board reviewed the research proposal entitled "Impact of nurse residency program on transition to specialty practice." The purpose of this project is to evaluate the efficacy of a specialty nurse residency program. The contingencies have been addressed and the IRB **approves** the protocol. Work on this project may begin. This approval is for a period of one year from the date of this letter and will require continuation approval if the research project extends beyond **July 29, 2016**.

If you make changes to the protocol during the period of this approval, you must submit a revised protocol to the American Sentinel University IRB for approval before implementing the changes.

If you have any questions regarding the IRB's decision, please contact me through irb@americansentinel.edu.

Sincerely,

B. F. Petrie, Ph.D.
Chair,
American Sentinel University IRB

c Eddie Beard - Chair

Appendix D Sample Clinical Coaching Plan

Vermont Nurses In Partnership Date Orientee

Weekly Conference Form

- **Daily** - *start the day with establishing goals and expectations with the new hire. Move from Simple to Complex.*
- ***Recap what happened the previous day***. Emphasize the successes of the novice and encourage their development of critical thinking skills
- ***Each day, review the charting and computer skills of the new hire***. Assure that care delivery routine is conducive to protecting the safety, complete care, and accurate documentation of the unit's busy flow of patients.
- ***Update the checklist daily***, meet with the educator as needed to discuss goal achievement, include coach/manager if indicated.

Manages care of multiple patients while integrating special care issues specific to unit

Teaching/Learning Guide and Resource	
Review protocols and/or learning modules related to: medication administration, heparin protocol, chest pain protocol & EKGs, special meds, dosage calculations, and drips; end of life issues; ethical issues; isolation procedures; pre-post op care; population-specific concerns Observes preceptor providing care to special needs patient	Attends Ethics and Discharge Planning committees Assists with care of patient on isolation precautions Observes in OR to learn clean vs sterile technique & mngt. Assignment of multi-patient workload along with special care issues commonly seen on unit

Performance outcomes - expected performance to be validated	**Comments, concerns, issues**	**Achieved Date/Init**
Coordinates care of multi-patient assign		
Prioritizes medication administration & treatments		
Adapts to changing needs and workload to include special care needs commonly seen on unit of hire		
Explains differences between transmission modes for infectious agents		
Adheres to clean and sterile asepsis as appropriate for intervention		
Provides pre and post-operative care and interventions		
Integrates medical technology in care delivery (equipment & computers)		
Uses equipment that is validated as effective for age and weight range of specific patient		
Manages special care issue seen on the unit – i.e. chest pain, heparin, isolation precautions, special wound care, etc. ***(insert comment to denote those that apply)***		

Describe positive experiences, work, accomplishments that occurred this week. Why were they positive?

Describe any challenging or difficult experiences or work that has occurred. What might have been done differently?

VNIP contact info: 802-674-7069 or sboyer@vnip.org

Appendix E Letter of Support - E. Mann-Salinas, PhD, RN, FCCM

DEPARTMENT OF THE ARMY
U.S. ARMY INSTITUTE OF SURGICAL RESEARCH
3650 CHAMBERS PASS STE B
JBSA FORT SAM HOUSTON, TEXAS 78234-7767

20 March 2015

REPLY TO
ATTENTION OF

Ms. Susan Boyer
Executive Director, VT Nurses in Partnership
289 Country Road
Windsor, VT 05089

RE: Letter of Support for proposed project, "Impact of Nurse Residency Program on Transition to Specialty Practice"

Dear Ms Boyer:

This letter is to confirm my participation as site Principal Investigator and subject matter expert on the proposed evidence-based practice project entitled, "Impact of Nurse Residency Program on Transition to Specialty Practice". Throughout the project period, I will provide approximately 5% effort.

I understand my responsibilities to include the assisting with project design, planning for implementation of the project, and data collection and analysis. I will also assist with the preparation of interim and final reports and manuscripts generated by this project.

I look forward to serving as part of your project team. I believe that my skills and expertise in transition in specialty practice will add to the quality of your team. Thank you for inviting me to participate in this important endeavor.

Elizabeth A. Mann-Salinas, PhD, RN, FCCM
LTC, US Army
Systems of Care for Complex Patients
US Army Institute for Surgical Research
JBSA Fort Sam Houston, TX 78234

Appendix F Determination Letter

DEPARTMENT OF THE ARMY
U.S. ARMY INSTITUTE OF SURGICAL RESEARCH
3698 CHAMBERS PASS, STE B
JBSA FORT SAM HOUSTON, TEXAS 78234-7767

REPLY TO
ATTENTION OF

MCMR-SRA-R 4 May 2015

MEMORANDUM FOR RECORD

SUBJECT: Determination for the Project, "**Impact of Nurse Residency Program on Transition to Specialty Practice**," submitted by LTC Elizabeth Mann-Salinas, RN, PhD, US Army Institute of Surgical Research, JBSA Fort Sam Houston, TX 78234, USAISR Log Number PI-15-011

1. The Performance Improvement project description received in the US Army Institute of Surgical Research (USAISR) Research Regulatory Compliance Division (RRCD) on 28 April 2015 with revisions through 30 April 2015 has been reviewed for applicability of human subjects protection regulations.

2. The purpose of this project is to create a Specialty Nurse Residency (SNR) Program to transition novice nurses into specialized practice and evaluate its success based on data analysis from experienced practitioner survey responses post-program implementation. The Burn Center already has an SNR Program and this project will modify this program and reproduce it within other non-burn specialty departments such as the BAMC emergency department, intensive care units and maternal child unit. The Burn Center program will be augmented with unit-specific coaching plans that address the unit-specific nursing competencies. Results of satisfaction survey and retention rates will be compared with the historical Burn Center rates and with BAMC specialty units that do not implement the SNR Program.

3. This project is not designed to contribute to generalizable knowledge and does not constitute research as defined in 32 CFR 219.102(d).

4. The use of PHI for this project is considered to fall into the area of "healthcare operations" which is one of the areas for which HIPAA authorization or the specific waiver of authorization is not required. PHI use in this project is consistent with healthcare operations because the intended outcome of analysis of data gathered for the project is to inform, teach and recognize aspects of healthcare specific to the BAMC specialty units.

5. The project may proceed as described, pending approval of the USAISR Commander.

SUBJECT: Determination for the Project, "**Impact of Nurse Residency Program on Transition to Specialty Practice**," submitted by LTC Elizabeth Mann-Salinas, RN, PhD, US Army Institute of Surgical Research, JBSA Fort Sam Houston, TX 78234, USAISR Log Number PI-15-011

RYAN.KATHY.L.1239580919

Digitally signed by: RYAN.KATHY.L.1239580919
DN: CN = RYAN.KATHY.L.1239580919 C = US O = U.S. Government OU = DoD
Date: 2015.05.04 14:14:05 -05'00'

Kathy L. Ryan, Ph.D.
Human Protections Administrator
Research Regulatory Compliance Division

Appendix G Command Approval

DEPARTMENT OF THE ARMY
U.S. ARMY INSTITUTE OF SURGICAL RESEARCH
3698 CHAMBERS PASS, BLDG 3611
JBSA FORT SAM HOUSTON, TEXAS 78234-7767

REPLY TO
ATTENTION OF

MCMR-SRA-R

4 May 2015

MEMORANDUM FOR Elizabeth Mann-Salinas, LTC, AN, United States Army Institute of Surgical Research, JBSA Fort Sam Houston, Texas 78234-7767

SUBJECT: Command Approval of Project for "**Impact of Nurse Residency Program on Transition to Specialty Practice**," submitted by LTC Elizabeth Mann-Salinas, RN, PhD, US Army Institute of Surgical Research, JBSA Fort Sam Houston, TX 78234, USAISR Log Number PI-15-011

1. The USAISR Research Regulatory Compliance Division (RRCD) reviewed your project on 28 Apr 2015 with revisions through 30 Apr 2015 and determined that it does not constitute research as defined in 32 CFR 219.102(d).

2. You may begin work on the project.

MICHAEL D. WIRT
COL, MC
Commanding

Appendix H CRADA between ASU and US Army Institute of Surgical Research

A COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT

Between

American Sentinel University
Aurora, CO 80014
("ASU")

and

U.S. Army Institute of Surgical Research
JBSA Fort Sam Houston, Texas 78234-7767
("USAISR")

Article 1. Background

1.00 This Agreement is entered into under the authority of the Federal Technology Transfer Act of 1986, 15 U.S.C. 3710a, et seq., between ASU and the USAISR, the parties to this Agreement.

1.01 USAISR, on behalf of the U.S. Government, and ASU desire to cooperate in research and development on **Impact of Nurse Residency Program on Transition to Specialty Practice** according to the attached Statement of Work (SOW) described in Appendix A. NOW, THEREFORE, the parties agree as follows:

Article 2. Definitions

2.00 The following terms are defined for this Agreement as follows:

2.01 "Agreement" means this cooperative research and development agreement.

2.02 "Invention" and "Made" have the meanings set forth in Title 15 U.S.C. Section 3703(7) and (8).

2.03 "Proprietary Information" means information marked with a proprietary legend which embodies trade secrets developed at private expense or which is confidential business or financial information, provided that such information:

(i) is not generally known, or which becomes generally known or available during the period of this Agreement from other sources without obligations concerning their confidentiality;

(ii) has not been made available by the owners to others without obligation concerning its confidentiality; and

(iii) is not already available to the receiving party without obligation concerning its confidentiality.

(iv) is not independently developed by or on behalf of the receiving party, without reliance on the information received hereunder.

2.04 "Subject Data" means all recorded information first produced in the performance of this Agreement.

2.05 "Subject Invention" means any Invention Made as a consequence of, or in relation to, the performance of work under this Agreement.

Article 3. Research Scope and Administration

3.00 Statement of Work. Research performed under this Agreement shall be performed in accordance with the SOW incorporated as a part of this Agreement at Appendix A. It is agreed that any descriptions, statements, or specifications in the SOW shall be interpreted as goals and objectives of the services to be provided under this Agreement and not requirements or warranties. USAISR and ASU will endeavor to achieve the goals and objectives of such services; however, each party acknowledges that such goals and objectives, or any anticipated schedule of performance, may not be achieved.

3.01 Review of Work. Periodic conferences shall be held between the parties for the purpose of reviewing the progress of work. It is understood that the nature of this research is such that completion within the period of performance specified, or within the limits of financial support allocated, cannot be guaranteed. Accordingly, all research will be performed in good faith.

3.02 Principal Investigator. Any work required by the USAISR under the SOW will be performed under the supervision of Dr. Elizabeth Mann-Salinas (Systems of Care for Complex Patients, US Army Institute of Surgical Research, 3698 Chambers Pass, JBSA Fort Sam Houston, Texas 78234-7767, 210-916-6379, FAX 210-539-8522, elizabeth.a.mannsalinas.mil@mail.mil), who, as co-principal investigator has responsibility for the scientific and technical conduct of this project on behalf of the USAISR. Any work required by ASU under the SOW will be performed by Susan Boyer, M.Ed., RN, ASU student enrolled in DNP program (274 Cascade Falls Road, Perkinsville, VT 05151, 802-263-9398, sboyer@vnip.org) who, as co-principal investigator has responsibility for the scientific and technical conduct of this project on behalf of ASU and who is under the educational supervision of Dr. Judy Burckhardt (2260 S. Xanadu Way, Aurora, CO 80014, 303-557-9948, Fax: 866.505.2450, judy.burckhardt@americansentinel.edu).

3.03 Collaboration Changes. If at any time the co-principal investigators determine that the research data dictates a substantial change in the direction of the work, the parties shall make a good faith effort to agree on any necessary change to the SOW and make the change by written notice to the addresses listed in section 13.04 Notices.

3.04 Final Report. The parties shall prepare a final report of the results of this project within six months after completing the SOW.

Article 4. Ownership and Use of Physical Property

4.01 Ownership of Materials or Equipment. All materials or equipment developed or acquired under this Agreement by the parties shall be the property of the party which developed or acquired the property, except that government equipment provided by USAISR (1) which through mixed funding or mixed development must be integrated into a larger system, or (2) which through normal use at the termination of the Agreement has a salvage value that is less than the return shipping costs, shall become the property of ASU.

4.02 Use of Provided Materials. Both parties agree that any materials relating to them which were provided by one party to the other party will be used for research purposes only. The materials shall not be sold, offered for sale, used for commercial purposes, or be furnished to any other party without advance written approval from the Provider's official signing this Agreement or from another official to whom the authority has been delegated, and any use or furnishing of material shall be subject to the restrictions and obligations imposed by this Agreement.

Article 5. Financial Obligation

5.00 The parties shall each be individually responsible for funding its own respective researchers throughout this Agreement, including USAISR facilities, salaries, overhead and indirect costs, etc. Each party may determine at its own discretion, the amount of resources, personnel, materials or funds it will devote to the work under this Agreement.

Article 6. Patent Rights

6.00 Reporting. The parties shall promptly report to each other all Subject Inventions reported to either party by its employees. All Subject Inventions made during the performance of this Agreement shall be listed in the Final Report required by this Agreement.

6.01 ASU Employee Inventions. USAISR waives any ownership rights the U.S. Government may have in Subject Inventions Made by ASU employees

and agrees that ASU shall have the option to retain title in Subject Inventions Made by ASU employees. ASU shall notify USAISR promptly upon making this election and agrees to timely file patent applications on ASU's Subject Invention at its own expense. ASU agrees to grant to the U.S. Government on ASU's Subject Inventions a nonexclusive, nontransferable, irrevocable, paid-up license in the patents covering a Subject Invention, to practice or have practiced, throughout the world by, or on behalf of the U.S. Government. The nonexclusive license shall be evidenced by a confirmatory license agreement prepared by ASU in a form satisfactory to USAISR.

6.02 USAISR Employee Inventions. USAISR shall have the initial option to retain title to, and file patent application on, each Subject Invention Made by its employees. The USAISR agrees to grant an exclusive license to any invention arising under this Agreement to which it has ownership to ASU in accordance with Title 15 U.S. Code Section 3710a, on terms negotiated in good faith. Any invention arising under this Agreement is subject to the retention by the U.S. Government of nonexclusive, nontransferable, irrevocable, paid-up license to practice, or have practiced, the invention throughout the world by or on behalf of the U.S. Government.

6.03 Joint Inventions. Any Subject Invention patentable under U.S. patent law which is Made jointly by USAISR employees and ASU employees under the Scope of Work of this Agreement shall be jointly owned by the parties. The parties shall discuss together a filing strategy and filing expenses related to the filing of the patent covering the Subject Invention. If a party decides not to retain its ownership rights to a jointly owned Subject Invention, it shall offer to assign such rights to the other party, pursuant to Paragraph 6.05, below.

6.04 Government Contractor Inventions. In accordance with 37 Code of Federal Regulations 401.14, if one of USAISR's Contractors conceives an invention while performing services at USAISR to fulfill USAISR's obligations under this Agreement, USAISR may require the Contractor to negotiate a separate agreement with ASU regarding allocation of rights to any Subject Invention the Contractor makes, solely or jointly, under this Agreement. The separate agreement (i.e., between ASU and the Contractor) shall be negotiated prior to the Contractor undertaking work under this Agreement or, with the USAISR's permission, upon the identification of a Subject Invention. In the absence of such a separate agreement, the Contractor agrees to grant ASU an option for a license in Contractor's inventions of the same scope and terms set forth in this Agreement for inventions made by USAISR employees.

6.05 Filing of Patent Applications. The party having the right to retain title to, and file patent applications on, a specific Subject Invention may elect not to file patent applications, provided it so advises the other party within 90 days from the date it reports the Subject Invention to the other party. Thereafter, the other party may elect to file patent applications on the Subject Invention and the party

initially reporting the Subject Invention agrees to assign its ownership interest in the Subject Invention to the other party.

6.06 Patent Expenses. The expenses attendant to the filing of patent applications shall be borne by the party filing the patent application. Each party shall provide the other party with copies of the patent applications it files on any Subject Invention, along with the power to inspect and make copies of all documents retained in the official patent application files by the applicable patent office. The parties agree to reasonably cooperate with each other in the preparation and filing of patent applications resulting from this Agreement.

Article 7. Exclusive License

7.00 Grant. The USAISR agrees to grant to ASU an exclusive license in each U.S. patent application, and patents issued thereon, covering a Subject Invention, which is filed by the USAISR subject to the reservation of a nonexclusive, nontransferable, irrevocable, paid-up license to practice and have practiced the Subject Invention on behalf of the United States.

7.01 Exclusive License Terms. ASU shall elect or decline to exercise its right to acquire an exclusive license to any Subject Invention within six months of being informed by the USAISR of the Subject Invention. The specific royalty rate and other terms of license shall be negotiated promptly in good faith and in conformance with the laws of the United States.

Article 8. Background Patent(s)

8.00 USAISR Background Patent(s): USAISR has filed patent application(s), or is the assignee of issued patent(s), listed below which contain(s) claims that are related to research contemplated under this Agreement. No license(s) to this/these patent applications or issue patents is/are granted under this Agreement, and this/these application(s) and any continuations to it/them are specifically excluded from the definitions of "Subject Invention" contained in this Agreement: None.

8.01 ASU Background Patent(s): ASU has filed patent application(s), or is the assignee of issued patent(s), listed below which contain(s) claims that are related to research contemplated under this Agreement. No license(s) to this/these patent applications or issue patents is/are granted under this Agreement, and this/these application(s) and any continuations to it/them are specifically excluded from the definitions of "Subject Invention" contained in this Agreement: None.

Article 9. Subject Data and Proprietary Information

9.00 Subject Data Ownership. Subject Data shall be jointly owned by the parties. Each party, upon request to the other party, shall have the right to review and to request delivery of all Subject Data, and delivery shall be made to the requesting party within two weeks of the request, except to the extent that such Subject Data are subject to a claim of confidentiality or privilege by a third party.

9.01 Proprietary Information/Confidential Information. Each party shall place a proprietary notice on all information it delivers to the other party under this Agreement that it asserts is proprietary. The parties agree that any Proprietary Information or Confidential Information furnished by one party to the other party under this Agreement, or in contemplation of this Agreement, shall be used, reproduced and disclosed by the receiving party only for the purpose of carrying out this Agreement, and shall not be released by the receiving party to third parties unless consent to such release is obtained from the providing party.

9.02 Army limited-access database. Notwithstanding anything to the contrary in this Article, the existence of established CRADAs specifying areas of research and their total dollar amounts may be documented on limited access, password-protected websites of the U.S. Army Medical Research and Materiel Command (the parent organization of USAISR), to provide the Command's leadership with a complete picture of military research efforts.

9.03 USAISR Contractors. ASU acknowledges and agrees to allow USAISR's disclosure of ASU's proprietary information to USAISR's Contractors for the purposes of carrying out this Agreement. USAISR agrees that it has or will ensure that its Contractors are under written obligation not to disclose ASU's proprietary information, except as required by law or court order, before Contractor employees have access to ASU's proprietary information under this Agreement.

9.04 Release Restrictions. USAISR shall have the right to use all Subject Data for any Governmental purpose, but shall not release Subject Data publicly except: (i) USAISR in reporting on the results of research may publish Subject Data in technical articles and other documents to the extent it determines to be appropriate; and (ii) USAISR may release Subject Data where release is required by law or court order. The parties agree to confer prior to the publication of Subject Data to assure that no Proprietary Information is released and that patent rights are not jeopardized. Prior to submitting a manuscript for review which contains the results of the research under this Agreement, or prior to publication if no such review is made, each party shall be offered an ample opportunity to review any proposed manuscript and to file patent applications in a timely manner.

9.05 FDA Documents. If this Agreement involves a product regulated by the U.S. Food and Drug Administration (FDA), then ASU or the U.S. Army

Medical Research and Materiel Command, as appropriate, may file any required documentation with the FDA. In addition, the parties authorize and consent to allow each other or their contractors or agents access to, or to cross-reference, any documents filed with the FDA related to the product. In the event the ASU decides not to continue development or seeking FDA approval or stops commercializing in the US, then the Army has access to all the data/current FDA filings, and a non-exclusive license to any necessary underlying intellectual property.

Article 10. Information Assurance and Data Management

10.00 General. The parties to this agreement acknowledge the importance of maintaining information security and managing the data exchanged hereunder in compliance with all applicable legal authorities. The parties acknowledge that the information exchanged under this agreement is to be afforded the highest degree of protection practicable. The parties further acknowledge that they must balance the need for system capabilities, the protection of personal privacy, the protection of the information being shared, and the protection of the information environment, which includes protection of the other missions and business functions reliant on the shared information environment. In light of these acknowledgements, the parties agree to the terms below.

10.01 Description. The following data will be collected, shared, used or stored in support of this Agreement: human clinical test data. The data described above will be shared in the following ways: e-mail, electronic file transfer, data stored on portable storage devices, and hard copy.

10.02 Personnel Training and Vetting. Both parties are responsible for ensuring that their personnel handling the data described above satisfy all necessary training requirements and obtain any requisite local clearances to handle said data.

10.03 Transmission, Storage, Retention and Interface. Both parties are responsible for ensuring that any data shared is both transmitted and stored in accordance with all applicable legal authorities. Facilities used within the scope of this agreement must meet the same standards as if the research or data collection was conducted by the Government. While in retention, the data will be protected by either of the following: storage within a secure, access-controlled closet, within a project specific storage area network with appropriate algorithms (compliant with Federal Information Publishing Standard (FIPS) Publication 140-2 with a project-specific SAN) to encrypt the data. Parties will ensure that protections exist for any information system used within the scope of this agreement.

10.04 Destruction. Unless agreed to by the parties, this data will be destroyed at the expiration of this Agreement or in the event the Agreement is terminated, whichever occurs first. Data destruction will be conducted in accordance with applicable legal authorities. Each party to this Agreement is responsible for the destruction of the data in its possession.

10.05 Publication. Any publication or public release of data requires review and approval by both signatories of this agreement, by the USAMRMC Public Affairs Office (PAO) and USAMRMC Operational Security before being released.

10.06 Personally Identifiable Information, Personal Health Information, HIPAA. In addition, data containing personally identifiable information (PII), personal health information (PHI) or Health Insurance Portability and Accountability Act (HIPAA) data will be de-identified(by redaction or another equally effective method) by the providing party before being transmitted to the receiving party. The de-identification process includes removal of names, social security numbers, dates of birth, etc., and replacing that information with a new unique identification number (UID) if necessary to use the data as contemplated. The receiving party is responsible for notifying the providing party immediately if data received is not properly de-identified.

Article 11. Termination

11.00 Termination by Mutual Consent. ASU and USAISR may elect to terminate this Agreement, or portions thereof, at any time by mutual consent.

11.01 Termination by Unilateral Action. Either party may unilaterally terminate this entire Agreement at any time by giving the other party written notice, not less than 30 days prior to the desired termination date.

11.02 Termination Procedures. In the event of termination, the parties shall specify the disposition of all property, patents and other results of work accomplished or in progress, arising from or performed under this Agreement by written notice. Upon receipt of a written termination notice, the parties shall not make any new commitments and shall, to the extent feasible, cancel all outstanding commitments that relate to this Agreement. Notwithstanding any other provision of this Agreement, any exclusive license entered into by the parties relating to this Agreement shall be simultaneously terminated unless the parties agree to retain such exclusive license.

Article 12. Disputes

12.00 Settlement. Any dispute arising under this Agreement which is not disposed of by agreement of the principal investigators shall be submitted jointly to the signatories of this Agreement. A joint decision of the signatories or their

designees shall be the disposition of such dispute. However, nothing in this section shall prevent any party from pursuing any and all administrative and/or judicial remedies which may be allowable.

Article 13. Liability

13.00 Property. Neither party shall be responsible for damages to any property provided to, or acquired by, the other party pursuant to this Agreement.

13.01 ASU's Employees. ASU agrees to indemnify and hold harmless the U.S. Government for liability of any kind involving an employee of ASU arising in connection with this Agreement, and for all liabilities arising out of the use by ASU of USAISR's research and technical developments, or out of any use, sale or other disposition by ASU of products made based on USAISR's technical developments, except to the extent the liability is due to the negligence of USAISR under the provisions of the Federal Tort Claims Act. This provision shall survive termination or expiration of this Agreement.

13.02 No Warranty. The parties make no express or implied warranty as to any matter whatsoever, including the conditions of the research or any Invention or product, whether tangible or intangible, Made, or developed under this agreement, or the ownership, merchantability, or fitness for a particular purpose of the research or any Invention or product.

Article 14. Miscellaneous

14.00 Governing Law. The construction, validity, performance, and effect of this Agreement shall be governed for all purposes by the laws applicable to the United States Government.

14.01 Export Control and Biological Select Agents and Toxins. The obligations of the parties to transfer technology to one or more other parties, provide technical information and reports to one or more other parties, and otherwise perform under this Agreement are contingent upon compliance with applicable United States export control laws and regulations. The transfer of certain technical data and commodities may require a license from a cognizant agency of the United States Government or written assurances by the Parties that the Parties shall not export technical data, computer software, or certain commodities to specified foreign countries without prior approval of an appropriate agency of the United States Government. The Parties do not, alone or collectively, represent that a license shall not be required, nor that, if required, it shall be issued. In addition, where applicable, the parties agree to fully comply with all laws, regulations, and guidelines governing biological select agents and toxins.

14.02 Independent Contractors. The relationship of the parties to this Agreement is that of independent contractors and not as agents of each other or as joint venturers or partners.

14.03 Use of Name or Endorsements. (a) The parties shall not use the name of the other party on any product or service which is directly or indirectly related to either this Agreement or any patent license or assignment agreement which implements this Agreement without the prior approval of the other party. (b) By entering into this Agreement, USAISR does not directly or indirectly endorse any product or service provided, or to be provided, by ASU, its successors, assignees, or licensees. ASU shall not in any way imply that this Agreement is an endorsement of any such product or service. Press releases or other public releases of information shall be coordinated between the parties prior to release, except that the USAISR may release the name of ASU and the title of the research without prior approval from ASU.

14.04 Survival of Specified Provisions. The rights specified in provisions of this Agreement covering Patent Rights, Subject Data and Proprietary Information, and Liability shall survive the termination or expiration of this Agreement.

14.05 Notices. All notices pertaining to or required by this Agreement shall be in writing and shall be signed by an authorized representative addressed as follows:

If to ASU:	Melissa Kendall ASU Academic Services 2260 S. Xanadu Way, Aurora, CO 80014
If to USAISR:	U.S. Army Institute of Surgical Research MCMR-SRR-P (Rick Jocz) 3698 Chambers Pass Building 3611 JBSA Fort Sam Houston, Texas 78234-7767

Any party may change such address by notice given to the other in the manner set forth above.

Article 15. Duration of Agreement and Effective Date

15.01 Effective Date. This Agreement shall enter into force as of the date it is signed by the last authorized representative of the parties.

15.02 Signature Execution. This Agreement may be executed in one or more counterparts by the parties by signature of a person having authority to bind the party, which may be by facsimile signature, each of which when executed and delivered, by facsimile transmission, mail, or email delivery, will be an original and all of which will constitute but one and the same Agreement.

15.03 Expiration Date. This Agreement will automatically expire three (3) years from effective date unless it is revised by written notice and mutual agreement.

IN WITNESS WHEREOF, the Parties have caused this agreement to be executed by their duly authorized representatives as follows:

For ASU:

Dr Judy Burckhardt
Dr Judy Burckhardt
DATE 10/30/2015

JUDY BURCHKARDT
Dean of Nursing Programs

For the U.S. Government:

for J. Wirt

MICHAEL D. WIRT
Colonel, US Army
Commanding
U.S. Army Institute of Surgical Research

DATE 9 Nov 2015