5-10-2017

RETROSPECTIVE COMPARATIVE COSTS AND BENEFITS OF REGISTERED NURSES (RNs) IN A PERIOPERATIVE 101 PROGRAM RESIDENCY (P101); AN IMMERSIVE PERIOPERATIVE SPECIALTY RESIDENCY (PSR); AND REGISTERED NURSES HIRED INTO GENERAL PERIOPERATIVE SERVICES FROM 2009-2016

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BY

JOHANNA KATHLEEN STIESMEYER

A Scholarly Project submitted to the Graduate School in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

University of New Mexico
College of Nursing
Albuquerque, New Mexico

Capstone Chair: Dr. P.J. Woods
Capstone Committee Member: Dr. Cynthia Nuttall
Date of Submission: May 2017
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

“Retrospective Comparative Costs and Benefits of Registered Nurses (RNs) In a Perioperative 101 Program Residency (P101); An Immersive Perioperative Specialty Residency (PSR); And RNs Hired into General Perioperative Services from 2009-2016”
a scholarly project prepared by Johanna Kathleen Stiesmeyer, in partial fulfillment of the requirements for the degree, Doctor of Nursing, has been approved and accepted by the following:

UNM COLLEGE OF NURSING

“Retrospective Comparative Costs and Benefits of Registered Nurses (RNs) In a Perioperative 101 Program Residency (P101); An Immersive Perioperative Specialty Residency (PSR); And RNs Hired into General Perioperative Services from 2009 – 2016”

Johanna Stiesmeyer, MSN

PJ Woods, PhD, MBA, RN (Chair)
Cynthia Nuttall, PhD, (Member)
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

ABSTRACT

RETROSPECTIVE COMPARATIVE COSTS AND BENEFITS OF REGISTERED NURSES (RNs) IN A PERIOPERATIVE 101 PROGRAM RESIDENCY (P101); AN IMMERSE PERIOPERATIVE SPECIALTY RESIDENCY (PSR); AND REGISTERED NURSES HIRED INTO GENERAL PERIOPERATIVE SERVICES FROM 2009-2016

BY

JOHANNA KATHLEEN STIESMEYER

University of New Mexico
College of Nursing
Albuquerque, New Mexico
Dr. P. J. Woods, Chair

This study addresses the cost to benefit ratio of a healthcare organization’s investment in specialty perioperative residency programs for newly licensed registered nurses and experienced registered nurse orienting into perioperative services. The outcomes for transition to practice residency programs is widely reported however a standardized approach to measuring and reporting cost to benefit ratios and return on investment to these programs as well as specialty residencies remains an opportunity. This study contributes to national standardization and approach by defining the costs of a perioperative residency program and determining the cost to benefit ratio using a return on investment calculator. The organizational first year investment did not show a positive return but by the second year achieve of a consistently positive financial return was
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

achieved. The average savings in reducing traveler salary costs was $40,923 per onboarding employee with a total savings of $6,343,065.

_Keywords:_ adaptive enterprise, COBRAM ©, newly licensed registered nurses, perioperative nursing residency program, return on investment, transition to practice residency program
DEDICATION

It is with respect and profound gratitude that I dedicate this Doctorate of Nursing Practice Scholarly Project to my parents, Colonel Edward H. Stiesmeyer, D. D. S. and Second Lieutenant Kathryn M. Stiesmeyer, RN. Their devotion to the care of patients framed my motivation to enter nursing and drove my determination to continue their work. Their insight, guidance, advocacy, and humor, guided me into an early introduction to the world of healthcare and into my journey as a nurse, educator, and clinical education director. Both my parents invested early in my healthcare profession by taking me to the University of California, San Francisco to learn how to interpret ECGs as a teenager. They role modeled and taught me the honor and privilege of caring for those we serve. It is because of their compassion and steadfast support that I found my true purpose in life.
Simon Sinek’s The Golden Circle developed by identifies the “Why”, “What” and “How” individuals and/or teams drive their purpose. I profoundly believe that while we can talk about the “What” and “How” we drive our purpose in life, The Golden Circle’s “Why” has the greatest impact. It is the “Why” that drove the” What” and “How” I came to start this journey and complete this program. This acknowledgment captures all the individuals who were so significant in this journey.

With deep gratitude I thank Dr. P. J. Woods for her guidance, support, delightful humor, and enthusiasm. Without her steadfast dedication and expertise this project would not have come to realization. The journey stretched the author’s imagination to limits never expected and the discovery was an amazing process. Many heartfelt thanks!

To Dr. Cynthia Nuttall, I express deep appreciation for her clear advice and insight into this project. Her energy, humor, and expertise are most appreciated.

To Dr. Christine DeLucas, my deepest regard and acknowledgment of your expansive knowledge, your delightful sense of humor, and unfaltering guidance.

To my DNP Cohort, Dr. Manuelita (Mela) Chapman, Dr. Chet Hurley-Doering, Dr. Razvan Preda, and Dr. Joy Stoddard, you are the most amazing group of individuals and friends I have ever had the pleasure of knowing. Our many adventures inspired me, had me laughing with delight, and helped me push through all the challenges.

To Dr. Diane Evans-Prior, your mentorship and amazing support was nothing short of extraordinary. I am so proud to collaborate with you as a colleague and a friend.

To My Clinical Education team who partnered with me to build, deploy, and measure the Perioperative Residency Program, my deepest thanks and appreciation. It is
an honor to work with you. You really make a difference in the care of patients and the team proving the care.

To the Executive Leadership Team, you have my gratitude and appreciation for supporting my journey in this exciting progress. My earnest appreciation!

And to my family, how can I even begin to thank you? Your patience, upbeat presence, steadfast loyalty, humor, and positivity were inspirational and so deeply significant. You were there no matter what; always my champion; always the source of my “Why”!
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<td>AORN</td>
<td>Association of perioperative Registered Nurses</td>
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<tr>
<td>CBR</td>
<td>Cost- Benefit Ratio</td>
</tr>
<tr>
<td>COBRAM</td>
<td>Cost- Benefit Return on Investment Analysis Methodology</td>
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<tr>
<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health Literature</td>
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<td>EBSCO</td>
<td>Elton B. Stephens Company</td>
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<td>FTE</td>
<td>Full Time Equivalents</td>
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<td>HCO</td>
<td>Health Care Organizations</td>
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<td>HR</td>
<td>Human Resources</td>
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<td>IOM</td>
<td>Institute of Medicine</td>
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<td>IRB</td>
<td>Institutional Review Board</td>
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<td>NLRN</td>
<td>Newly Licensed Registered Nurse</td>
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<td>Perioperative Specialty Residency</td>
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<td>Public MEDLINE Database</td>
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<td>RN</td>
<td>Registered Nurse</td>
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<td>ROI</td>
<td>Return on Investment</td>
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<td>TTP</td>
<td>Transition to Practice Programs</td>
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<td>UNM</td>
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CHAPTER 1

INTRODUCTION AND BACKGROUND

Challenges to Filling Critical Staffing Positions

Critical staffing needs challenge healthcare organizations (HCOs) to seek alternative, innovative strategies to fill essential care services. Multifactorial contributors impacting staffing gaps include: expansion of services to meet the community needs by HCOs, a retiring population of registered nurses (RNs), and financial constraints impacted by cost reimbursement for services (Zinn, Guglielmi, Davis, & Moses, 2012). Competitive markets and a decreasingly unavailable experienced nursing workforce contribute to longer staff position vacancy times (NSI, 2016). To prevent disruption in access to services, HCOs incur higher costs necessitated by using agency contractors to fill staffing gaps and staff overtime to fill critical staffing needs.

Financial constraints also challenge HCOs to move from traditional recruitment approaches to building pipelines that attract newly licensed registered nurses (NLRNs) as well as incentivizing experienced nurses to consider new specialties. There is urgency to fill open staffing positions with competent care givers to meet the care needs of the population served by the HCO (Sheffield, 2016; Auerbach, Buerhaus, & Staiger, 2014).

National trends demonstrate NLRNs are the largest source of labor available for recruitment in highly competitive markets with the projected number of NLRNs reaching to over 3.8 million by 2025 (HRSA, 2014; Welding, 2011). A lack of expertise in clinical care and clinical judgement challenge the NLRNs in their ability to provide competent care. Recognizing this need, the Institute of Medicine (IOM) called for general and specialty residency programs to help the transitioning process (IOM, 2011).
Healthcare leadership is experiencing a perfect storm of events that stretch the limits of the HCO in providing competent care and access to services (Letourneau & Fater, 2015). Factors contributing to this challenge include: a nursing shortage environment, higher acuity patient populations, complexities of care and treatments, higher volumes of an aging population, challenging reimbursement programs, and prohibitively expensive traditional residency or orientation programs (Buerhaus, 2008; Goodie, Lynn, McElroy, Bednash, & Murray, 2013).

**Perioperative Staffing Challenges**

Perioperative retirement rates are on track to significantly impact the HCO’s ability to staff services. In a national survey of (N=256) experienced perioperative Registered Nurses (RNs), 37.8% stated they planned to retire by 2018 and by 2022, 64.8% identified that they would be retired (Sherman, Patterson, Avitable, & Dahle, 2014). The gap in experienced perioperative RN staffing services is compounded as the needs for perioperative procedures in increasing in volume (Graling & Rusynko, 2001; Gorgone, Arsenault, Milliman-Richard, & Lajoie, 2016), Sherman, Patterson, Avitable, & Dahle, 2014).

Ball, Doyle, and Oocumma (2015) presented that the demand for perioperative nurses will grow by 1-2% each year and yet that over the next 25 years, it is expected that 20% of the present perioperative RN population will retire (Ruth-Sahd, & Wilson, G., 2013). Wilson (2012) identified that healthcare organizations are challenged by undergraduate curricula removing perioperative rotations thus resulting in a loss of exposure of nursing students to the perioperative environment and consideration of this area as a viable career opportunity. The article addressed the significant challenges
perioperative management is experiencing staffing these services and the increasing complexity of skills sets, technology, and collaborative team approach. Furthermore, these specialized nursing services have a retiring workforce. The costs of recruiting and retaining a perioperative RN may vary from $22,000 to $64,000 per RN while training a nurse to be competent in the perioperative environment may cost up to $59,999 for foundational competencies (Martin, 2011; Mollohan & Morales, 2016). This creates a significant financial strain on the HCO as well as a burden upon staff to precept and cover staffing services. Ball, Doyle, and Oocumma (2015) stated the AORN Perioperative 101 Program produces a reduction in recruitment, orientation and precepting time. No description of the cost saving was identified.

**Strategies to Attract Nursing Students to Perioperative Services**

In 1980, the Association of perioperative Registered Nurses (AORN) championed Project Alpha which provided a forum for dialogue and collaboration between academic and perioperative to partner in integrating a perioperative experience into the nursing curriculum (AORN, 2015). This offered nursing students access to perioperative services during academic coursework, post-graduate courses, and internships afforded a recruitment strategy to this specialty (Gregory, Bolling, & Langston, 2014; Castellucio, 2012). While this is an important framework to increase a perioperative workforce pipeline, it is also important to understand that residency programs are key support programs to create a competent workforce. This point is foundational to the IOM Future of Nursing Report (2010) call for the implementation of nurse residency programs in transition to practice (TTP) programs as well as specialty practices.
Problem Statement

Adapting and responding strategically, healthcare organizations (HCOs) have the opportunity to translate research, implement, and measure return on investment (ROI) for residency programs for newly licensed Registered Nurses (NLRN) entering perioperative services as well as experienced nurses changing specialty. Subsequent exploration measuring program effectiveness through purposeful examination of nurse retention, care competency, and impact upon patient outcomes (IOM, 2010) is necessary to understand to maximize the financial and human capital investment.

This study uses a cost-benefit return on investment (ROI) analysis model titled COBRAM© to quantify recruitment, unit specific hiring, and education cost strategies to attract and retain NLRN and experienced RNs to perioperative services. The COBRAM© is composed of three categories examining overall costs and comparing recruitment, hiring, and education outcomes. The COBRAM© components include: Human Resource (HR), Perioperative Services, and Clinical Education. Each component is broken down into the workflow processes and associated costs.

Figure 1: COBRAM ©
While the national literature calls for HCOs to invest in specialty residency programs there is far less evidence demonstrating the outcomes and ROI of specialty residency programs. While Transition to Practice Residencies (TtP) demonstrates significant impact to effectiveness in building NLRN care competencies, increasing retention, and integrating the NLRN into the HCO and unit, the number of studies demonstrating the outcomes and specialty residency programs’ impact remain an area of opportunity (Zinn, Guglielmi, Davis, & Moses, 2012; Anderson, Hair, Todero, 2012).

In economically challenging times the HCO’s investment in a perioperative residency calls for a process to determine program feasibility, outcomes, and ROI using a standardized process. Measurement approaches vary and include tools measuring the impact of turnover and replacing RNs while other studies focused on calculating a variety of operational costs including hiring, education, vacancy rates, retention, canceled cases, staff satisfaction (Jones, 1992; Jones, 2004; Woods, 2004; Pine & Tart, 2007; Trepanier, Early, Ulrich, & Cherry, 2012; Li & Jones, 2013).

**Study Purpose**

This study introduces a tool that updates previous calculators. The COBRAM© model provides the framework to quantify recruiting, education, and staffing coverage investments for a perioperative workforce in a time of accelerating perioperative workforce retirements and increasing volumes of perioperative cases. The COBRAM© model is adaptable in calculating the cost-benefit ratio and ROI of workforce pipelines.

**Objectives and Goals**

The study involves a retrospective approach to examine outcomes of three groups of registered nurses hired into perioperative services from 2009-2016. The three groups
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include: (1) Group 1- RNs hired into the Periop-101 Program, (2) Group 2- RNs hired into the six-month immersive Perioperative Specialty Residency (PSR), and Group 3- experienced nurses who were not offered, nor chose not to enter either the P101 residency, or the new PSR residency. The objectives and goals of this study include: (1) comparing the differences between the groups in success in completing the on-boarding program, (2) measuring the retention of the groups’ participants six and twelve months post hire, (3) building the COBRAM © and testing the model as a return on investment calculator, and (4) providing a standardized model that appreciates the costs of filling open positions and aids in calculating an institution return on investment for each group.

The goal of the study is to add to the national knowledge of providing evidence supporting the continuation of the PSR and provides a foundational model to build business cases to support present and future specialty program funding.

Scope of the study

The scope of the study focuses on a standardized approach called COBRAM© to measure the ROI of three different perioperative on-boarding processes. The study explores the effectiveness of a healthcare organization’s (HCO’s) financial investment supporting three different on-boarding processes to fill perioperative critical staffing positions. The study will determine the cost-benefit ratio and the ROI for the three different perioperative on-boarding programs.

Assumptions

The first assumption is that the retrospective data is accurate. Secondly, it is assumed that the costs are reflective of recruitment, hiring, and filling open vacancy
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staffing needs. Lastly, it is assumed that the unit costs of staffing needed during the vacancy replacement, and the full investment of the on-boarding costs are accurate.

Significance of the Study

This study expands and updates previous cost-benefit models that included the costs of recruitment, unit hiring vacancy costs, and the on-boarding of new staff. The model creates and deploys a cost-benefit ratio model that demonstrates the HCO’s return on investment outcomes to three onboarding models. It is hoped that the findings are meaningful and valuable to HCOs by increasing the foundational understanding of the true investment costs and the outcomes attained. Based upon these findings and the use of the COBRAM © model, funding for the program is continued and offers rationale for funding new specialty residency programs.
CHAPTER 2

REVIEW OF THE LITERATURE

A comprehensive search strategy of evidence examining methodologies to calculate the cost of nursing vacancy and turnover, trends in projected national nursing turnover with emphasis in perioperative services, and residency programs cost-benefit was conducted. The literature search strategy and results obtained included examination of CINAHL, Cochrane, EBSCO, PubMed from 1995 through 2016. This timeframe also encompassed historically relevant documents essential to approaches defining methodologies to determine the costs of turnover, recruitment, hiring, and education. The search findings underwent additional screening to identify literature which provided foundational concepts to the research content. Key MeSH terms such as transition to practice nursing residency programs (TtP), nursing turnover, and adaptive enterprise yielded extensive evidence while specialty residency programs, perioperative nursing residency programs, residency program return on investment yielded limited results.

The Challenge Facing Healthcare Organizations

Buerhaus, Staiger, & Auerback (2000) called to national attention that 60% of the RN workforce was over the age of 40, there were 30% less younger RNs under the age of 30, and the specialty with the oldest RN average age was in perioperative services. In 2008, 55% of the RNs were over 50 years of age (Buerhaus, Staiger, & Auerbach, 2008). While the RN workforce continues to age, the pipeline for the younger RN workforce needed to replace the retiring RN workforce remains in jeopardy. AACN (2013) reported 56,657 nursing students graduated nationally. Yet, in the first year post graduated 22.5-69% left their first job due to lack of structured programs designed to teach care.
costs and benefits of a perioperative residency

competencies, aid in integrating and socializing the NLRNs into the organization and work group, and stress related to the transition (Beecroft, Kunzman, & Krozek, 2001; Pine & Tart, 2007; Hillman & Foster 2011; Kramer, et al., 2012; Kovner, Brewer, Fatehi, & Jun, 2014, NSCBN, 2015.) The flight of talent from the retiring population as well as the NLRNs leaving their first jobs places strain on HCOs to provide care to the population they serve. The projected shortage of a competent RN workforce who can provide care to an aging population is projected to be 918,232 by 2030 (Juraschek, Zhang, Ranganathan, & Lin, 2012).

The Cost of Turnover

The national hospital turnover rate is increasing and driving HCOs to respond in an agile, strategic manner to address the staffing shortages. The national hospital RN turnover rate is reported at 17.2% which is up from 16.4% in 2014 (NSI, 2016). The NSI report also identifies the costs of turnover average ranging from $37,700 to $58,000 with the average hospital losing $5.2 – $8.1 million per year. Hospital turnover ranks third in turnover rates when compared nationally to other industries and for every percent change in nursing turnover the cost to the HCO averages $379,500 (Punke, 2016).

Filling these open positions with experienced, competent staff is a significant challenge facing HCOs. The national data demonstrates that the average days to fill open positions with an experienced RN is 82 days which is up from 68 days a year before (NSI, 2106). Even more challenging is the perioperative vacancy time of 94 days (NSI, 2016).

Investment in solutions to reverse this situation calls for HCOs to address attracting and retaining available workforce to fill these vacancies. Benchmarking the
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

costs of turnover and creating business strategies to recruit and train the available workforce remains a significant challenge. There is a lack of standardized definition of turnover and turnover costs throughout the literature (Kovner, Brewer, & Fatehi, 2014). This creates a variation in measurement and design. These factors influence the ability to interpret and translate the body of evidence into practice with confidence.

**Inconsistent Methodology in Measuring Turnover Costs**

Jones and Gates (2007) point out that the cost of turnover may vary between 0.75 and 2.0 times an RN salary. Duffield, Roche, Homer, Buchan, and Dimitrelis (2014) conducted a comparative literature review examining the costs of turnover. Direct costs were defined as advertising, vacancy replacement, and hiring. Indirect costs were defined as orientation, decreased productivity, and termination. The human and financial costs were thought to negatively impact HCO budgets, patient outcomes, and staff outcomes. The authors called for additional research to provide in-depth examination and reporting on the actual costs attributed to turnover. Turnover data may be defined as leaving the organization within the first year of hire while other studies may take this time period out to two years (Casey, Fink, Krugman, & Propst, 2004). Both approaches offer meaningful data which leads to insight; however, all the data, if combined together may lead to errors in interpretation.

Concomitant with this challenge is the methodology used to calculate the cost of turnover. There is a variety of nursing turnover calculation approaches. The most widely used tool is the Nursing Turnover Cost Calculation Methodology (Li & Jones, 2013). Another methodology is a cost-benefit analysis comparing the expected benefits and the costs of the program (Trepanier, Early, Ulrich, & Cherry, 2012). Findings, while valuable
for each individual study, may lead to inaccurate conclusions since the calculations often
do not include the same indicators.

Li and Jones (2013) conducted a literature review on nursing turnover costs from
evidence published from 1990 through 2010. Findings presented a variety of conclusions
and conceptualizations about nursing turnover although cost elements in the calculations
were similar between the studies. There is still little known and defined as to the actual
costs of turnover and the benefits of nursing retention.

The inclusion of indirect costs to the quality of patient care, patient harm, the loss
of patients when turnover impacts ability to staff, the cost of filling staffing positions
related to turnover, impact to costs related to burnout and absenteeism all play into a lack
of consistency in calculating costs in a standardized manner. Direct costs may include the
cost of resident, preceptor, and educator salaries, and specialty programs and curricula.

**Return on Investment Methodological Approach**

Dr. Donald Kirkpatrick is recognized as developing one of the education
industry’s evaluation standards in the 1950’s (Kirkpatrick Partners, 2017). The
Kirkpatrick Model is composed of four levels. Level one address the participant’s
reaction to the educational program; level two examines the participant’s ability to
acquire and understand knowledge and technical skills; level three measures the degree to
which the participant transfers learning into performance; and level four connects the
impact that the performance learned contributes to the targeted outcomes (Kirkpatrick &
Kirkpatrick, 2016). This approach offers four different measurements which provide
value to measuring the effectiveness of the educational program but does not offer a
financial calculation to demonstrate the program’s financial value.
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Dr. Jack Phillips expanded Dr. Kirkpatrick’s model and added a fifth level called the return on investment. The ROI Model offers the avenue to measure a program’s performance but also captures performance metrics which provides the financial impact of the program (ROI Institute, 2017). Table 1 represents the formulas used to calculate CBR and ROI. The cost-benefit ratio (CBR) compares the total program benefits and total program costs (Phillips, Bothell, & Snead, 2002). A ratio of 1:1 reflects a breakeven investment. A ratio of 0.50 is a negative investment where only $0.50 is returned on a $1.00 investment however a ratio of 2.25 represents a positive return achieving a outcome or profit of $1.25 for every $1.00 invested (Bailey, 2015; Buzachero, Phillips, Phillips, & Phillips, 2013).

Table 1: Formulas for Cost-Benefit Ratio and Return on Investment

<table>
<thead>
<tr>
<th>CBR Formula</th>
<th>CBR = ( \frac{\text{Total Program Benefits} - \text{Total Program Costs}}{\text{Total Program Costs}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROI Formula</td>
<td>( \frac{\text{Total Program Benefits} - \text{Total Program Costs}}{\text{Total Program Costs}} \times 100% )</td>
</tr>
</tbody>
</table>

Clinical Return on Investment Approach for Nursing Residencies

The clinical evidence presented in the literature reviews from 1992 through 2016 demonstrates a wide approach to measuring the return on investment (ROI). Anderson, Hair, & Toledo’s (2012) meta-analysis of eleven nursing residency programs used a quantitative approach to review the programs outcomes. The analysis approach examined factors that influence resident satisfaction including extrinsic awards, integration into the healthcare team, communication, and work environment. Beecroft, Kunzman, & Krozek (2001) reported a 67.3% ROI on a one-year NLRN residency pilot with a net program cost benefit of $543,001. Woods (2004) showed the ROI in an academic nurse residency
program by increased retention of those NLRNs participating in the residency resulting in almost ten-fold savings. Pine & Tart (2007) publish an 884.75 % ROI on a baccalaureate RN Residency Program with a net program benefit of $823,680. Hansen (2014; Hansen, 2015) published three articles delineating calculating and reporting the financial cases for nurse residency programs which included identifying the cost of replacing a graduate nurse and 25% turnover costs for 40 graduate nurses. This study reported a 219% ROI for the program.

While the evidence presented in the major databases of Cochrane, PubMed, CINAHL, EBSCO, and Medline largely concentrates on new graduate nurse residency programs, there is research movement towards building, deploying and evaluating the effectiveness of specialty residency programs. The majority of studies examine NLRNs participating in transition to practice programs versus experienced nurses transitioning into new specialties, thus, there is less comparative data to examine (Jones, 1992, Jones, 2004; Jones, 2005; Anderson, Hair, & Todero, 2012; Lin, Viscardi, McHugh, 2014). The financial investment associated with the direct and indirect costs of traditional new graduate residency programs is present in the literature but for experienced nurses transitioning into new specialties, there is very little comparative data and outcomes published (Jones, 1992, Jones, 2005; Lin, Viscardi, McHugh, 2014).

The challenge the nurse executive can or will encounter when championing a specialty residency program lies in the need to influence organizational funding sources and leadership to invest significant monies to build, deploy, staff, and sustain these programs. Without the ability to justify and show a ROI to the organization, the nurse executive can experience a difficult journey.
Chappy, Madigan, Doyle, Conradt, and Tapio (2016) presented a Perioperative Residency Program that is offered to nursing students in the last semester of their program. Perioperative staff act as clinical preceptors for 14 weeks assisting in the transition from academia into clinical practice. Results from this program include: improved marketability of the students’ post-graduation, improved reasoning, exposure to the realities of a real-life patient load, access to immediate feedback, and improved confidence. The authors pointed out that the cost of the program for students was $250, often covered by the organization; whereas, when the organization must recruit these nursing students into their organization, the estimated cost is resulting in savings ranges from $16,000 to $25,000 per student.

Graling & Rusynko (2001) presented study findings focusing on reporting retention, decreasing use of travelers, and reduction of vacancy rates. This study found that the use of the perioperative fellowship program resulted in a reduction of perioperative nurse vacancy rates from 27% to 15.5%. Sanderhusen, Rusynko, & Wethington (2004) outlined calculating the ROI based upon Dr. Jack Phillips’ methodology to demonstrate the ROI of a perioperative fellowship program. The study reported that the program resulted in a $37,037/RN fellow was achieved in reducing traveler salary costs. Persaud (2008) reinforced that hiring new graduates into the perioperative setting was becoming a more accepted practice but attention to how they are on-boarded and educated in perioperative care competencies was critical in order to retain them in the services. The study presents the success in retaining the RNs in the program and the evolution of these RNs into mentors for new program participants.
Summary

Healthcare organizations (HCOs) can translate the evidence and adapt recruitment, hiring and on-boarding to compete in competitive RN job markets. The opportunity is present to create business cases to fund transition to practice and specialty residency programs. The evidence in the literature demonstrates that there are three areas to build standardized models that measure investment costs reflecting: (1) recruitment direct and indirect costs, (2) hiring unit direct and indirect costs, and (3) the costs of on-boarding education. Financial outcomes of the costs of vacancy, turnover, impact to patient safety and quality, and the cost of lost services offer HCOs a variety of outcome sources to explore.
CHAPTER 3

THEORETICAL MODEL AND METHODOLOGY

Theoretical Model

The theoretical foundation for this study is based upon Stephan Haeckel’s (1999) Adaptive Enterprise Sense and Respond Model. While designed initially to address the challenges of discontinuity in the competitive technology industry, the core concepts of this model resonate in the complexity and challenges seen in the healthcare industry. Dr. Haeckel’s approach to responding to discontinuity comprises three themes: “business focus must shift from products to processes and competencies; individuals close to the firing line must be empowered; and customers’ needs must receive attention,” (Haeckel, 1999, p.3).

*Figure 2: Haeckel’s Sense and Respond Adaptive Enterprise Model*
Two contracting operational models, the “Make and Sell” Model Organization and the “Sense and Respond” Model Organization, are represented in Figure 2. The “Make and Sell” organization focuses on production and delivery of services based upon calculated, forecasted customer needs. Operational concepts driving workflow are embedded in a leadership philosophy bound to minimizing unpredictability, staying the course with their mission, driving strategy through a functional hierarchy, and minimizing disruptions until external signals force change. The “Sense and Respond” organization while founded in mission and purpose, structures an operational framework that embraces unpredictability, constantly sensing internal and external signals alerting to changes in market need, and integrating a process to rapidly respond and adapt to these changes (Haeckel, 1999).

The healthcare environment is dynamic and while attention must be given to strategic planning, there is increasing awareness that continual surveillance of healthcare trends and dynamics are a high priority and call for a defined robust approach to dedicated resources to accelerate an operational response. To be market competitive and financially stable, an organization must have a process workflow that can accelerate and mobilize rapid change in services to meet healthcare needs and workforce challenges (Worley, Williams, & Lawler, 2014). The focus is to push past routine services and workflows by sensing the changes in the environment, translating the evidence, maximizing an adaptive environment and processes which embraces innovation, intentionality, and a drive to achieve what the organization must become to remain a market leader (Worley, Williams, & Lawler, 2014). The Sense and Respond model applied in healthcare settings creates pathways to a reinvention of the organization’s
capacity, a customer-centric focus aligning services to meet healthcare needs, and ability to innovate in a rapid manner to bridge services and staffing to fulfill needs (Kenagy, 2017).

This study focuses on a healthcare organization’s (HCO) adaptive response to the external signals of an increasing gap between the present and future perioperative service needs of the population served and the internal signals of a retiring perioperative workforce versus the numbers of competent staff required to fill the open positions. The gap between the population’s perioperative service needs versus the inability to fully staff to fulfill the needs signals that the organization must respond with a management commitment to address these signals by investing financial and human capital educational resources to build, deploy and show the return on investment in creating a perioperative workforce pathway. The adaptive process aligns the responsibilities of the Perioperative management team, Clinical Education, and Human Resources to create and deploy a process to recruit the right nurses to fill the positions required, educate them in the clinical competencies to provide care, and measure the return on investment. Organizations that can capture the pipeline for perioperative staffing recruitment, provide seamless services, and evolve based upon continuous evaluation of process effectiveness may a greater chance to become or remain the local and national market leaders (Surgical Directions, 2013).

Methodology

The retrospective data analysis study design compares the return on investment (ROI) of three on-boarding models used between 2009 through 2016. These models include: a six-month Periop101 Program offered from 2009-2014, a six-month immersive
Perioperative Specialty Residency (PSR) Program offered from 2005-2016, and NLRN and experienced RNs who were not offered, or chose not to enter either the P101 Residency, or the new PSR residency during 2009 - 2016.

The specific research questions include:

1. Is there a statistically significant difference in the three models' participants’ success to complete orientation?

2. Is there a statistically significant difference in the three models' participants’ 6-month and 12-month retention?

3. Is there a positive Cost-Benefit ratio and return on investment (ROI) for the three models in reducing the costs incurred with staff overtime and traveler salaries?

A cost-benefit analysis using the COBRAM© tool will illustrate the ROI of the three on-boarding models and descriptive statistics of frequency, percentage, Chi Square and Pearson Chi-Square, and Cramer’s V were used to analyze the population studied.

The study design and methodology is seen in Figure 3.

Figure 3: Methodology and Study Design
Procedures for Data Collection and Project Data Collection Site

Institutional Review Board (IRB) review and approval was obtained from the University of New Mexico (UNM) and the non-profit organization which is located in the southwest part of the U.S. The approval letters from these institutions (See Appendices A & B). The data was collected through the Human Resource Department data, Perioperative Finance Services, and the Clinical Education Department.

Study Population

The retrospective data analysis study examines three target populations, a six-month immersive Perioperative Specialty Residency (PSR) Program the Periop 101 Program, and experienced nurse group who were not offered, or chose not to enter either the P101 residency, or the new PSR residency, who worked within Perioperative services from 2009 through 2016. These three groups received their educational on-boarding at the organization’s perioperative services at three campuses. Three on-boarding models were used during this time period. These included:

- Eight-week standard orientation with a preceptor
- Six-month AORN Periop 101 Program with a preceptor
- Six-month Perioperative Specialty Residency Program using the AORN Periop 101 modules, a dedicated coordinator and preceptors.

Exclusion criteria included participants who did not have a current RN license or did not work in the perioperative area in one of these three programs in the years from 2009 through 2016. Additionally, those who were dismissed from program participation because of non-professional behaviors, inability to complete the program because of
illness, catastrophic events, and lack of motivation to continue the program, and/or relocation out of state were also excluded.

**Sources of Data**

All data sources are internal to the organization. The Operating Room Financial Metrics Tool data are collected in conjunction with the Study Organization’s Human Resources team, the Study Organization’s Perioperative Finance and Management Team, and the Study Organization’s Clinical Education team to examine the costs of recruiting, hiring, education, and training of the perioperative staff from 2009 through 2016. This tool uses a retrospective audit collection process of perioperative financial data that is available to the perioperative management and human resource teams.

**Data Collection Process and Tools**

Data were collected from the Study Organization’s Human Resources databases, the Study Organization’s Perioperative Finance and Management Team databases, and the Study Organization’s Clinical Education team databases. The data collected was categories into four sections: population demographics, pre-hire direct and indirect costs of recruitment and hiring, education direct and indirect costs, and the unit costs of staff overtime and contracted agency staffing.

The population demographics included: RN hire and termination dates, the months in employment in the Study Organization’s Perioperative services, sex, and hourly salaries. Age range data was provided by de-identified RN job profile title. The pre-hire direct and indirect costs include: Human Resource (HR) employee and employee health salaries, Perioperative management time and salaries, Perioperative interview team time and salaries, and Perioperative job shadow team time and salaries, empty FTE back-
fill by contract agency staff during recruitment and on-boarding education, advertising costs, relocation and sign-on bonuses, and out of state interview costs. The education on-boarding costs included: hourly salary/hour of orientation, total orientation training cost, preceptor salary, educator salary, training materials, licensing of AORN Perioperative 101 Program, simulation equipment, administrative support, and computers. The pre-hire costs include: HR employee and employee health salaries, Perioperative management, interview team, and shadow team salaries, empty FTE back-fill by contract labor staff, advertising costs, relocation and sign-on bonuses, and out of state interview costs.

**Data Protection Plan**

The extracted, de-identified data will be recorded into the Perioperative Human Resource Data Collection Tool Excel Spreadsheet / electronic file by the investigator which is housed on an encrypted computer in a locked office in a locked drawer accessible only to the investigator. This data was then placed into the COBRAM Calculator on the same encrypted computer in a locked office in a locked drawer.

**Timeline**

This is a retrospective data analysis study. The timeline for this study: includes these components:

1. Planning and approval process (May, 2016 – December, 2016)
   a. Obtain approval from Study Organization’s Executive leadership to conduct study (See Appendix E)
   b. Create the data collection tools

2. Obtain IRB approval from UNM and Study Organization’s IRB
3. Data collection and analysis (January, 2017 – March 5, 2017)
   a. Collect data
   b. Run statistical analysis with support team
   c. Interpret results

4. Doctor of Nursing Practice Scholarly Project completed and defended by April 6, 2017.

**Statistical Analysis**

Descriptive statistics of frequencies, percentages, Pearson Chi-Square, and Cramer’s V are used to analyze the participants of the three groups: Perioperative Specialty Residency (PSR) Program, the Perioperative 101 Program, and experienced nurses who were not offered, or chose not to enter either the P101 residency, or the new PSR residency. The COBRAM© will provide the framework for determining the cost-benefit ratio for the three groups as compared with the costs of staffing with travelers.

**Budget**

Since this is a retrospective study, expenses were minimal other than the researcher’s time. All tools used: computer, SPSS software, Microsoft Office software is currently owned by the researcher. There are no other known costs for this study.
CHAPTER 4

RESULTS AND DISCUSSION

Results and Findings

A total of (N=155) on-boarding staff participated in one of three education on-boarding models. The three models studied were: the Periop 101 Program (n=22), Perioperative Specialty Residency (PSR) Program (n=22), and the experienced perioperative nurse group who was not offered, or chose not to enter either the P101 residency or the new PSR residency (n= 111), who worked within Perioperative services from 2009 through 2016. The data was organized and placed into the COBRAM\textsuperscript{©} tool to calculate the cost-benefit ratio (CBR) and the return on investment (ROI) for the three groups. Descriptive statistics of frequencies and percentages were used to describe the sample, and Pearson Chi-square to measure the significance, and Cramer’s V were used to analyze the strength of association.

Group Characteristics: Demographics

Table 2 presents the frequencies and percentages for the study groups’ characteristics which included: the sex of the participants, experience level, education on-boarding process successful completion, and 6-months and 12-months post education on-boarding retention. Of the N =155 participants, n= 137 (91.6%) were female and n= 18 (11.6%) were male greater than the national average of 7% (Battie, 2013; Budden, Zhong, Mouton, & Ciminotti, 2013). Experienced perioperative on-boarding RNs n= 111(71.6%) as compared to n= 44 RNs (28.4%) who were new to perioperative nursing.
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Table 2: Perioperative On-Boarding RN Demographics, all three groups

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>18</td>
<td>11.6</td>
</tr>
<tr>
<td>Female</td>
<td>137</td>
<td>91.6</td>
</tr>
<tr>
<td>Inexperienced in Perioperative Nursing</td>
<td>44</td>
<td>28.4</td>
</tr>
<tr>
<td>Experienced in Perioperative Nursing</td>
<td>111</td>
<td>71.6</td>
</tr>
<tr>
<td>Total Number</td>
<td>155</td>
<td></td>
</tr>
</tbody>
</table>

Group Characteristics: Age Distribution

Representation of Study Organization’s perioperative RN age distribution for years 2009 - 2016 are presented in Table 3 and Figure 4. The national perioperative RNs average age is 53 years of age as compared to the United States RN average age of 50 years (ANA, 2014; Sherman, Chiang-Hanisko, & Koszalinski, 2013, NCSBN, 2015). The Study Organization’s perioperative RN age distribution from 2009-2016 are 45.6 to 48.2 years.

Table 3: Average Age of Perioperative RN Staff Versus National Benchmarks

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization’s Perioperative RNs</td>
<td>45.6</td>
<td>47.6</td>
<td>48.1</td>
<td>47.2</td>
<td>46.3</td>
<td>48.2</td>
<td>47.2</td>
<td>47.3</td>
</tr>
<tr>
<td>Benchmark Perioperative RNs</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>Benchmark RNs</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
Figure 4: Average Age of Study Organization's Perioperative Nurses 2009-2016

Combined Three Group Results: Education On-Boarding Success and 6 to 12 Month Retention

Table 4 presents the total numbers of the on-boarding RNs (Periop 101, PSR, experienced perioperative RNs) who successfully completed the orientation process and the six- and twelve-month retention. Table 3 illustrates that 91.6% of the total population N=155 successful completed orientation. Of the N = 155 on-boarding RNs, 85.2% were retained six months post orientation and 72.9% were retained twelve months post orientation.

Table 4: Combined group education on-boarding success completion and retention

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed Orientation</td>
<td>142</td>
<td>91.6</td>
</tr>
<tr>
<td>Did not Complete Orientation</td>
<td>13</td>
<td>8.4</td>
</tr>
<tr>
<td>Retained 6 Months</td>
<td>132</td>
<td>85.2</td>
</tr>
<tr>
<td>Termed &lt; 6 Months</td>
<td>23</td>
<td>14.8</td>
</tr>
<tr>
<td>Retained 12 Months</td>
<td>113</td>
<td>72.9</td>
</tr>
<tr>
<td>Termed &gt; 6 months ≤12 Months</td>
<td>42</td>
<td>27.1</td>
</tr>
<tr>
<td>Total Number</td>
<td>155</td>
<td></td>
</tr>
</tbody>
</table>
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Breakout of Three Groups: Education On-Boarding

Table 5 presents the breakout of the difference between the three groups’ (Periop 101, PSR, experienced perioperative RNs) education on-boarding success.

Table 5: Group Breakout: Education On-Boarding Completion: Frequencies & Percentages

<table>
<thead>
<tr>
<th>Groups</th>
<th>Frequencies &amp; Percentages</th>
<th>Education On-Boarding Not Completed</th>
<th>Education On-Boarding Completed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>f</td>
<td>2</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>9</td>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>f</td>
<td>2</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>9</td>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>f</td>
<td>9</td>
<td>102</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>8</td>
<td>92</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>f</td>
<td>13</td>
<td>142</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>8.4</td>
<td>92</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 6 and Table 7 illustrate that there is no statistically significant difference between all three-groups’ ability to successfully complete the education on-boarding as reflected in a Pearson Chi Squared of .980 and a Cramer’s V of 0.980.

Table 6: Group Breakout: Education On-Boarding Completion: Chi-Squared Test for Significance

<table>
<thead>
<tr>
<th>Chi Squared Tests (Sig 0.05)</th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2 Sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>.40</td>
<td>2</td>
<td>.980</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>.039</td>
<td>2</td>
<td>.981</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.034</td>
<td>1</td>
<td>.854</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>155</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7: Group Breakout: Education On-Boarding Completion: Cramer’s V Test of Association

<table>
<thead>
<tr>
<th>Symmetric Measures (Sig 0.05)</th>
<th>Value</th>
<th>Approximate Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal by Nominal</td>
<td>Phi</td>
<td>.016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.980</td>
</tr>
<tr>
<td>Cramer’s V</td>
<td>.016</td>
<td>.980</td>
</tr>
<tr>
<td>Number of Valid Cases</td>
<td>155</td>
<td></td>
</tr>
</tbody>
</table>

Breakout of Three Groups Results: 6 and 12 Month Retention Results

Table 8 presents the breakout of the difference between the three groups’ (Periop 101, PSR, experienced perioperative RNs) 6-month retention frequency and percentages.

Table 8: Group Breakout: 6-Month Retention: Frequencies & Percentages

<table>
<thead>
<tr>
<th>Groups</th>
<th>Frequencies and Percentages</th>
<th>Retained 6 Months</th>
<th>Termed by 6 Months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>f</td>
<td>20</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>91</td>
<td>9.10</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>f</td>
<td>21</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>95.5</td>
<td>4.5</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>f</td>
<td>91</td>
<td>20</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>82.0</td>
<td>18.0</td>
<td>100</td>
</tr>
<tr>
<td>Totals</td>
<td>f</td>
<td>132</td>
<td>23</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>85.2</td>
<td>14.8</td>
<td>100</td>
</tr>
</tbody>
</table>

Tables 9 and 10 present the breakout of 6-month retention for each the groups.

There is no statistically significant difference between all three groups in 6-month retention as reflected in a Pearson Chi Squared of .191 and the Cramer’s V of 0.191.
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Table 9: Group Breakout: 6-Month Retention: Chi-Squared Test for Significance

<table>
<thead>
<tr>
<th>Chi-Squared Tests (Sig 0.05)</th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2 Sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person Chi-Square</td>
<td>3.308</td>
<td>2</td>
<td>.191</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>3.919</td>
<td>2</td>
<td>.191</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>2.206</td>
<td>1</td>
<td>.137</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>155</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10: Group Breakout: 6-Month Retention: Cramer’s V Test of Association

<table>
<thead>
<tr>
<th>Symmetric Measures (Sig 0.05)</th>
<th>Value</th>
<th>Approximate Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal by Nominal</td>
<td>Phi</td>
<td>.146</td>
</tr>
<tr>
<td></td>
<td>Cramer’s V</td>
<td>.146</td>
</tr>
<tr>
<td>Number of Valid Cases</td>
<td></td>
<td>.155</td>
</tr>
</tbody>
</table>

Table 11 presents the breakout of the difference between the three groups’ (Periop 101, PSR, experienced perioperative RNs) 12-month retention frequency and percentages.

Table 11: Group Breakout: 12-Month Retention: Frequencies & Percentages

<table>
<thead>
<tr>
<th></th>
<th>Frequencies &amp; Percentages</th>
<th>Retained 12 Months</th>
<th>Termed by 12 Months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>16</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>Group</td>
<td>%</td>
<td>73</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>f</td>
<td>14</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>64</td>
<td>36</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>f</td>
<td>83</td>
<td>28</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>75</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>f</td>
<td>113</td>
<td>42</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>73</td>
<td>27</td>
<td>100</td>
</tr>
</tbody>
</table>

Tables 12 and 13 present the Pearson Chi Squared value of .562 and the Cramer’s V of .562 for the 12-month retention between the three groups and a statistically significance difference is not present.

29
Costs and Benefits of a Perioperative Residency

Table 12: Group Breakout: 12-Month Retention- Chi-Squared Test for Significance

<table>
<thead>
<tr>
<th>Chi Squared Tests (Sig 0.05)</th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2 Sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person Chi-Square</td>
<td>1.154</td>
<td>2</td>
<td>.562</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>1.100</td>
<td>2</td>
<td>.577</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>.275</td>
<td>1</td>
<td>.600</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>155</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 13: Group Breakout: 12-Month Retention: Cramer’s V Test of Association

<table>
<thead>
<tr>
<th>Symmetric Measures</th>
<th>Value</th>
<th>Approximate Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal by Nominal</td>
<td>Phi</td>
<td>.086 .562</td>
</tr>
<tr>
<td></td>
<td>Cramer’s V</td>
<td>.086 .562</td>
</tr>
<tr>
<td>Number of Valid Cases</td>
<td></td>
<td>155</td>
</tr>
</tbody>
</table>

Cost-Benefit Ratio Financial Analysis

The cost-benefit ratio (CBR) of a program defines the financial investment and the returns on that investment. The CBR was calculated for the two years that the residents are under contract to the organization. While the experienced perioperative group were not under a two-year contract, the study’s framework included this group to provide a comparative analysis for the investment outcome.

The CBR results are presented in Table 14. The breakeven benchmark (1.0) represents that for every one dollar invested in recruitment, education, and salaries of the new hire a return of one dollar reduction of traveler salaries is achieved. The national benchmark of 1.25 represents that for every one dollar investment a positive return of at least 25% is gained by the organization in reducing traveler salaries. In the first year of the investment, the costs of recruitment, education, and salary for staffing still outweigh the ability to mitigate the cost of traveler salaries at both break even and beating national benchmark. This negative gap in investment for the program’s first year ranges are:
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Perioperative 101 RN CBR is 0.174 – 0.56, Perioperative Specialty Residency is 0.30 – 0.47 and experienced Perioperative RNs on-boarding is 0.16 through 0.96 versus the benchmarks of 1.0 and 1.25

By year two substantial benefit reducing traveler salaries is demonstrated. The positive second year return for Perioperative 101 RN CBR is: 1.73 – 2.38, Perioperative Specialty Residency CBRs is 2.25 – 3.29, and experienced Perioperative RNs on-boarding range from 1.87 – 3.29 versus benchmarks of 1.0 and 1.25.

Table 14: Cost Benefit Ratio Analysis for One and Two Years

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Periop 101</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year CBR</td>
<td>0.56</td>
<td>0.41</td>
<td>0.34</td>
<td>0.32</td>
<td>0.174</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Year CBR</td>
<td>2.38</td>
<td>2.09</td>
<td>1.95</td>
<td>1.89</td>
<td>1.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PSR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year CBR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.3</td>
<td>0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Year CBR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.29</td>
<td>2.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Experienced Perioperative RNs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year CBR</td>
<td>0.96</td>
<td>0.79</td>
<td>0.28</td>
<td>0.47</td>
<td>0.16</td>
<td>0.427</td>
<td>0.3</td>
<td>0.93</td>
</tr>
<tr>
<td>2 Year CBR</td>
<td>3.28</td>
<td>2.99</td>
<td>2.1</td>
<td>2.37</td>
<td>1.87</td>
<td>2.25</td>
<td>2.85</td>
<td>3.29</td>
</tr>
</tbody>
</table>

*Breakeven = 1.0  Benchmark = 1.25

In Figure 5, comparison of one and two-year CBR for the three groups (Periop

*Figure 5: Cost-Benefit Ratio of One and Two Year CBR for three Education Onboarding Groups*
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

101, PSR, experienced perioperative RNs) from 2009 - 2016 is depicted. For year one, negative CBRs (< 1.0) across all three groups are illustrated. The trend reverses in the two-year data for all three groups which demonstrate a positive CBR (1.73 – 3.29).

Cost-benefit ratio financial analysis - individual investment. The overall financial results demonstrate that the return on investment (ROI) in traveler salary cost savings is illustrated in Table 15. The average investment in the recruitment, unit staffing vacancy costs, hiring, and education on-boarding of the new hire was $115,076. The average cost of a perioperative traveler for one-year of full time salary was $156,000. The return on investment per employee was $40,923.

<table>
<thead>
<tr>
<th>Table 15: Return on Investment for Total Program (N= 155)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment per Employee = $115,076</td>
</tr>
<tr>
<td>Investment per Traveler = $156,000</td>
</tr>
<tr>
<td>ROI Traveler Savings/Employee = $40,923</td>
</tr>
<tr>
<td>ROI Traveler Savings/Total Cohort = $40,923 x 155= $6,343,065</td>
</tr>
</tbody>
</table>

The relationship of the cost-benefit ratio to dollars invested in the recruitment and education on-boarding of the three groups individual employees is represented in Tables 16, 17, 18, and Figure 6. This financial data reflect the HCO’s initial year of investment and then the results of replacing the traveler salaries two years past the initial investment for each employee.

Periop 101 CBR findings. The Periop 101 (Group 1) demonstrated a negative CBR investment per employee for the first year of employment. Monies invested per employee in each of group 1’s cohorts from 2009 through 2014 ranged from $37,522 to $100,397. No positive return on investment (ROI) in the first year of employment was
realized. By year two, a positive CBR and ROI per employee in group 1’s cohorts ranged from $82,076 to $128,478 in traveler salary savings.

**Preoperative specialty residency (PSR) CBR findings.** The PSR (Group 2) also demonstrated a negative CBR investment per employee for the first year of employment. The investment per employee in each of group 2’s cohorts from 2015 through 2016 ranged from $60,990 to $85,633. No positive return on investment (ROI) in the first year of employment were realized but in year two positive CBR and ROI per employee in group 2’s cohorts ranged from $112,185 to a projected $147,076 in traveler salary savings.

**Experienced Perioperative RN CBR findings.** The experienced perioperative RN (Group 3) demonstrated a negative first year investment CBR and ROI from 2009 to 2016 however the negative investment was less than either groups 1 or 2. The investment per employee in each of group 3’s cohorts ranged from $341.38 to $93,929. By year two significant CBR and ROI was realized with a traveler salary savings ranging from $118,133 to a projected $343,347.

**Table 16:** Cost Benefit Ratio Analysis for One and Two Years: Periop 101 (Group 1)

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Year Loss</td>
<td>$37,522</td>
<td>0</td>
<td>$54,657</td>
<td>$50,609</td>
<td>$66,754</td>
<td>$100,397</td>
</tr>
<tr>
<td>2 Year Savings</td>
<td>$128,478</td>
<td>0</td>
<td>$107,465</td>
<td>$110,783</td>
<td>$93,226</td>
<td>$82,076</td>
</tr>
</tbody>
</table>

**Table 17:** Cost Benefit Ratio Analysis for One and Two Years: Perioperative Specialty Residency (Group 2)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year CBR</td>
<td>$85,633</td>
<td>$60,990</td>
</tr>
<tr>
<td>2 Year CBR</td>
<td>$112,185</td>
<td>$147,076</td>
</tr>
</tbody>
</table>
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Table 18: Cost Benefit Ratio Analysis for One and Two Years: Experienced Perioperative RN (Group 3)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year CBR</td>
<td>$3441</td>
<td>$18,838</td>
<td>$76,189</td>
<td>$65,211</td>
<td>$93,919</td>
<td>$58,009</td>
<td>$74,557</td>
<td>$7694</td>
</tr>
<tr>
<td>2-Year CBR</td>
<td>$279,207</td>
<td>$248,352</td>
<td>$141,718</td>
<td>$126,961</td>
<td>$118,133</td>
<td>$175,292</td>
<td>$254,964</td>
<td>$342,347</td>
</tr>
</tbody>
</table>

Figure 6: Savings or Loss in Traveler Salary per Employee over Two-Year Employment

Cost-benefit ratio financial analysis - total cohort investment. The overall ROI for the total group (N=155) was $6,343,065. The relationship of the cost-benefit ratio to dollars invested in the recruitment and education on-boarding of each of the three groups is represented in Tables 19, 20, 21 and Figures 7 and 8.

Periop 101 CBR findings. The Periop 101 (Group 1) demonstrated a negative CBR investment per employee for the first year of employment. Monies invested per group 1’s total cohorts from 2009 through 2014 ranged from $112,566 to $501,985. No return on investment (ROI) in this first year of employment was realized. By year two, a
positive CBR and ROI for group 1’s cohorts ranged from $322,395 to $652,582 in traveler salary savings.

**Preoperative specialty residency (PSR) CBR findings.** The PSR (Group 2) also demonstrated a negative CBR investment per cohort for the first year of employment. The investment per group 2’s cohort from 2015 through 2016 ranged from $669,900 to $1,370,128. No return on investment (ROI) in this first year of employment were realized but a positive CBR and ROI per employee in group 2’s cohorts ranged from $1,617,836 to a projected $1,794,960 in traveler salary savings in year two.

**Experienced Perioperative RN CBR findings.** The experienced perioperative RN per cohort (Group 3) demonstrated a negative first year investment CBR and ROI from 2009 to 2016 however the negative investment was less than either group 1 or 2 cohorts. The investment per cohort in group 3’s cohorts ranged from $34,418 to $1,599,959. By year two significant CBR and ROI was realized with a traveler salary savings ranging from $279,207 to a projected $3,765,817.

**Table 19:** Cost Benefit Ratio Analysis for One and Two Years: Periop 101 Cohort (Group 1)

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year CBR</td>
<td>$112,566</td>
<td>$0</td>
<td>$163,971</td>
<td>$202,436</td>
<td>$467,278</td>
<td>$501,985</td>
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<tr>
<td>2-Year CBR</td>
<td>$385,434</td>
<td>$0</td>
<td>$322,395</td>
<td>$443,132</td>
<td>$652,582</td>
<td>$410,380</td>
</tr>
</tbody>
</table>

**Table 20:** Cost Benefit Ratio Analysis for One and Two years: Perioperative Specialty Residency Cohort (Group 2)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Year CBR</td>
<td>$1,370,128</td>
<td>$669,900</td>
</tr>
<tr>
<td>2 Year CBR</td>
<td>$1,794,960</td>
<td>$1,617,836</td>
</tr>
</tbody>
</table>
Table 21: Cost Benefit Ratio Analysis for One and Two Years: Experienced Perioperative RN Cohort (Group 3)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year CBR</td>
<td>$34,418</td>
<td>$188,380</td>
<td>$1.6 million</td>
<td>$782,532</td>
<td>$2.16 million</td>
<td>$580,090</td>
<td>$1.04 million</td>
<td>$84,634</td>
</tr>
<tr>
<td>2-year CBR</td>
<td>$279,207</td>
<td>$2.48 million</td>
<td>$2.97 million</td>
<td>$1.52 million</td>
<td>$2.71 million</td>
<td>$1.72 million</td>
<td>$3.57 million</td>
<td>$3.76 million</td>
</tr>
</tbody>
</table>

Figure 7: Savings or Loss in Traveler Salary per Cohort over Two-Year Employment

Figure 8: Total Traveler Salary Savings per Cohort over a 2-year period
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Interpretation of Findings

The Study Organization’s perioperative RN staff average age is 47 years of age over 2009 to 2016 is consistently lower than national average age of perioperative nurses which is 53 years (Sherman, Chiang-Hanisko, & Koszalinski, 2013, and the national average age of 50 years for RNs (NCSBN, 2015). Per Buerhaus, Staiger, & Auerbach (2000), the perioperative RN workforce has the lowest number of RNs below the age of 40 compared to other specialties. This stresses this workforces’ ability to work full time, staff overtime, on-call, and call-ins may stress leading to decreased pointage and motivation to retire. Of note, the Study Organization’s perioperative RN population average age in 2016 is six years below benchmark. The HCO responded in an adaptive manner by creating a workforce pathway in 2009 for onboarding NLRNs and RNs inexperienced in Perioperative care competencies to compliment the experienced RNs hiring and on-boarding processes to fill open positions. The results of this study have quantified the financial and human capital investment needed to fill open positions and the return on that investment related to reducing traveler salary costs for the first time.

The cost-benefit ratio (CBR) calculations conducted on the recruitment, hiring, education in one year and two year analyses found: (1) hiring experienced perioperative staff results in lower costs for orientation than with residency programs, (2) hiring experienced RNs produces a higher return on investment (ROI) and CBR, and (3) although residency programs incur higher organizational investment at the start of the program, in two years, the ROI in reducing traveler salary costs can result in significant positive financial and staffing return.
Discussion

Implications

Using the COBRAM© tool, the cost-benefit ratio (CBR) and the return on investment (ROI) of a program affords leadership the ability to examine program outcomes in relationship to specific goals. For this study, the CBR for the three groups, Periop 101 Residents, Perioperative Specialty Residency (PSR), and experienced perioperative RNs hired into perioperative services from 2009 to 2016 were examined and compared in relationship to reducing traveler salary costs. Findings illustrate by the second year of employment, all three groups contributed to substantial traveler salary reduction. While there are significant upfront investment monies required to recruit, hire, staff services, and educate inexperienced newly licensed RNs (NLRNs) to perioperative services, experienced RNS with no perioperative expertise, and experienced perioperative RNs, two year outcomes in reducing traveler salary costs are apparent.

The Institute of Medicine’s 2010 Future of Nursing Report called to healthcare Organizations (HCOs) to provide both Transition to Practice (TtP) Residencies and Specialty Practice Residencies (IOM, 2010). In the perioperative specialty, nationally there is inconsistency in approach to perioperative specialty residency design and curriculum, inclusion of NLRNs in programs, investment in perioperative residency programs. (Battie, 2013). In the evidence, there is a call to study approaches to measure and report the investment costs and impact against specific outcomes for perioperative residency programs (Gorgone, Arsenault, Milliman-Richard & LaJoie 2016; Sherman, Patterson, Avitable, & Dahle, 2014). HCO leadership may experience difficulty in securing investment funding in financially challenging times. This research supports the
establishment of a standardized model to track, measure, and calculate the CBR and ROI on residency programs against specific cost factors and outcomes.

**Strengths and Limitations of the Study**

**Strengths.** This study provides additional evidence to support the understanding of the investment needed to create workforce pipelines to staff services needed by an aging population. The COBRAM© tool expands upon foundational CBR and ROI models and integrates the direct and indirect costs of Human Resource, Unit Services, and Clinical Education operations to quantify the expansive healthcare organization (HCO) investment in residency programs.

The CBR and ROI calculated and reported in this study offers HCO leaders a definitive tool to calculate and report return on investment with confidence. The evidence presented in this study offers insight and a methodology to build business cases for additional programs needed to achieve a highly-educated workforce.

**Limitations.** A cost-benefit ratio (CBR) analysis that measures and reports the complete program impact includes measuring all the direct and indirect investments costs in relationship to all outcomes. In this research, key outcome measures not studied because of a change in the PHS Human Resource database repository include: the number and costs of vacancy rates as well as the costs of perioperative RN overall turnover, and first-year turnover. Additional key outcomes not studied included patient surgical errors related to vacancy coverage, delayed or cancelled surgical cases, and the indirect costs of reduced staff satisfaction.

There is very little reporting of CBR and return on investment (ROI) for transition to practice, specialty, and perioperative residencies in the national evidence. It is difficult
to compare the results from this research to other studies. This offers the opportunity for further research.

**Suggestions for Future Research**

The healthcare organization’s leadership experiences challenges to bridge the gap between staffing care services and filling open positions with competent care givers. The HCO’s investment to fill the vacancies created by a retiring workforce require innovation and financially sound plans to gain market share and competitiveness. This study focused on examining how an adaptive organization supported the building, deployment, and continuation of perioperative residency programs and an on-boarding strategy for experienced perioperative nurses to fill critical staffing positions. An examination of the cost-benefit ratio and return on financial investment of three groups focused on the reduction of expenses created by traveler salaries. There are other opportunities to examine cost reduction and savings. Areas of potential research quantifying a perioperative residency program’s financial impact and benefit upon defining and standardizing actual RN turnover costs including first-year turnover, vacancy rates, cancelled cases, service expansion, patient safety, retention capacity, and quality of care.

Exploration and comparison of perioperative residency programs success in educating newly licensed RNs versus RNs with no perioperative experience affords many opportunities to examine the most efficient way to educate and transition these groups into highly competent perioperative RNs. A challenge for experienced RNs coming into a new specialty includes the journey and patience needed to acquire a new specialty’s care competencies.
Concluding Remarks

Studies focusing on financial analysis models of residency programs and reporting of cost-benefit ratio and return on investment are scarce in the literature. This study adds additional insight to the studies conducted by Woods, 2003; Sandhusen, Rusynko, & Wethington. 2004; Pine & Tart, 2007; Hillman, 2011; Trepanier, Early, Ulrich, & Cherry, 2012; Hansen, 2015. This study also adds to this research by providing a standardized approach to quantify healthcare organizational investment in recruitment and education on-boarding perioperative new hires that may pave the way for expansion of additional investigation into the investment and outcomes related to programs to support workforce pipelines.
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

References


Auerbach, D. I., Buerhaus, P. I., & Staiger, D. O. (2014). Registered nurses are delaying retirement, a shift that has contributed to recent growth in the nurse workforce. *Health Affairs (Project Hope), 33*(8), 1474-80. doi:10.1377/hlthaff.2014.0128
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY


doi:10.1016/j.aorn.2014.03.015


COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY


doi:10.1016/j.aorn.2011.05.023


doi:10.1097/NNA.0b013e31827f205c


doi:10.1016/j.aorn.2016.05.006


doi:10.1016/j.aorn.2013.10.012
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY


COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY


Kramer, M., Maguire P., Halfer, D., Budin, WC, Hall DS, Goodloe L, ... Lemke J. (2012). The organizational transformative power of nurse residency

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COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY


COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY


Appendix A

Organization Approval to Conduct Research

5-1-2018
Johanna Steinmeier, MS, RN, RN-BC
PDN, Director of Clinical Education and Professional Development

UNMC CON DNP Student

Ms. Tibbs, Ms. Davis, Ms. Rickley, Ms. Gonzales, Ms. Wright, and Ms. Smith,

This letter of support is designed to document your approval to evaluate the effectiveness and impact of the Perioperative Specialty Residency (PSR) Program using these tools:

- The PSR Program Experience Measurement Survey
- OR HR Metrics for turnover, 1st year turnover, vacancy rates, costs of recruitment.
- OR Financial Metrics for recruitment, salaries

Thank you for your support and consideration.

Bela Tibbs
Administrative Director, Surgical Service Line

Kathy Davis, MBA, RN
Senior Vice President, Chief Experience Officer

Joann Rickley, MBA, BSN
Perioperative Director

Brenda Gonzales, RN
Assistant Director, Surgical Service Line

Ann Wright, MSN, RN
CFO, Chief Nursing Officer

Linda Smith, MSN, RN
Director of Academic Services
Human Research Review Committee
Human Research Protections Office

June 7, 2016

P J Woods
MS304591 College of Nursing
1 University of New Mexico
Albuquerque, NM 87123
UNM HSC College of Nursing
PJWoods@salud.unm.edu

Dear P J Woods:

On 6/7/2016, the HRRC reviewed the following submission:

Type of Review: Initial Study
Title of Study: Comparative Costs and Benefits of Registered Nurses (RN) in a Perioperative 101 Program Residency, an Immersive Perioperative (Periop) Specialty Residency (PSR) Program; and RNs Hired into the General Perioperative Setting from 2009-2016
Investigator: P J Woods
Study ID: 16-160
Submission ID: 16-160
IND, IDE, or HDE: None

Submission Summary: Comparative Costs and Benefits of Registered Nurse Residency Programs to Fill Critical Staffing Needs
Documents Approved: Stiersmeyer IRB Proposal v2 05-20-2016
Review Category: Exemption: Categories (4) Data, documents, or specimens
Determinations/Weights: Informed Consent Not Applicable
HIPAA Authorization Addendum Not Applicable

Submission Approval Date: 6/7/2016
Approval End Date: None
Effective Date: 6/7/2016

The HRRC approved the study from 6/7/2016. If modifications were required to secure approval, the effective date will be later than the approval date. The "Effective Date" 6/7/2016 is the date the HRRC approved your modifications and, in all cases, represents the date study activities may begin.

Because it has been granted exemption, this research is not subject to continuing review.
This determination applies only to the activities described in this submission and does not apply should you make any changes to these documents. If changes are being considered and there are questions about whether HRRC review is needed, please submit a study modification to the HRRC for a determination. A change in the research may disqualify this research from the current review category. You can create a modification by clicking Create Modification / CR within the study.

In conducting this study, you are required to follow the Investigator Manual dated April 1, 2015 (HRP-105), which can be found by navigating to the IRB Library.

Sincerely,

[Signature]

Thomas F. Byrd, MD
HRRC Chair
COSTS AND BENEFITS OF A PERIOPERATIVE RESIDENCY

Appendix C

Organization IRB Approval Letter

October 26, 2016

Johanna Stiesmeyer, DNP(c), RN, MS, RN-NC

Dear Ms. Stiesmeyer:

On October 25, 2016 a member of the Institutional Review Board (IRB) reviewed the following submission:

Project Title: [658424-1] Comparative Costs and Benefits of Registered Nurse (RN) in a Perioperative 101 Program Residency: An Immersive Perioperative (Periop) Specialty Residency (PSR) Program; and RNs Hired into the General Perioperative Setting from 2009-2016

Submission Type: New Project

Investigator: Johanna Stiesmeyer, DNP(c), RN, MS, RN-NC

Review Type: Expedited Review

Effective Date: October 25, 2016

Annual Update Due Date: October 24, 2017

Project Status: Active - Open to Enrollment

Exempt Category: 45 CFR 46.101 (b)(4)

Documents Reviewed:

- Cover letter, dated September 19, 2016
- IRB Application for a New Study
- Proposal, v2, dated May 20, 2016
- Data Collection Tools
- Letter of Support from PHS
- UNM HRRC decision letter, dated June 7, 2016
- CV, Licensure, Human Subjects Research Protections (CITI) certificate, and Financial Conflict of Interest form for Johanna Stiesmeyer and Pamela Woods

Applicable Regulatory Guidance/Waivers:

- Exempt Category 4: Research involving the collection or study of EXISTING data, documents, records, pathological specimens, or diagnostic specimens.
- Informed Consent Not Applicable
- HIPAA Authorization Addendum Not Applicable
The IRB has determined that this project is exempt from the requirements of the Department of Health and Human Services (DHHS) regulations for the protection of human subjects and the Food and Drug Administration (FDA). Exempt studies are not subject to continuing review; however, the IRB requests annual updates on the progress of your study, including but not limited to modifications to the protocol, the addition or deletion of investigators and study staff, and that you notify them when the study closes.

The IRB reviewed the study documents and agreed to code oversight to UNM Human Research Review Committee (HRRC) as the IRB of record. The research is approved to be conducted at UNM.

It is the responsibility of the Principal Investigator to inform the IRB of any changes to this project. A change in the project may disqualify it from exempt status.

The review fee has been waived.

You may contact the Human Research Protections Office at 505-841-1436 if you have any questions. Written correspondence may be sent to the IRB electronically via IRBNet Project ID # 958424.

Sincerely,

Richard Gludicce, M.D., Chair
IRB