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Optimizing Engagement in the Acute Care Setting: A Nurse Driven Staffing Model

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Optimizing Engagement in the Acute Care Setting: A Nurse Driven Staffing Model

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Abstract

Health care is on the threshold of major reform. Central to this reform will be the ability to maximize patient outcomes and resource allocation. The delivery of nursing care is essential to these concepts. Nursing care delivery impacts both patient outcomes and labor costs. Every aspect of care delivery has changed over time: length of stay, acuity, payment methodologies, documentation, technology, and regulatory requirements. Yet the model by which we allocate resources to the bedside is based on an archaic notion and forecasting model around one variable. The development of effective nurse staffing strategies will ensure those delivering care are engaged and able to meet the present day demands. Understanding the complex environment in which care is being delivered and the increasing demands put on those delivering care, Legacy Health, in Portland, Oregon, has embarked on an innovative project to redesign their nurse staffing model; building on current advancements in technology and more importantly engaging those closest to the work.

Keywords: nurse staffing, care delivery, staffing model, technology, engagement

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Optimizing Engagement in the Acute Care Setting: A Nurse Driven Staffing Model

Introduction

The delivery of healthcare in the acute care setting continues to be challenged with increased regulatory requirements, resource constraints, and ever-evolving reimbursement models. The impact of poor staffing can have catastrophic effects on staff engagement and moral, as well as, patient outcomes. As healthcare reform continues to appeal to our sense of duty to provide value and quality to our patients, while maintaining or decreasing costs, so the nursing profession must engage in the conversation and direct the model by which patients will receive care.

Background Knowledge

Overview.

Nursing labor costs are one of the largest factions of a hospital operating budget (Volpatti, Leathley, Walley, & Dodek, 2000). Current literature continues to link nurse staffing to patient safety (Baernholdt, Cox, & Scully, 2010) and outcomes. As the single largest labor cost in the acute care arena and one of the largest drivers in clinical outcomes, nursing is poised to be the focus of a value based delivery system (Harper, 2012). The complex evolution of healthcare has resulted in a system in which there is misalignment of resources and a misunderstanding of what is needed to deliver optimal care (Fitzpatrick & Brooks, 2010). The dynamic nature of nurse staffing and scheduling in the acute care arena, challenges conventional economic models related to simplistic concepts of supply and demand (Bowie, Bradley, & Fall, 2016). A staffing model that ensures organizational resources and nursing competencies are aligned with a patient's unique needs will become central to the conversation (Malloch, 2015).

Although many studies indicate that there is a positive correlation between nurse staffing and patient outcomes (Baernholdt et al., 2010; Shuldham, Parkin, Firouzi, Roughton, & Lau-Walker, 2008), the most prevalent determinant of staffing needs is based on patient volume as defined by “midnight census”. The use of this single source to quantify staffing needs and allocation of resources leads to unintentional over and understaffing (Fitzpatrick & Brooks, 2010). With healthcare moving from a volume based industry where revenue is solely generated on the numbers of patients/procedures, to one of value and limited exposure to risk/harm for the patient and the organization, measurements for determining staffing needs must address this new reality. The literature demonstrates that metrics incorporating the unique needs of the patient and family, the nursing staff’s competency level, and the capacity of the organization to support the needed resources will drive higher outcomes (Kaplow, 2003). Cited as contributors to poor work environments and burnout, nurse staffing and scheduling can negatively impact job satisfaction, staff retention, and patient outcomes if they fail to meet the needs of the patient and their caregiver (Aiken, Clarke, Sloan, Sochalski, & Silber, 2002). With the predominant model centering on a static source of volume, it is time to evaluate opportunities to better align staffing models that may positively impact patient outcomes.

The macro-environment.

With fourteen states addressing nurse staffing in hospitals, through legislation or regulations (American Nurses Association [ANA], 2015), it is imperative that the nursing community begin to actively engage in this topic. Although California remains the only state with a minimum required nurse patient ratio to be maintained at all times at the unit level (ANA, 2015), bills are continuing to be proposed by nursing unions across the country. Two house bills related to staffing were brought forward in Washington and Oregon during the 2015 legislative

cycle. In 2016, Oregon Senate Bill 469 passed after lengthy deliberations amongst nursing leaders, unions, and legislators.

Senate Bill 469 outlines requirements related to the monitoring and auditing of hospital compliance around staffing laws and staffing committees. The Bill provides strict details around: nurse staffing audit procedures, civil penalties related to nurse staffing laws, nurse staffing posting and record requirements, nurse staffing committee requirements, nurse staffing plan and review requirements, nurse staffing plan mediation requirements, nurse staffing replacement requirements, nursing staff member overtime, nurse staffing plan waiver, and nurse staffing plan during emergencies. The nursing profession has an opportunity to take this out of the hands of unions and legislators and truly own it.

The micro-environment.

Legacy Health, located in the Pacific Northwest, is a locally owned, not-for-profit, health care system with eight hospitals and 50 primary care clinics. Legacy serves the state of Oregon with three community hospitals, a children's hospital, two tertiary care centers with residency programs, and a behavioral health specialty hospital scheduled to open in January 2017. The system is essential to the region providing a Level I Trauma center, the Oregon Burn Center, and the Rehabilitation Institute of Oregon. In Washington, Legacy supports the Clark County community on the campus of its newest medical center. Employing over 3,500 nurses and managing more than 58,500 discharges annually, Legacy is a leading health care provider in the region.

The miso-environment.

Legacy's mission is "to promote good health to our people, our patients, our communities, and our world". Central to the mission is ensuring that "our people" have the

necessary tools they need to provide exceptional care to those who seek our services. Honoring the knowledge base and experience of our frontline clinicians, Legacy Health prepared to embark on a system wide process improvement project to redesign its nurse staffing model and to select and implement a staffing software system that would enhance the organization's ability to meet the volatile nurse staffing demands of its system.

Impetus for change.

Taking an innovative approach to address a long standing problem, Legacy Health embarked on a system wide process improvement project engaging frontline clinicians in the development of a nurse driven staffing model. The development of an evidence based nurse driven staffing model that aligns the complex needs of the patient, and the nurse's knowledge base and experience with the capacity of the organization to support the required resources, required a framework to support the project. Optimizing staff engagement in the acute care setting through a nurse driven staffing model, Legacy endeavors to increase value to our patients by improving outcomes and increasing patient and nurse satisfaction.

Current research on "missed nursing care" has linked inadequate staffing, as a determinant in care environments. Increases in "missed care" are tied to decreases in quality of care, as well as, decreased engagement and satisfaction of the nursing staff (Aiken, Clarke, Sloane, Lake, & Cheney, 2008). In evaluating "missed nursing care", a correlation between skill mix and staffing determinants is noted (Kalisch, Landstrom, & Hinshaw, 2009). A sense of frustration and despair is noted from nurses who report an inability to meet the needs of their patients. Unfinished or missed care is tied to negative outcomes for patients, the nurses caring for them, and the organizations they are working in (Jones, Hamilton, & Murry, 2015). Adaptive

responses in team's, demonstrates lower levels of missed care and a decrease in feelings of moral distress and dissatisfaction from the nursing staff (Jones et al., 2015).

Local Problem

Aspirational goals.

Legacy Health aspires to be an industry leader by developing a nurse driven staffing model. Within Legacy Health, there is a centralized, system wide, staffing office to help support unexpected staffing needs. The staffing office is also home to over 200 nurses who can be deployed to any hospital and unit, within their specialty, to help cover unexpected staffing shortages. Even with a shared pool of nurses, there continues to be misalignment. Each hospital and unit interprets and administers staffing guidelines based on their own individual needs. In order to protect their own self-interest, many over inflate staffing needs or are reluctant to share information regarding resources that may be available them. This sense of distrust and over protection or suppression of scarce resources, has led to inequities, inefficiencies, wasted resources, patient flow disruptions, and in some cases unsafe staffing. Legacy's goal is to utilize evidence based practice through a review of current literature and staffing guidelines to determine best practices and develop a nurse driven staffing model that utilizes data to safely provide care and influence resource allocation and waste elimination in the delivery of care to all of their patients.

Intended Improvements/Purpose of Change

Aim statement.

To develop, implement, and evaluate a framework for designing a nurse driven staffing model for an eight hospital system that optimizes frontline staff engagement and maximizes

technology to enhance the delivery of care in the acute care setting for its nurses by the end of September 2016.

Question.

Taking an innovative approach, Legacy's senior nursing leaders wanted to know three things. Would actively involving the frontline staff in the development of a nurse driven staffing model increase ownership and accountability? Would the use of Lean principles help guide the work and provide structure? Would the development of a framework to fully engage the frontline staff in the design of a nurse driven staffing model lead to increased engagement and collaborative decision making when allocating shared resources?

Review of the Evidence

In moving healthcare from a fee for service model, to one where value is the primary commodity, solving the inadequacies of the current nurse staffing model will be a fundamental component (Bowie et al., 2016). To inform this project, a systematic review of the literature was conducted. Without a gold standard to determine nurse staffing (Mensik, 2012), evaluating the current evidence related to the use of midnight census provides insight to better align nursing care and patient outcomes.

Predominant staffing model.

Midnight census is the foundation and most widely used method for calculating patient days and determining staffing needs and bed capacity (Khanna, Boyle, Good, & Lind, 2013). The utilization of midnight census implies that "volume" is the only driver for nursing supply and demand (Burdreau, Balakrishnan, Titler, & Hafner, 1999). Midnight census, does not allow for workflow considerations related to patient complexities, nurse competencies, admissions, discharges, and transfers. Addressing the relationship between the patient's unique needs and

characteristics, as well as, the competencies of the nurse, and the capacity or constraints of the system, organizations may be better prepared to align patient outcomes with nursing interventions and staffing needs (Kaplow, 2003).

The data bases searched were Cochrane, Joanna Briggs, Clinical Evidence, AHRQ Evidence Reports, CINAHL, and PubMed. The key words and subject headings: *midnight census*, *nurse staffing*, *nursing outcomes*, and *patient hours* were used to ensure information was related to the PICOT question: In adult, in-patient units (ICU and Medical/Surgical), does the use of midnight census accurately predict patient volumes and nurse staffing needs compared to the use of other methods utilizing time-weighted activities, nurse competencies, or hourly patient counts over a fiscal year? Although some of the databases did provide studies and articles related to “nursing outcomes”, the articles were not relevant to the identified question. The Boolean operator “and” was used with “midnight census” for all searches to maintain a relevant connection to the question.

A total of eight publications were related to the PICOT question. All identified publications were further analyzed to determine, relevance, validity, reliability, and applicability (Melynk & Fineout-Overholt, 2015). Six of the publications were studies related to midnight census and were critically reviewed based on their ability to directly answer the PICOT question.

Critical appraisal of the evidence.

All six studies were evaluated using Melynk & Fineout-Overholt (2015)’s Evaluation Table Template (see Appendix A). The evaluation table utilizes nine categories to assist in critical appraisal of the evidence: date of publication, conceptual framework, design method, sample setting, major variables studied, measurement of major variables, data analysis, study findings, and appraisal of studies worth to practice and strength of evidence. The use of a

standardized approach to the appraisal of evidence allows for a broader understanding of the results and provides invaluable information to determine if there are implications for a change in practice (Browner & Newman, 1987).

In 2000, Volpatti, C., Leathley, M., Walley, K. R., & Dodek, P. M., studied the use of time-weighted nursing demand compared to midnight census of nursing supply in an intensive care unit. The authors studied midnight census and how it relates to the patient population and flow complexities, in determining the staffing needs of an Intensive Care unit, in comparison to using a time-weighted demand system. The study found that the relationship between demand and nursing supply was significantly greater than that of the relationship of midnight census and nursing supply ($p < .01$). The authors conclude that the use of midnight census as a predictor of staffing needs in the ICU is limited and should not be relied upon. The study limitations of only assessing 77 consecutive days in one ICU need to be taken into consideration before generalizing to other units, hospitals or specialties.

Baernholdt, Cox, & Scully 2010 conducted a retrospective review of patient census and nurse staffing to assess the use of clinical data to better account for the actual nursing workload required to provide safe care to patients as compared to the exclusive use of midnight census. The study compared five intensive care units and thirteen medical/surgical units (over 400,000 hospitalizations spanning 14 years). The study defined “Total Patients Treated” by calculating the number of patients not admitted or discharged in a 24-hour period and those that were admitted, transferred or discharged (ADT) during that same time frame. The ratio of ADT to Total Patients Treated provided a unit activity index (UAI). The UAI accounted for increased workload required in admitting, discharging, and transferring a patient. The study compared

midnight census to Total Treated Patients noting a considerable difference in Total Treated Patients to the midnight census.

Baernholdt et al. (2010) suggests that midnight census may not be the best predictor in determining staffing needs. The study was limited to one hospital so the results cannot be generalized. The study does indicate the need to conduct further research on nursing workload and staffing accuracy to ensure patient safety.

Beswick, Hill, & Anderson (2010), completed a secondary retrospective quantitative data analysis to determine if patient volumes based on midnight census differed significantly from patient volumes counted throughout the day. The data was retrospectively collected for a two year period of time at a 350 bed metropolitan hospital. Paired t-tests were calculated between midnight census and patient census being calculated throughout the day and demonstrated a statistically significant difference in patient volumes throughout the day as compared to the midnight census. Value comparisons ranged from 0600 ($t= 3.9$, $df= 195$, $p=.001$), 1400 ($t= 3.9$, $df= 195$, $p=.0001$), and 2200 ($t= 6.2$, $df=195$, $p= .0001$). The study also evaluated the FTE projections based on intra-day patient census compared to the midnight census, with similar results ($p= 0.0001$).

The authors concluded that the midnight census underestimates the cost of nursing services and workload, and that admissions, discharges, and transfers needed to be assessed for staffing projections. Caution must be taken as this is a retrospective study limited to one hospital. The authors also admit that the design flaw of having supervisors enter the census data might lend itself to staffing bias and misinterpretation.

Simon, Yankovskyy, & Dunton (2010), evaluated biases' related to patient day data collection methods. The authors conducted a simulation study evaluating six patient day data

collection methods: M1 (midnight census), M2 (midnight census plus actual hours from short stay patients), M3 (midnight census plus average hours from short stay patients), M4 (patient days from actual hours of inpatients and short stay patients), M5 (patient days from multiple census reports), and M6 (using a noon and midnight census). M4 is the only method that calculated patient days based on actual hours of stay, making it the most accurate. The authors used M4 as the “standard” by which to measure the other five methods.

The study found that M5 and M6 have the least amount of bias and produce the least amount of outliers even when short stay patients are introduced. The authors conclude that patient census methods that include data from more than one variable, provide greater predictability. The limitations of the study are related to its simulation design and no articulated definition of short stay patients.

Simon, Yankovskyy, Klaus, Gajewski, & Dunton (2011), evaluated biases’ related to patient day data collection methods. The authors conducted a simulation study evaluating six patient day data collection methods: M1 (midnight census), M2 (midnight census plus actual hours from short stay patients), M3 (midnight census plus average hours from short stay patients), M4 (patient days from actual hours of inpatients and short stay patients), M5 (patient days from multiple census reports), and M6 (using a combination of noon census and the “standard” midnight census). M4 is the only method that calculated patient days based on actual hours of stay, making it the most accurate. The authors used M4 as the “standard” by which to measure the other five methods.

The study found that M5 and M6 had the least amount of bias and produced the least amount of outliers even when short stay patients were introduced. The authors concluded that patient census methods that include data from more than one variable, provide greater

predictability than midnight census alone. The limitations of the study are related to its simulation design and no articulated definition of short-stay patients, leaving room for interpretation.

Khanna et al. (2013) completed a retrospective observational study of 23 hospitals in Queensland Australia to evaluate the reliability of using midnight census in projecting patient volume and staffing needs. Twenty-three hospitals were analyzed for occupancy measures. The authors analyzed the midnight census in relation to peak, average, and minimum occupancy levels. The data demonstrated that a significant correlation between the midnight census and minimum occupancy levels ($p=0.99$) exists. However, there was a significant but less strong correlation to peak and average occupancy levels ($p=0.73$ and 0.95 respectively). The study noted that using midnight census to predict patient flow and capacity planning from the day before was the most significant but as the span of time was extended, there was significantly less of a correlation.

Khanna et al. (2013) recommends continued research to further determine the reliability of using the midnight census. They also encourage considering the utilization of a combination of occupancy measures when projecting patient volume and staffing needs. Caution must be taken in generalizing the results due to the retrospective nature of the study.

Each study was also assigned a category rating related to the level of evidence and quality of the study (see Appendix B) using evidence appraisal tools from Johns Hopkins ("Institute for Johns Hopkins," n.d.). All six studies were critically evaluated for relevance, reliability, validity, and applicability. The studies demonstrated relevance to the PICOT question as the interventions were better predictors of nurse staffing needs compared to the standard "midnight census". Reliability was limited due to the design of the studies and the use of unique

variables, making replication challenging. Validity was also limited as these were Level II and Level III studies. The studies are applicable to patient care as they support a move from the use of midnight census to the development of a tool to accurately account for the nurse staffing needs in relation to the nurse's competencies, the patient's unique needs and characteristics, and the organization's available resources.

Nurse staffing models must evolve to meet the demands of both staff and patients in our complex care environments (Bowie et al., 2016). With no gold standard, organizations will need to engage those doing the work to create environments in which staff can deliver high quality care and are not defeated by the overwhelming staffing and scheduling issues that plague many care environments on a daily basis (Bowie et al., 2016).

Conceptual Frameworks

The synergy model.

With current literature suggesting that an outcomes/needs based nurse staffing model, as opposed to, the more prevalently used midnight census/volume based model, may reduce misalignment in resource allocation, the synergy model, developed by the American Association of Critical Care Nurse's (AACN) was selected to guide this project. Grounding the development of the project's framework around the synergy model assisted in centering the project team's focus and goals. The foundation of the AACN's synergy model is based on optimizing patient outcomes by aligning the nurse's competencies, the patients' needs and characteristics, and the system's capacity to support the identified resources (McEwen, 2011). Originally developed in the mid 1990's (McEwen, 2011) to conceptualize a model for certified practice (American Association of Critical Care Nurses [AACN], 2015), the synergy model has been utilized in studies to guide practice and education. The conceptual framework provides a construct to

demonstrate the interconnectedness between the nurse's contribution and activities, to patient outcomes (McEwen, 2011).

The synergy model evaluates the unique characteristics that make up a patient's and or their families' capacity to optimize health and or their vulnerability to illness, as well as, a nurse's ability to meet those needs based on specific competencies. The identified patient characteristics: resiliency, vulnerability, stability, complexity, resource availability, participation in care, participation in decision making, and predictability (McEwen, 2011), are defined as minimal, moderate, or high (AACN, 2015). The nursing competencies: clinical judgment, advocacy and moral agency, caring practices, collaboration, systems thinking, response to diversity, facilitation to learning, and clinical learning are evaluated on three levels ranging from level one: competent to level five: expert (AACN, 2015).

The synergy model provides an organized structure that connects the three phenomenon essential to adequately developing an appropriate nurse staffing model (Kohr, Hickey, & Curley, 2012). By focusing decision making on the relationship between the patient's unique needs and characteristics, as well as, the competencies of the nurse, and the capacity or constraints of the system, implementation will be more successful and outcomes will more likely to be achieved (Kaplow, 2003).

Lean.

The use of Lean principles were employed to ensure a structured approach through project development, implementation, and evaluation. Although the foundation of Lean is more commonly found in the engineering industry, over the past ten years, we have seen an increase in the number of healthcare organizations choosing to utilize and adopt the core principles of Lean to achieve high quality care (Shirazi & Pintelon, 2012). The fundamental principle in Lean is to

engage and empower the frontline staff. It is the staff's role to perform problem solving. Problem solving is not exclusive to the role of the leader (Rinehart, 2013). Lean espouses to remove waste and increase value which is defined by the customer. This project utilized Lean tools (observation/engagement sessions, A-3, value stream mapping, 3P event, and rapid process improvement events) as a basis for developing a framework to engage frontline staff and leaders in the work ahead.

In Lean process improvement, the role of the leader is to support the frontline staff to ensure patient care needs can be met as efficiently and as effectively as possible (Albanese, Aaby, & Platchek, 2014). In manufacturing, Lean has proven to reduce waste and improve quality and value through tools and concepts which engage those doing the work. Many of the tools utilized in Lean have crossed over nicely to the healthcare environment. The "value" in creating a culture where quality is actively being assessed and improved upon may have a profound impact on the delivery of healthcare in America (Fall, 2016).

Methods

Ethical Issues

Moral imperative.

The obligation "to do good" manifests itself in the day to day practice of nursing professionals (Kalisch, Tschanen, & Lee, 2011). By definition, beneficence encompasses moral obligation; acts of charity and kindness (Kinsinger, 2009) and is an altruistic value found in many healthcare professionals, especially nurses (Kalisch et al., 2011). Moral anguish and or distress occurs when patient care is compromised or missed (Kalisch et al., 2011). A primary driver for missed nursing care is poor staffing resources. A predictor of staff satisfaction and improved patient outcomes is perceptions of staffing adequacy (Kalisch et al., 2011).

Although current research suggests that higher nurse staffing levels demonstrate reduced instances of missed nursing care and increased satisfaction and quality (Kalisch & Xie, 2014), it is not always feasible to increase staffing levels. Helping the team explore the scope/boundaries of their work, while focusing on the fair and equitable distribution of resources throughout the system, rather than increases in direct care hours ensured synergy and transparency amongst the team. Discussions surfaced around meeting our obligation to serve our communities as a whole, while balancing the needs of those in our care. Dialoguing opportunities to influence change for the greater good and being a part of the solution created a forum for trust and understanding. Beneficence obligates one to act when we know there is a need but coupled with that is non-maleficence: to do no harm (Angelucci & Carefoot, 2008). Supporting the team to find ethical clarity as they developed a model that would support equitable resource distribution through agreed upon staffing and scheduling guidelines, allowed the team to move closer to an ideal state.

Setting

This project engaged frontline staff and leaders from all eight Legacy hospitals. The project served to design a framework to develop a nurse driven staffing model that would empower nursing and be supported by evidence and data. The project design was to ensure high quality care while supporting and respecting the needs of those delivering the care. The organization fully committed to supporting this project both philosophically and financially.

Planning the Intervention

Through selective technology acquisition, development of evidence based staffing guidelines, and standardized education for managers, the project team leveraged the intrinsic expertise of Legacy Health's frontline nursing staff and leaders. Empowering the staff to

enhance the system's ability to respond to the volatile nature of staffing in any given unit, on any given day, will improve quality of care and staff satisfaction. Attempting to undertake a project of this scale and duration, required a deliberate and structured planning process. The planning process included a discovery period, a system evaluation, a gap analysis, an organizational structure, a financial impact review, and a communication strategy.

As the chief nursing officer (CNO) sponsor assigned to this project, my role was to outline and coordinate the planning process, as well as, design of the actual framework by which Legacy would achieve their desired goals. In large scale Legacy projects, CNO sponsors are also directly responsible for ensuring information is reported to senior leadership and that any issues, concerns, or barriers are brought forward and addressed in a timely manner.

Discovery period.

Although all 3,500 Legacy nurses would not be able to directly participate in the project, it was imperative to engage them as much as possible in the gap analysis and data gathering phase to understand their unique perspective. During the project inception, a Lean consultant was hired to help guide a gap analysis and discovery. To ensure staff were aware of the project and given an opportunity to provide feedback, seven engagement questions were developed and sessions were held at each hospital's staffing committee meeting, system wide clinical specialty group meetings, and at individual hospital sessions. The seven questions were also posted in every nursing unit within the hospitals to allow staff to write down their thoughts, ideas, and feelings. The seven questions asked: "What are the current barriers that contribute to inefficient staff scheduling (the rocks in our shoes)?", "What will the future of staffing be in 20 years?", "In terms of staffing what do we want our patients to experience?", "In terms of staffing what do we want our frontline staff to experience?", "What contributes to optimal staffing?", "In terms of

staffing, what do we not want to lose about our current work environment?”, “What will happen if we do not change?” The responses from each group were gathered and posted on the system wide intranet for staff to read and consider. A booklet was made with all responses categorized by hospital and provided to the hospital presidents and chief nursing officers.

System evaluation.

To understand the unique complexities of the project environment a SWOT analysis was completed (see Appendix C). Strengths directly related to this project are frontline staff and leadership engagement. Another strength is that all of the Legacy hospitals have site based staffing committees providing a mechanism for sharing of ideas and information. Hospital based staffing committees are required in both Oregon and Washington. These state required and legislated, staffing committees provided a structured venue to collect information and engage in dialogue with the frontline nursing staff, not only supporting the project’s needs but optimizing the intent of the committees.

Although Legacy Health enjoys many strengths, the project team noted some weaknesses. The very unique and historical cultures of each hospital and unit, lends itself to a sense of “I” as opposed to “we”. Each hospital has a tendency to view shared resources from a singular lens, creating disparities in how resources can and should be allocated. Additional weaknesses are the capital investment to purchase a software system that would meet the organization’s need, as well as, the extensive scope and sizable span; covering eight hospitals and multiple units within each hospital.

Opportunities are Legacy’s collaborative partnerships with other organizations. The system has a strong culture of collaborating with other entities. Currently the organization has collaborative agreements with three other organizations/market competitors. These agreements

range from providing contracted services to their members, collaborating on the development of the new behavioral health hospital, service arrangements increasing the communities' oncology network, and a large scale community project to help provide housing and resources to the homeless. Leveraging these collaborative partnerships has allowed the organization to learn and share best practices with our colleagues. Legacy is also one of the few organizations in the region whose nurses are not represented by a collective bargaining agreement in seven of its eight hospitals.

Threats both to the project and the organization are the attempts by unions to use “staffing” as a way to engage the public and frontline nursing staff in potentially adversarial dialogue. The recently adopted Oregon Senate Bill 469 demonstrates continued legislative interest in, and the ability to, impose limitations or regulations, which may, limit the project scope and effectiveness. Another potential threat for this project is location. With hospitals in two different states, there is the added complexity of meeting the regulatory requirements of the Oregon State Board of Nursing (OSBN), the Washington Department of Health's Nursing Commission, and state specific imposed staffing legislation requirements.

Gap analysis.

An outside Lean consultant was contracted to help lead a small team in the preparation of conducting a gap analysis. The core team was comprised of the Lean consultant and two data abstractors from the consulting firm, as well as, Legacy team members which included a senior executive sponsor, the CNO sponsor, and two Legacy frontline managers. The team gathered and reviewed data over a three month period to better understand and share information with the front line staff who would be tasked with creating the new model. The data was then shared at a

week-long event engaging over 75 frontline staff and leaders. The event was designed to foster a re-envisioning of staffing and scheduling for the Legacy system (Bowie et al., 2016).

The week-long even was called a 3P. The Japanese term for 3 P is “Kaikaku”, which stands for radical transformation. The term 3 P stands for production, preparation, and process. A 3P is a lean workshop focused on the design of something new. The foundation of the process is to support those who actually do the work to design/create a new process. Most commonly used in the design of a new space or the development of a new product, it can also be used to facilitate the creation or re-imagining of workflow/operations. The goal of the 3P was to help those doing the work, look into the future to design a process that will potentially work 20 years from now (G. Sausser, personal communication, June 15, 2015). The 3P event influenced the development of Legacy’s nurse driven staffing model. During the week long 3P event, problem analysis occurred using value stream mapping and fishbone diagrams to explore the effects people, materials, measurements, methods, machines, and the environment have on staffing. Momentum maps and creative exercises were employed to prioritize the work and to test the team’s imagination and to use experts in other industries as a guide. One of the final creative exercises was to name the project. The name “Simplicity” was chosen to exemplify the teams desire to create a model that was simplistic in nature and design.

Organizational chart.

As the CNO sponsor responsible for project design, a detailed organizational chart (see Appendix D) was constructed to provide a clear reporting structure and to ensure decisions were escalated and vetted with the appropriate governing bodies. The foundation of the Simplicity organizational chart is the frontline staff and nurse managers, information is retrieved from and given to this foundational group of stakeholders. The majority of Simplicity’s work took place

within the core work group which was made up of frontline staff and leaders. The core work group was later subdivided into special project teams that would carry out the detailed work identified during the gap analysis. Project leads were also identified to oversee components of the project: Software implementation, development of the guiding principles, development of content for baseline manager education, and communications. The core work group developed an overarching purpose statement and deliverables for each project team (see Appendix E and F)

The core work group relied upon the broad support of the site based staffing committees to gain consensus and gather feedback. The project oversight team was made up of two senior vice presidents, two vice presidents, the director of resource management, special project managers, a contracted project manager, and two information technologists. The project oversight team was established to guide the direction and order of specific detailed project work. The project oversight team reported to the steering committee which included the senior vice presidents including the system CNO, the chief nursing informatics officer, and the site based CNO's. The steering committee was responsible for the high level strategic direction of the project and was responsible for signing off on any recommendations escalated by the core work group and special project teams. The steering committee was also responsible for reporting directly to the executive committee which included the system sr. vice presidents and hospital presidents. Within the system there is a great deal of sensitivity in assuring that large scale projects have appropriate representation from all sites, disciplines, and clinical specialties. The executive committee ensured that all Legacy entities were represented.

Financial impact review.

The financial impact of Simplicity was broken down into two categories. Unbudgeted or onetime costs related to the Lean consultant, catering, staff time at meetings, planning sessions,

rapid process improvement events, and ongoing, budgeted or capital requests related to the cost of a new software system. The largest cost consideration for Simplicity was related to the software acquisition and implementation. The steering committee sought funding support from the Legacy Health executive committee and Board. The capital request was \$2,934,611.

Projected three year impact to the organization is \$5,720,178 in net cash flow expense. Payback years are greater than 10. The five year net present value (NPV) at 8% is negative \$2,880,477 (see Appendices' G-K).

Resource requirements.

The steering committee required an initial capital invest of \$2,934,611 for software acquisition and installation (see Appendix G). Other expenses related to the project are the three year maintenance contract and two year subscription fee totaling \$843,101 (see Appendix H). Additional cost to the system is related to a three year FTE and benefit expense related to the hiring of a contracted project manager and staff time to fully engage in the project development and implementation (see Appendix I).

Assumptions.

Although Simplicity requires a substantial financial investment without a reciprocal financial return, the project oversight team identified reductions in salary expense related to OT to cover open positions and salary expenses related to scheduler's time in developing the schedules on a monthly basis (see Appendix J). The time to fill open RN positions for Legacy is 53.2 days. The Pacific national benchmark is 51 days. The increased flexibility in staffing and scheduling related to the project will create a market advantage for Legacy in recruiting RNs and will have the potential to reduce "time to fill" by 5 days for 50% of the open RN positions. The

initial financial impact of this salary reduction is identified for years one and two with a tapering off in year three.

A potential salary reduction was also identified related to the actual monthly scheduling process. Units are currently spending an average of five hours per week on managing the staffing schedules. The salary impact for 47 in-patient units is significant. The project team's work around standardizing staffing principles and guidelines, as well as, establishing baseline education and expectations for managers and schedulers will provide an overall salary reduction over three years of \$1,622,551.

Break even analysis.

The three year pro forma (see Appendix K) summarizes the overall impact to the organization. The cumulative net cash flow for three years is negative \$5,720,178. Annual net cash flow of the capital investment discounted at 6.5% would provide a small positive return on our investment of \$118, 106 by year three if the organization had chosen not to fund this project. The project team and organization recognize the significant financial investment related to the software acquisition. Software purchases rarely provide a direct financial return on investment (ROI) and must be offset and or justified through cost avoidance and or improved engagement and efficiencies.

Return on investment.

Although nurse turnover and retention was not analyzed as part of the pro forma, replacing experienced nurses carries a significant financial burden for the organization (Blake, Leach, Robbins, Pike, & Needleman, 2013). The estimated replacement costs for medical nurses and those working in critical care in 2000 were estimated to be \$42,000 and \$64,000, respectively (Blake et al., 2013). The recent delay in nursing retirements related to the economic

downturn of 2007 (Auerbach, Buerhaus, & Staiger, 2014), may have given many organizations a sense of false security but current projections estimate the nursing shortage will be approximately 260,000 by 2025 (Blake et al., 2013). Although Legacy Health continues to have low turnover rates for nursing (7.2%), national trends suggest turnover has increased by 38% since 2010. Faced with the uncertainties of health care reform and the impact of a nursing shortage, capitalizing on retaining an engaged work force will be beneficial to nurse satisfaction, patient safety, and organizational security (Bowie et al., 2016).

Legacy's mission of good health for our people, our patients, our communities, and our world demonstrates the organization's commitment to those who provide care to our patients. The economic value of nursing is hidden in hours per patient day metrics limiting a nurse's value to one of cost avoidance through harm reduction and decreased readmissions (Pappas, 2015). A nurse driven staffing model that maximizes flexibility and creativity will, in turn, empower nurses to have an impact on their workload and to identify and quantify the value that they bring as individuals to the complex and diverse individuals they care for. Simplicity is seen as an investment in our organization's most precious resource.

Communication strategy.

In order to engage stakeholders and maintain project momentum, the team developed an intricate communication strategy. A designated project team from the core work group was assigned to oversee and respond to needs related to communication.

Goals of strategic messaging plan.

- A. Create brand recognition (see Appendix L)
- B. Inspire trust through consistent, transparent, and timely communication
- C. Generate shared excitement and sustained momentum

Stakeholder demographics.

Legacy Health's mission is "good health for our people, our patients, our communities our world". The decision to put "our people" first demonstrates Legacy's commitment to ensuring those closest to the day to day work are supported and valued. Simplicity focused on meeting the strategic goals of the organization, as well as, the needs of the individual stakeholders. The Simplicity communication team identified three internal stakeholder groups central to the success of this project. Simplicity's strategic messaging stakeholders are Senior Leadership (senior vice presidents, hospital presidents, and chief nursing officers), frontline nursing staff and managers, and the members of the Simplicity Core Work Group. Each stakeholder group defined and derived value from Simplicity based on their unique perspective, role in the organization, and interaction with the external environment. Appendix M stratifies the stakeholder groups and identifies proposed value propositions for each group. Although all stakeholders benefit from a nurse driven staffing model that optimizes staff engagement, Simplicity's strategic messaging centered on senior leadership's role in ensuring fiscal responsibility and their desire to eliminate waste, the core work groups need for project updates and report outs to ensure all aspects of the project are moving forward in a cohesive fashion, and the frontline staff and nurse managers need to provide input, feedback, and obtain information that will impact their day to day work.

Communication strategy.

Simplicity committed to ensuring the goals of the strategic messaging plan were met. The communication project team has provided communication that is consistent, timely, and transparent. The communication strategy leveraged diverse platforms for maximizing the needs of the stakeholder groups (see Appendix N). Platforms include: intranet, internal publications,

emails, meetings, and formal presentations. Where appropriate, all platforms leveraged the use of video (see Appendix O) or graphics (see appendix P) to generate excitement and evoke sentiment.

Implementation of the Project

Work breakdown structure.

A breakdown of the work to be completed was outlined in a work breakdown structure (see Appendix Q). The project covered five key areas of work: gap analysis, software acquisition, development of guiding principles, development of educational content, and the evaluation phase. Each key area had specific components that were completed during the implementation of the project. The work breakdown structure was used as a road map for the team. As various items were completed, the color on the work breakdown structure would be changed to green to signify completion. During the project setbacks or delays were color coded red.

Software acquisition.

During the 3P event the participants created an extensive list of criteria that would be needed to successfully transition the system and more than 50 nursing units from a hybrid system of paper and software schedules to an enterprise wide software system. Attempts to transition to a fully integrated software system in the past had been unsuccessful as the applications did not meet the needs of the end-user and created more work and subsequent work-arounds. Eighty-five individual elements were identified during the 3P event and later ranked by smaller subset of individuals representing the project oversight team and software implementation team. Requests for information (RFI's) were distributed based on the ranked criteria and vendors were brought in to demonstrate how they met the identified criteria. Vendor sessions were predominantly

attended by frontline staff and schedulers who would actively be using the system. Select leaders involved in the project, as well as information technologists (IT) and human resource (HR) partners were also in attendance. For many vendors, presenting to end-users was a new approach. Many were used to only presenting to senior leadership and were noticeably outside of their comfort zone. Having to address the questions and concerns brought forward by frontline staff, ensured that the software application of choice would truly meet the needs of the end user. After a competitive process including Requests for Proposals (RFP's), a second round of demonstrations, and aggressive negotiations, the frontline staff's first choice was selected.

Publish guiding principles.

Core to the success of the nurse driven staffing model would be acceptance and adherence to a standard set of guidelines around staffing and scheduling. A core team identified as the "guiding principles work group" took the lead in standardizing Legacy's approach to staffing and scheduling. The team reviewed all seven Legacy staffing and scheduling policies and then facilitated a three and a half day rapid process improvement (RPI) event by which the seven staffing and scheduling policies were decreased to two guidelines. The RPI included over 40 frontline staff and leaders. The team systematically addressed topics around planning and preparing a schedule and concepts related to "in the moment" or "day of" staffing. Finding agreement around sensitive topics such as holidays, vacations, and weekends, might have derailed the RPI but the team agreed to focus on the core principles of the synergy model: optimizing patient outcomes by aligning the nurse's competencies, the patients' needs and characteristics, and the system's capacity to support the identified resources (McEwen, 2011), to help make controversial decisions. By the end of the three and a half day event, two drafts were

completed and ready to be reviewed by the system chief nursing officers. An infographic (see Appendix P) was developed to share highlights of the event with the teams.

Five items that would have greater system impact, surfaced as recommendations and were assigned to a master's student to complete a review of the evidence. During the student's precepted practicum, the topics will be researched and a proposal providing: situation, background, assessment, recommendation, questions (SBARQ) will be brought to the appropriate decision makers over the next year.

Content development: Staffing 101 for leaders.

During the preparatory phase for the 3P event. A session was held to determine if all leaders, managers, financial analysts, directors, and chief nursing officers were in agreement to certain practices and or definitions. There was concern in the system that there was not common agreement or understanding around key concepts: definition of core, hiring targets, and the use of on-call staff. The session confirmed concerns. An element of the project would be to provide baseline education and tools for nursing leaders to ensure agreement on definitions and standard practices around hiring, position control and the identification of changing trends related to staffing within units/departments. Three tools were vetted and agreed upon: definition of key concepts, a position control tool, and a quarterly evaluation tool. Definition of key concepts just provides guidance and agreed upon understanding for concepts related to staffing and scheduling. The position control tool is a simple excel spreadsheet that calculates any gaps between budgeted FTE's and current hires. A quarterly evaluation tool was created to support managers in reviewing current staffing trends in their unit/department with their director or above. Although these documents were agreed upon by the "staffing 101 for leaders" project

team, final sign off was not accomplished during the project timeline and have been assigned to a Masters student and will be piloted over the next year.

Planning the Study of the Intervention

To study the intervention and gain insight into the effectiveness of the project, outcomes measures were developed based on identified gaps that surfaced during the 3P event. These outcome measures would inform the project team that the work being done was positively impacting or reducing the identified gaps. A Gantt chart (see Appendix R) was also developed noting project milestones to ensure the project remained on track and to help identify areas that might need to be modified or timelines that might need to be extended.

Initial outcomes measures were focused around the annual employee engagement survey questions related to positive perceptions around staffing, engagement, burnout, and the compromising of values. Although the project was in its early stages, the project team wanted to know if the 3P event and development of project teams led by frontline staff and managers would help improve engagement and perceptions around staffing. During the course of the project a subscale of the practice environment scale (PES) was used to evaluate perceptions of staffing and resource adequacy, a pre and post engagement question, and attendance and participation in Simplicity project teams and events was evaluated to assess momentum and sustained engagement.

Methods of Evaluation

Four tools/methods were used to evaluate outcome measures. The advisory board employee engagement and culture of safety survey, the staffing and resource adequacy subscale of the practice environment scale (PES), a pre and post engagement question, and attendance rosters to validate sustained momentum and engagement in the project.

The advisory board administers Legacy Health's annual employee engagement survey and culture of safety survey. The survey utilizes a Likert scale and is able to trend data over time and provide benchmarks from other like organizations as well as determine if changes in results over time indicate a statistical significance. The PES is 31 question survey utilizing a Likert scale to demonstrate perceptions of key domains in the nursing work environment (Lake, 2002). The validated tool evaluates five subscales related to the nursing practice environment: nursing participation in hospital affairs, nursing foundations for quality of care, nurse manager ability and leadership support of nurses, collegial nurse-physician relations, and staffing adequacy and resources. Higher scores indicate agreement that the identified elements exist in the current work environment (Lake, 2002). During the RPI event one additional pre and post survey question was asked to evaluate engagement based on the use of an RPI model for problem solving. Attendance at the 3P event, core work group monthly meetings, and project team meetings and Simplicity events were assessed to determine if the project was sustaining engagement. Simplicity's success was also be based on meeting the identified project goals and timelines.

Baseline data for the advisory board survey was collected in February of 2015. The survey received 2, 556 responses from Legacy Health's nursing staff on topics related to staff engagement and culture of safety. In January of 2016 the engagement and culture of safety survey was administered and the survey received 2,773 responses from Legacy Health's nursing staff. The January 2016 survey was administered six months into the Simplicity staffing and scheduling project.

The PES staffing resource and adequacy subscale and the Simplicity engagement question was administered prior to the RPI and immediately following. Milestones were tracked against

the Gantt chart and determined to have met the deadline. Attendance was tracked throughout the project (July, 2015-September, 2016) and evaluated.

Analysis

Outcome measures.

Simplicity's performance is listed below in relation to the identified goals.

- A.** Increase system wide positive responses by nursing to the annual culture of safety survey question: *My unit/department has enough staff by 14%* to exceed benchmark of 55% by January 2016 (baseline: 45%, target: 63%, results: 60.5%). The January 2016 results exceeded the benchmark but did not meet the desired 14% increase. Engagement did increase showed a significant increase of 12%.
- B.** Increase system wide positive responses by nursing to the annual employee engagement survey related to overall engagement by 14% to exceed benchmark of 47.4% by January 2016 (baseline: 36.6%, target: 51.2%, results: 38.8%). The January 2016 results did not meet the target or exceed the benchmark. They did demonstrate a slight improvement of 2.2%.
- C.** Increase system wide positive responses by nursing to the annual employee engagement survey question: *My organization helps me deal with stress and burnout by 14%* to exceed benchmark of 39.9% by January 2016 (baseline: 29.9%, target: 41.9%, results: 35.6%). The January 2016 results did not meet the target or exceed the benchmark but demonstrates improvement decreasing the gap to benchmark from 10% to 2%.
- D.** Increase system wide positive responses by nursing to the annual employee engagement survey question: *Over the past year I have never been asked to do something that compromises my values by 10%* to exceed benchmark of 71.3% by January 2016

(baseline: 67.3%, target: 74%, results: 68.4%). The January 2016 results did not meet the target or exceed the benchmark but did show a modest 2.9% improvement over last year.

- E.** Software acquisition and development of fiscally responsible software implementation timeline (see Appendix S) was completed by June 20, 2016, meeting the targeted deadline of July 2016.
- F.** Demonstrate a 20% increase in the PES staffing adequacy resources subscale responses based on perceptions of the RPI by July 29th, 2016. The RPI attendees responded to a four question survey using a Likert scale, indicating strong agreement, agreement, disagreement, or strong disagreement.
- 1.** Do you trust our current scheduling processes/system to provide adequate support services to allow me to spend time with my patients? Positive shift from 51% of respondents agree/strongly agree to 97% of respondents reporting agree/strongly agree.
 - 2.** Do you trust our current scheduling processes/system to provide enough time and opportunity to discuss patient care problems with other nurses? Positive shift from 54% agree/strongly agree to 100%.
 - 3.** Do you trust our current scheduling processes/system to ensure enough registered nurses to provide quality patient care? Positive shift 60% agree/strongly agree to 100% agree or strongly agree.
 - 4.** Do you trust our current scheduling processes/system to ensure enough staff to get the work done? 57% agree/strongly agree to 100% agree.
- G.** Demonstrate a 20% increase in perceptions of engagement with our current scheduling processes/system prior to Simplicity and currently with Simplicity by July 29th, 2016.

33 respondents took the pretest. 29 respondents took the post test.

Pre Simplicity: 50% highly engaged, 36% engaged, 12% not engaged, 0% despondent

Post Simplicity: 86% highly engaged, 13% engaged, and 0% not engaged or despondent

H. Guiding Principles will be published by August 15th, 2016. The guiding principle staffing and scheduling policies drafted by the end of the RPI (July 29th). They have been reviewed by the hospital based chief nursing officers and are awaiting final approval and publication.

I. Content development for staffing 101 for leaders was developed and approved by project team in late July. This deliverable did not meet the projected completion date as priorities for the project shifted to accelerate the software implementation.

J. Maintain 50% attendance or participation in work groups and process improvement initiatives related to the project as compared to the initial 75 participants at the 3P event.

a. Core work group: averages 40-50 attendees per month

b. Kickoff event greater than 100 attendees

c. RPI: averaged 32 participants per day times four days

d. Project teams have increased membership. We have not had any participants drop out. One participant is out on maternity leave but expected to return in January 2017.

Study limitations.

Each survey was evaluated by the CNO sponsor for relevance, reliability, validity, and applicability to the project. Each survey demonstrated relevance to the project intervention; optimizing staff engagement. Reliability was limited due to the design and timing of the surveys. Validity was limited in that all of the surveys would be considered non-research, based

on administration, sample size, and ability to limit other variables, therefore not generalizable to other settings. Using Johns Hopkins non research evidence appraisal tool ("Institute for Johns Hopkins," n.d.) for the purposes of this project all methods of evaluation would be considered level 5 quality improvement. All of the evaluation methods are applicable to this project as they indicate that engaging the frontline staff in problem solving increases positive perceptions of staffing adequacy and resource allocation.

Results

Program Evaluation and Outcomes

The Simplicity project has continued to maintain both staff and leadership engagement and momentum. The core work group continues to average 40-50 attendees per monthly meeting. Fluctuations in attendance are related to vacations, sick days, and site priorities. The aggressive software implementation timeline is on target and the pilot units are scheduled to begin using the new product as of December 12th, 2016. Although the outcome measures related to engagement seem to have improved with the constructs of the Simplicity project, it is important to recognize that Simplicity does not exist in a silo. During the development, implementation, and evaluation phase, other changes may have improved, enhanced, or impacted perceptions of engagement.

Implementation successes.

Major successes include maintaining a large team of actively involved nurses across eight hospitals. The willingness of the frontline staff and leaders to work collaboratively towards standardization has been impressive. The reduction of policies from 7 to 2 has been met with a great deal of support and flexibility both from a senior leadership perspective and from a frontline staff perspective. The level of trust that has been established from those not

participating closely in the project by supporting and trusting their colleagues to make difficult decisions has been inspiring. Unplanned but exciting successes are the ability to leverage the academic aspirations of our nurses who are working on their master's and doctoral degrees. Four team members have been assigned small pieces of the project that will support the overall completion of the project as well as their personal academic requirements.

Implementation challenges.

There have been numerous challenges along the way. An aggressive timeline for implementation of the actual staffing and scheduling software, role clarity, and the use of consultants to help guide/manage a project of this scale, required careful and constant coordination. The implementation timeline for the staffing and scheduling project was accelerated to meet two organizational priorities: the integration of our seventh hospital, and the opening of our eighth hospital. System wide resource allocation needed to be realigned to help support the organizational needs of our two newest hospitals creating the need to significantly advance the software build and implementation.

The organizational structure was designed to ensure alignment of purpose and to create a transparent reporting structure. Although there was clarity around the roles of the core work group, project team leads, and their members, the project oversight team had a number of executive leaders and an outside consultant as a project manager. The number of executive leaders involved in the project demonstrates Legacy's deep commitment and support but created some confusion in role clarity and who was able to make leadership decisions. Although the team worked collaboratively, the number of leaders at this level led to redundancies in reporting of information and often times delayed decision making as team members attempted to make

sure they had the appropriate sign off before sending out communications, or giving final approval on recommendations from the project teams.

Significant challenges also surfaced as resources were employed to support the project. The benefit of utilizing contracted consultants are that they have a singular focus and are not encumbered by the day to day operations of managing a unit, department, or running a hospital or health system. They are able to dedicate their time to moving the project forward. The negative to hiring consultants is that they have one focus; the project they are assigned to. Often times their timeline and schedule began to dictate the timing and scheduling of meetings and tasks. Leaders who still had operational duties to address were made to rearrange their schedules at the last minute to meet the time constraints, deadlines, and tasks based on the consultants schedule. The organizational leaders put in many long days to meet the interests of the project and the obligations of their current role in the organization. The addition of a full time senior nursing leader who has relinquished her operational duties, as a site based CNO, should help to unburden some of the day to day project duties.

Evolution of the project.

Simplicity is a large scale project that will require a multi-year focused approach to execute. The project aim to establish a framework that will serve to move this project successfully from inception to completion has evolved nicely. Nurse staffing issues have plagued the acute care setting since the beginning of time. Doing more with less is not always an option. Quality of care and quality of work life balance influence the decisions made and how they are executed. An individual's autonomy over their schedule is a very personal decision, yet it is determined in the constructs of a team and impacts the care delivery model. The sensitive nature to staffing and scheduling requires a balance between one's own self-interest and the

interest of their colleagues and the vulnerable population they serve. Being included in the conversation and the decisions that will guide how an organization standardizes and operationalizes nurse staffing and scheduling has not only engaged our frontline, it has empowered them to own the decision making process and the outcomes of those decisions.

Leadership commitment.

Legacy Health has demonstrated a substantial fiscal and personal commitment to this project. Financially they have invested in a software program that will achieve many of the criteria our frontline staff and managers deemed to be necessary to improve our ability to provide appropriate resources to our units and departments. Two senior vice presidents and two vice presidents have supported the project since its inception. All of the hospital presidents and chief nursing officers have supported frontline staff and manager participation and have funded salary expenses at the individual site level. Departments outside of nursing: IT, HR, and finance have also leveraged resources and committed to regularly participating in meetings and development sessions.

Alternative strategies.

Engaging the frontline staff and supporting them to drive change can be challenging for leaders. The process can take longer and leads to open discussions about many sensitive and controversial topics. Determining how weekends, holidays, and vacation schedules will be determined often times carries emotional baggage and personal desires. Using the more common approach where senior leadership and a small select group of individuals draft and approve policies and the selection and implementation of technologies to support practices, eliminates the need for sensitive or controversial conversations and allows the organization to move at a much faster pace. In the case of nurse staffing and scheduling, finance, quality, regulatory bodies,

labor unions, and individual staff have an interest in, and may be impacted by, the manner in which this complex issue is executed. Legacy has put a great deal of trust in those who most closely understand the complexities and who are most closely affected by the decisions and execution of a nurse staffing and scheduling model. The alternative has not been an option. It has been done in the past and has been shown to not be successful. Legacy's approach honors the expertise and professionalism of its nursing staff to design a model that will best serve the organization's mission.

Unintended consequences.

Nursing does not work in a silo. It is an interdisciplinary practice and engages with colleagues whose roles are both professional and more labor or task focused. As Simplicity has taken shape and its goals have been shared, other disciplines have shown interest in participating in a more standardized staffing and scheduling system. Although this interest and desire to participate in an enterprise wide staffing and scheduling system speaks positively of the work Simplicity has done so far, it adds an additional layer of complexity as the system/software build takes shape. In order to continue to meet the aggressive timeline set forth for the nursing division, the organization has agreed to bring on other disciplines in a structured manner and where there are large numbers of employees involved, a modified version of the Simplicity framework will be constructed to guide decision making and influence engagement and buy in. The organization and project leads have embraced this concept and the Simplicity team leads have agreed to continue to help support the work of Simplicity as it rolls out to other disciplines across the organization.

Discussion

Summary

Key successes.

To date, Simplicity is on track and has not only maintained momentum but has gained momentum as other leaders have signed on to support the project. One of our chief nursing officers relinquished her operational duties to support the project full time. The role of the CNO sponsor remains intact but now the day to day operational duties of Simplicity can be turned over to the newly assigned leader. This shift in the project structure will create greater capacity to move the project forward, while ensuring the demands of individual hospital operations are met. The project has engaged the nursing division in a positive manner and has given a platform for frontline staff and leaders to have more visibility at a higher level. The reduction in policies and guidelines has streamlined the intricacies around staffing and scheduling and has created a sense of shared ownership within our frontline managers. The collaboration within the project teams and transparency around decision-making has created a sense of trust that has been missing for some time. Frontline leaders and charge nurses have committed to full disclosure of staffing needs and available resources. In the past, teams were reluctant to disclose if they had a nurse on standby. Fearful they would not get the needed resources, units tried to protect the interests of their staff and patients by failing to fully acknowledge potential resources available to them.

Key findings and lessons learned.

One cannot underestimate the time commitment in taking on a large scale project and the additional time and effort that is needed to honor a framework in which the frontline staff and leadership are engaged and empowered to make and execute decisions. Even leveraging outside support through consultants, the organizational leaders must understand they will be taking on

additional duties while continuing to meet the normal day to day demands of their current roles. Finding creative ways to obtain feedback from all individuals who will be impacted by these decision can be challenging. Utilizing face to face meetings/town hall sessions and online surveys can give voice to the end users of the projects efforts.

Sustaining change.

Establishing a framework that provides opportunities to continually engage fresh interest and ideas helps to sustain a large scale and lengthy process. Developing multiple avenues to be involved also ensures that individuals can meet the required commitments without feeling overburdened or stressed. Ensuring the core work group is large enough to sustain the transitory needs of vacations, maternity leaves, sick days, conferences, and work obligations allows decisions to be made in a timely fashion with confidence that the represented parties have a voice at the table.

Emerging possibilities and implications for nursing practice.

It is clear the nurse staffing problem will not be solved by Simplicity alone. As healthcare continues to evolve in our ever changing political and societal environment, so too will nurse staffing and scheduling. As one of the largest labor forces in the country, nursing has yet to fully take ownership of their profession. Simply owning nurse staffing and scheduling is one way that the nursing profession can mobilize and impact healthcare. Who best to determine how deliver care and allocate resources than those who spend twenty four hours a day utilizing the model. The discussion around nurse staffing should not be at the legislative level, it should be owned by the profession and should be determined by professional bodies. Nursing has the collective expertise and drive to oversee nurse staffing issues. In doing so, nursing will positively impact quality outcomes and patient care.

The greatest impact to nursing practice is at the bedside and in the delivery of care. How resources are deployed and the manner and which those resources are optimized will not only impact quality and care delivery in the moment but may have a profound impact on recruiting others to join the profession and improve quality going forward. Although improved patient outcomes are linked to nurse staffing (Aiken et al., 2002), there continues to be debate as to how to measure the workload of nursing (Spetz, Donaldson, Aydin, & Brown, 2008). The ability to define and agree upon a single source may not be attainable due to limitations in data abstraction and data base functionality. Understanding nurse staffing patterns and their impact on patient outcomes will require continued attention and research (Spetz et al., 2008).

Dissemination plan.

Simplicity will continue to be implemented throughout Legacy Health and will slowly incorporate disciplines outside of nursing, using a modified structural format. The software venter has complimented the team on the design and inclusion of the end users from the perspective of software implementation. Recognizing the project design encompasses a much wider scope, the venter believes Legacy's approach would serve other clients, and has asked the team to consider presenting at their national conference. Portions of the project have appeared in recent publications of AONE Voice, and Nurse Leader. As Simplicity continues to evolve there will be more opportunities to share learnings with a broader audience.

It is too early to know if engagement will be sustained through the entire project roll out or if those closely involved in the project will remain as committed as they are today. Ideally portions of the project framework will be replicated with the hopes of leveraging the expertise and engagement of frontline staff in other initiatives. Inspiring frontline staff to own their

practice and to become invested in solutions that impact their day to day work sends a strong message to those considering a career in nursing and those just starting their careers.

Relation to Other Evidence

Understanding the current limitations in developing a one size fits all staffing and scheduling model (Spetz et al., 2008) and recognizing the need for further research and information sharing should compel nursing to be at the forefront of these discussions. As we continue to support and advance the academic preparation of registered nurses, we should encourage the profession to actively engage in research and best practices around this topic. Research supporting the relationship between staffing and patient outcomes (Aiken et al., 2002), should compel nursing to fundamentally drive the foundational understanding and development of nursing care delivery.

Barriers to Implementation/Limitations

Two barriers to implementation were: leadership changes and reprioritization of organizational needs. Changes in leadership have ensured undivided time and focus to the project. Unfortunately, there has been a slight shift from the original inception and purpose of the project. Recent decisions have been made outside of the normal Simplicity communication channels; missing the opportunity to include the frontline in the conversation. As the new leader gets aquatinted with the project, the team is hopeful alignment will occur.

The focus of the project itself has also shifted from its original inception to a more singular focus around software implementation. The project team will need to remain vigilant to the core values of Simplicity to ensure engagement is optimized and that the desired outcomes are not diverted by a singular focus on technology. As the first pilot units begin using the software, the hope is that the current team will re-evaluate the original purpose statements and

goals of Simplicity. The healthcare environment seems to always be in a state of flux and continual change. This persistent and prolonged state of evolution requires constant reprioritization. The priority focus of yesterday may be pushed aside to meet the demands of a new priority and or initiative.

Bias/imprecision.

It is difficult to draw concrete conclusions as to the impact simplicity has played on perceptions of staffing but the project team does recognize that the sustained participation in conjunction with the improved outcome measures seems promising. In evaluating the success of Simplicity, the team must be cognizant that those who are participating in the project might have a higher level of engagement in general and may respond more favorably to inquiries related to the project. This quality improvement project leaves room for internal bias as the constructs are not as rigid as a qualitative and or quantitative research project. Relying on the literature and expertise of others who have used similar tools must also be weighed with caution. Humans all bring prior experiences and knowledge to process improvement and research and it is important to understand that those experiences will predispose an individual to perceive outcomes favorably or unfavorably (Browner & Newman, 1987).

Interpretation

Observed vs expected outcomes.

There was congruence related to the observed and expected outcomes. Ensuring that the conceptual framework of the synergy model and Lean principles, centered Simplicity's purpose. Allowing the frontline staff and leadership to be intimately involved in the design and implementation of the nurse staffing and scheduling model at Legacy yielded positive

perceptions in engagement, culture of safety, PES, and participation. Continued momentum will need to be maintained through the project.

Project implications.

Simplicity has confirmed beliefs that our frontline should be more involved in solving issues, concerns, or opportunities that affect their day to day environment. Demonstrating trust in their ability to collaboratively address such a complex and challenging issue as nurse staffing and scheduling speaks volumes and gives Legacy Health a platform for recruiting and retaining highly qualified nurses. Inquiries from leaders at other organizations regarding the Simplicity project confirms that Legacy's innovative approach to addressing a long standing challenge in the acute care setting is perceived positively by others in the community. In time perhaps legislators, lobbyists, and union organizers will not feel the need to legislate or regulate nurse staffing and scheduling.

Conclusions

The work of nursing needs to be owned by nursing. The delivery of care to our patients through a nurse driven staffing model ensures that the nursing profession is maximizing patient outcomes by aligning the patient's unique needs with the individual nurse's competency level to provide that care, within the capacity or constraints of the system in which the care is being provided (Malloch, 2015). The development of a nurse driven staffing model will optimize engagement; encouraging nurses to have greater control over their work load and empowering them to be innovative and creative. Taking ownership of our nursing practice removes the need for unions, lobbyists, and legislators to dictate how we deliver care (Fall, 2016). As healthcare continues to reform and current models are challenged, nursing needs to

leverage its intrinsic expertise to redefine those models that impact the manner and environment in which we carry out our most basic mission.

Additional Information

Funding

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References

- Aiken, L. H., Clarke, S. P., Sloan, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job satisfaction. *Journal of the American Medical Association*, 288, 1987-1993.
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Lake, E. T., & Cheney, T. (2008). Effects of hospital care environment on patient mortality and nurse outcomes. *Journal of Nursing Administration*, 38, 223-229.
- Albanese, C. T., Aaby, D. R., & Platchek, T. S. (2014). *Advanced lean in healthcare*. North Charleston, SC: Create Space Independent Publishing Platform.
- American Association of Critical Care Nurses. (2015). The AACN synergy model for patient care. Retrieved from <http://www.aacn.org/wd/certifications/synmodel>
- American Nurses Association. (2015). Nurse Staffing. Retrieved from <http://nursingworld.org/MainMenuCategories/Policy-Advocacy/State/Legislative-Agenda-Reports/State-StaffingPlansRatios>
- Angelucci, P., & Carefoot, S. (2008, March). Working through moral anguish. *Nursing 2008 Critical Care*, 5-6. <http://dx.doi.org/>Retrieved from
- 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*, 33, 1474-1480.
- Baernholdt, M., Cox, K., & Scully, K. (2010). Using clinical data to capture nurse workload: Implications for staffing safety. *CIN: Computers, Informatics, Nursing*, 28, 229-234.
- Beswick, S., Hill, P. D., & Anderson, M. A. (2010). Comparison of nurse workload approaches. *Journal of Nursing Management*, 18, 592-598.

- Blake, N., Leach, L. S., Robbins, W., Pike, N., & Needleman, J. (2013). Healthy work environments and staff nurse retention: The relationship between communication, collaboration, and leadership in the pediatric intensive care unit. *Nursing Administration Quarterly, 37*, 356-370.
- Bowie, D., Bradley, C., & Fall, D. (2016, September). Finding solutions for the nurse scheduling problem: A process to choose software. *Voice of Nursing Leadership, 8-10*.
- Browner, W. S., & Newman, T. B. (1987, May 8). Are all significant p values created equal: The analogy between diagnostic tests and clinical research. *JAMA, 257*, 2459-2462.
- Burdreau, G., Balakrishnan, R., Titler, M., & Hafner, M. J. (1999). Caregiver-patient ratio: Capturing census and staffing variability. *Nursing Economics, 17*, 317-324.
- Fall, D. D. (2016). Earning your gait belt in lean: Stopping the line through a staffing response team. *Nurse Leader, 343-349*.
- Fitzpatrick, T. A., & Brooks, B. A. (2010). The nurse leader as logistician. *Journal of Nursing Administration, 40(2)*, 69-74.
- Harper, E. M. (2012). Staffing based on evidence: Can health information technology make it possible? *Nursing Economics, 30*, 262-281.
- Institute for Johns Hopkins nursing: Evidenced-based practice. (n.d.). Retrieved from http://www.hopkinsmedicine.org/institute_nursing/continuing_education/ebp/ebp_books_consultations.html
- Jones, T. L., Hamilton, P., & Murry, N. (2015). Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. *International Journal of Nursing Studies, 52*, 1121-1137.

- Kalisch, B. J., Landstrom, G. L., & Hinshaw, A. S. (2009). Missed nursing care: A concept analysis. *Journal of Advanced Nursing*, 1509-1517.
- Kalisch, B. J., & Xie, B. (2014). Errors of omission: Missed nursing care. *Western Journal of Nursing Research*, 34, 875-890.
- Kalisch, B., Tschanen, D., & Lee, H. (2011). Does missed nursing care predict job satisfaction? *Journal of Healthcare Management*, 56(2), 117-131.
- Kaplow, R. (2003, February). AACN synergy model for patient care: A framework to optimize outcomes. *Critical Care Nurse*, 27-30.
- Khanna, S., Boyle, J., & Good, N. (2013). Operational efficacy of the midnight census. *British Journal of Healthcare Management*, 19, 295-299.
- Kinsinger, F. S. (2009). Beneficence and the professional's moral imperative. *Journal of Chiropractic Humanities*, 16, 44-46.
- Kohr, L. M., Hickey, P. A., & Curley, M. A. (2012, November). Building a nursing productivity measure based on the synergy model: First steps. *American Journal of Critical Care*, 21, 420-430.
- Lake, E. T. (2002). Development of the practice environment scale of the nursing work index. *Research in Nursing & Health*, 25, 176-188.
- Malloch, K. (2015). Measurement of nursing's complex health care work: Evolution of the science for determining the required staffing for safe and effective patient care. *Nursing Economics*, 33(1), 20-25.
- McEwen, M. (2011). Overview of selected middle range nursing theories. In M. McEwen, & E. M. Wills (Eds.), *Theoretical basis for nursing* (3rd ed., pp. 220-247). Philadelphia, PA: Wolters Kluwer: Lippincott Williams and Wilkins.

- Melynck, B. M., & Fineout-Overholt, E. (2015). Making the case for evidenced-based practice and cultivating a spirit of inquiry. In B. M. Melnyk, & E. Fineout-Overholt (Eds.), *Evidenced based practice in nursing and healthcare: A guide to best practice* (3rd ed., pp. 3-23). Philadelphia, PA: Wolters Kluwer.
- Mensik, J. (2012). *The nurse manager's guide to innovative staffing*. Indianapolis, IN: Sigma Theta Tau International.
- Pappas, S. (2015). Nursing: Essential to healthcare value. *Nurse Leader*, 26-38.
- Rinehart, B. (2013). Applying lean principles. *Radiology Management*, 19-29.
- Shirazi, S. A., & Pintelon, L. (2012). Lean thinking and six sigma: Proven techniques in industry. Can they help health care? *International Journal of Care Pathways*, 16, 160-167.
- Shuldham, C., Parkin, C., Firouzi, A., Roughton, M., & Lau-Walker, M. (2008). The relationship between nurse staffing and patient outcomes: A case study. *International Journal of Nursing Studies*, 46, 986-992.
- Simon, M., Yankovskyy, E., Klaus, S., Gajewski, B., & Dunton, N. (2011). Midnight census revisited: Reliability of patient day measurements in US hospital units. *International Journal of Nursing Studies*, 48, 56-61.
- Simon, M., Yankovskyy, Y., & Dunton, N. (2010). Solving the mystery of patient days and midnight census. *Nursing Management*, 12-14.
- Spetz, J., Donaldson, N., Aydin, C., & Brown, D. S. (2008). How many nurses per patient? Measurements of nurse staffing in health services research. *Health Services Research*, 43, 1674-1692. <http://dx.doi.org/10.1111/j.1475-6773.2008.00850.x>

Volpatti, C., Leathley, M., Walley, K. R., & Dodek, P. M. (2000, December). Time-weighted nursing demand is a better predictor than midnight census of nursing supply in an intensive care unit. *Journal of Critical Care, 15*, 147-150.

Supporting Documents

Appendix A

Evaluation Table: Adopted from Melnyk, B. M., & Fineout-Overholt, E. (Eds.). (2015)

Citation: Authors, Date of Publication and Title	Conceptual Framework	Design Method	Sample Setting	Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence
Volpatti, C., Leathley, M., Walley, K. R., & Dodek, P. M. (2000, December). Time-weighted nursing demand is a better predictor than midnight census of nursing supply in an intensive care unit.	No conceptual or theoretical framework was used to guide this study	Non Experimental	77 patient days were evaluated in one ICU unit	IV= midnight census DV=actual patient hours	Univariate correlation coefficient was analyzed using a two tailed z test with a level of significance of 0.05	The correlation for nursing demand and nursing supply was statistically significant using actual patient hours $r^2=.83$ ($P<.0001$) compared to the use of midnight census	Midnight census does not reflect true nursing workload or staffing needs compared to time weighted demands Midnight census does not capture the true complexity of the work performed	Demonstrates similar results to previous studies Has the potential to influence practice One ICU unit Level III/B: Good
Baernholdt, M., Cox, K., & Scully, K. (2010). Using clinical data to capture nurse workload: Implications for staffing safety.	No conceptual or theoretical framework was used or sited, the study was guided by the IOM "Future of Nursing" report	Quasi Experimental Retrospective	Data was abstracted from Hospital and Clinical Data Repository containing > 4000,000 hospitalizations over a 14 year period in one hospital	IV= midnight census DV1=full time patients (on unit for full 24 hours) DV2=ADT (numbers of admits, transfers, and discharges) DV3=total treated patients, DV4=Unit activity	Dependent variables were evaluated against the independent variable over time by year, and by time of day, and day of week	Comparison of dependent and independent variables was reviewed to test the hypothesis	Midnight census is not the best predictor of staffing needs or nurse workload	The study demonstrates similar results to other studies and may influence practice Large sample size and time span but limited to one hospital Findings support the IOM recommendations to incorporate ADT and workload in staffing models as well as involving

				index (ratio of ADT to total treated patients)				direct care nursing staff in determining appropriate staffing Level II/B: Good
Citation: Authors, Date of Publication and Title	Conceptual Framework	Design Method	Sample Setting	Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence
Beswick, S., Hill, P. D., & Anderson, M. A. (2010). Comparison of nurse workload approaches.	No conceptual or theoretical framework guided the study	Quasi Experimental Retrospective Quantitative	Primary data set: patient counts collected over a 2 year period Secondary data set patient volumes collected throughout the day	IV= midnight census DV=intra-day patient census	Paired t test	Statistical significance was demonstrated on all shifts when ADT was accounted for	Midnight census underestimates nursing workload/staffing and may not be the best predictor for costing out nursing care	Demonstrates similar results to previous studies Has the potential to influence practice Sample size limited to two units at one hospital Data collection completed by unit supervisors possibly introducing bias Level II/B: Good
Simon, M., Yankovskyy, Y., & Dunton, N. (2010, February). Solving the mystery of patient days and midnight census	No conceptual or theoretical framework was used to guide the study	Non Experimental Simulation Study	Average surgical unit with 225 patient days	IV=M1: midnight census DV1= M2: midnight census + actual hours DV2= M3: midnight census with average hours DV3=M4: patient days from actual hours DV4= M5: patient days	Side by side and whisker plots for methods biases	Data collection methods demonstrated variances in bias distribution with static collection methods demonstrating the greatest biases	M1 and M2 have the greatest variation and an underestimation of patient days M4 and M5 have the least amount of biases	Simulation study of only one unit type included Although results similar to previous studies/design limitations would make it less reliable at influencing practice Level III/C: Low Quality

				from multiple reports				
Citation: Authors, Date of Publication and Title	Conceptual Framework	Design Method	Sample Setting	Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice Strength of the Evidence
Simon, M., Yankovskyy, E., Klaus, S., Gajewski, B., & Dunton, N. (2011). Midnight census revisited: Reliability of patient day measurements in US hospital units.	No conceptual or theoretical framework guided this study	Quai Experimental	262 units from 54 hospitals over 7 randomly selected days in September 2008	IV=M1: midnight census DV1= M2: midnight census + actual hours DV2= M3: midnight census with average hours DV3=M4: patient days from actual hours DV4= M5: patient days from multiple reports	Bayesian Regression Analysis Interclass correlation based on one way effects was calculated to estimate agreement between routine data to investigate agreement between census collection methods Regression analysis was also conducted	Data collection methods demonstrated variances in bias distribution with static collection methods demonstrating the greatest biases	M1 and M2 have the greatest variation and an underestimation of patient days M4 and M5 have the least amount of biases	Demonstrates similar results to previous studies Has the potential to influence practice Units were clustered within hospitals Level II/B: Good
Khanna, S., Boyle, J., Good, N., & Lind, J. (2013). Operational efficacy of the midnight census.	No Conceptual or theoretical framework was used to guide the study	Retrospective Observational Study	Data was abstracted from 23 public hospitals in Queensland Australia over a 2 ½ year period	IV= midnight census DV= hourly occupancy to determine daily peak, minimum, and average	Pearson Product moment correlation Linear regression models		Midnight census correlates to minimum occupancy and demonstrates reliability in predicting occupancy over a period of less than 24 hours. Midnight census does not correlate to average and peak occupancy and does not perform	Demonstrates similar results to previous studies Has the potential to influence practice Large sample size, mix of large and small hospitals including urban and remote settings

							well as a predictor of workload and nurse staffing needs over > 24 hours period.	allows for replication Level III/ B: Good
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Appendix B

Evidence Based Practice Synthesis and Recommendation Tool: Adopted from the “Institute for Johns Hopkins Nursing”

Study	Category Level	Quality Rating	Synthesis of Findings
Volpatti, C., Leathley, M., Walley, K. R., & Dodek, P. M. (2000)	Level III	B: Good	midnight census does not reflect true nursing workload or staffing needs compared to time weighted demands midnight census does not capture the true complexity of the work performed
Baernholdt, Cox, & Scully (2010)	Level II	B: Good	midnight census not the best predictor in determining staffing needs
Beswick, Hill, & Anderson (2010)	Level II	B: Good	midnight census underestimates nursing workload needs
Simon, M., Yankovskyy, Y., & Dunton, N. (2010)	Level III	C: Low	midnight census alone is not a good predictor of nurse staffing needs
Simon, Yankovskyy, Klaus, Gajewski, & Dunton (2011)	Level III	C: Low	midnight census alone is not a good predictor of nurse staffing needs
Khanna, Boyle, & Good (2013)	Level III	B: Good	midnight census as a predictor of nursing needs for low occupancy and within the last 24 hours shows some correlation but as a predictor for future or extended planning the correlation was less significant

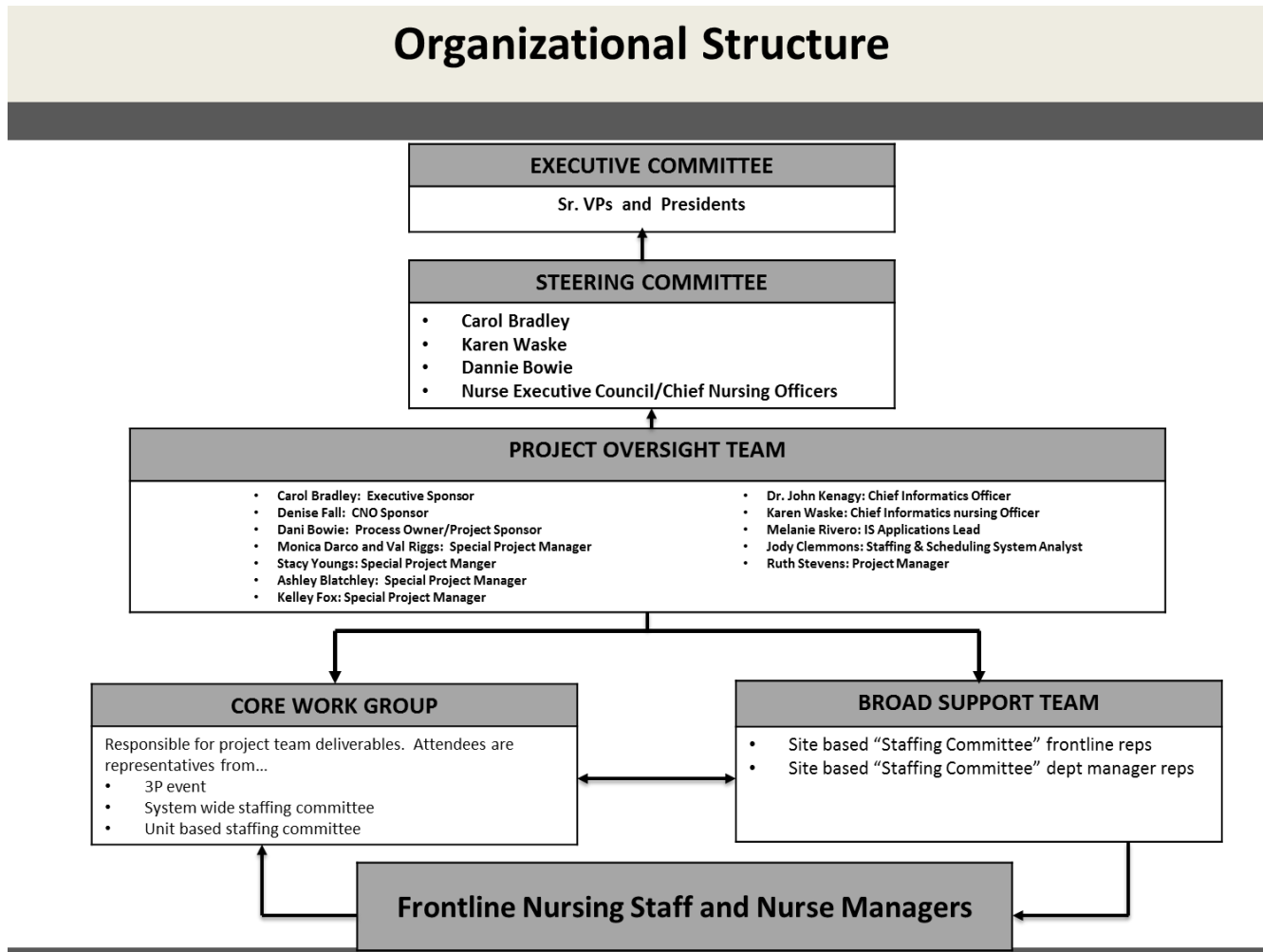
Appendix C

SWOT Analysis

<h3>STRENGTHS</h3>  <ul style="list-style-type: none">• Frontline staff and leadership engagement• Site based staffing committees	<h3>WEAKNESSES</h3>  <ul style="list-style-type: none">• Eight hospitals with very unique cultures• Significant capital investment• Large scale project (extensive span/scope)
<h3>OPPORTUNITIES</h3>  <ul style="list-style-type: none">• Collaborative partnerships with local healthcare organizations• 7/8 hospitals not represented by a collective bargaining agreement for nurses	<h3>THREATS</h3>  <ul style="list-style-type: none">• Staffing issues can be used by unions and legislators to rally staff and public opinion• Oregon Senate Bill 469• Hospitals in two different states

Appendix D

Simplicity Organizational Chart



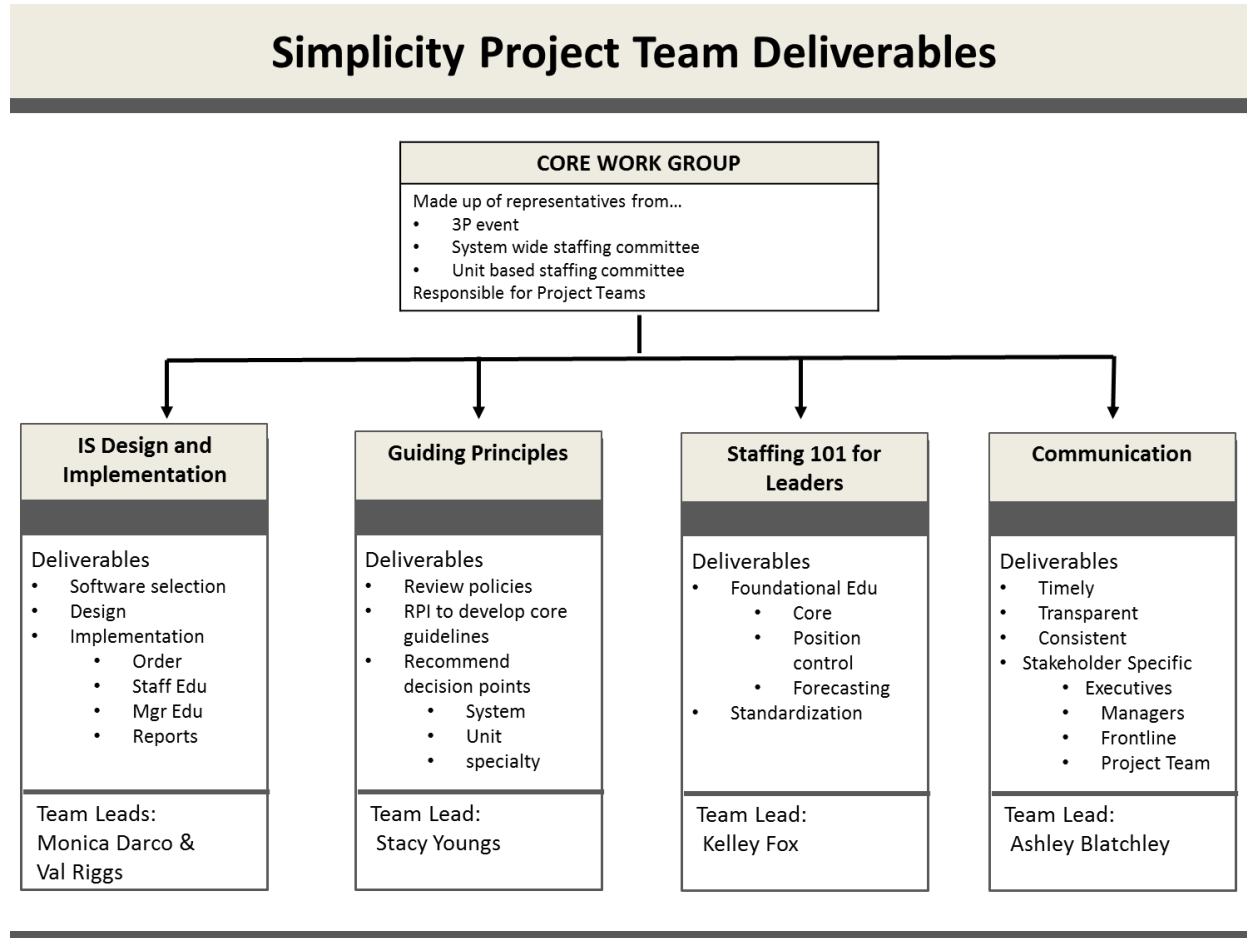
Appendix E

Simplicity Purpose Statement

“Simplicity” Core Work Group	
Mission	Our mission is good health for our people, our patients, our communities, our world
Purpose	<p>The Simplicity Core Work Group is a collaborative, interdisciplinary group working towards creating transparent and equitable staffing and scheduling practices. Due to the dynamic nature of staffing and scheduling, we will strive to create balance, flexibility, standardization, and simplicity to promote excellent patient care and outcomes.</p>
Principles	<ul style="list-style-type: none">• Simplicity: Leverage technology and standardization to enhance professional practice and engagement.• Accountability: Promote ownership by committing to the development of reliable staffing and scheduling practices.• Dynamic: Create responsive processes that promote flexibility and optimizes care through the continuum.• Innovative: Engage in forward thinking, futuristic, creative ideas that are driven by evidenced based practice; leading to measurable outcomes.

Appendix F

Simplicity Project Team Deliverables



Appendix G

Simplicity Capital Expense

<u>Capital Purchase and Depreciation Expense</u>							
◆ Capital Investment is related to software acquisition							
Description		Quantity	Item	Capital Cost	Depr. Life	Depr. Exp	
1. API Software		1		\$ 2,934,611	3	\$ 978,204	
				<u>\$ 2,934,611</u>		<u>\$ 978,204</u>	

Appendix H

Simplicity Other Expenses

<u>Other</u>							
◆ Annual maintenance contract and subscription fee							
				Year 1	Year 2	Year 2	
Maintenance contract				\$ 258,210	\$ 265,956	\$ 273,935	
Subscription Fee (2 year subscription)				-	22,500	22,500	
Total Other Expenses				<u>\$ 258,210</u>	<u>\$ 288,456</u>	<u>\$ 296,435</u>	
Projected annual inflation on other expense per FY 17 budget assumption							<u>3.0%</u>

Appendix I

Simplicity FTE Expense

<u>Paid FTEs/Salaries and Benefits</u>						
35 frontline staff participating in monthly meetings and two week long rapid process improvement projects for year one and two. 35 frontline staff participating in monthly meetings for year three. Contracted project manager for first two years of implementation.						
♦						
Positions Year 1		FTE	Hourly Rate	Salary	Benefit Rate	Benefits
Frontline Staff on Project Teams		0.63	\$ 43.00	\$ 56,347	30.1%	\$16,977
Contracted Project Manager		1.00	\$ 120.00	249,600	0%	\$0
Total		1.63		\$ 305,947		\$ 16,977
Positions Year 2		FTE	Hourly Rate	Salary	Benefit Rate	Benefits
Frontline Staff on Project Teams		0.63	\$ 44.29	\$ 58,038	30.1%	\$17,487
Contracted Project Manager		1.00	\$ 123.60	257,088	0%	\$0
Total		1.63		\$ 315,126		\$ 17,487
Positions Year 3		FTE	Hourly Rate	Salary	Benefit Rate	Benefits
Frontline Staff on Project Teams		0.40	\$ 45.62	\$ 37,956	30.1%	\$11,436
Total		0.40		\$ 37,956		\$ 11,436
Projected annual inflation on salaries & wages expense per FY17 budget assumptions						<u>3.0%</u>
Employee benefits at a % of salaries and wages per FY17 budget assumptions						<u>30.1%</u>

Appendix J

Simplicity Reduction in Salary Expense

♦ Reduction in Salary Expense						
Current time to fill is 53.2 days. Pacific national benchmark is 51 days. If time to fill open RN positions is reduced by 5 days x 132 (total open positions=264) positions, OT costs would be reduced by (\$43x1.5= \$64.5-43=\$21.5x12 hours shift=\$258 x 132 shifts= \$170,280.						
Units are spending an average of 5 hours per week building a schedule for 47 units. If this was reduced by 50% the system would have an additional reduction in salary expense of \$262,730 in the first year of implementation of the new software and we would expect these savings to continue going forward.						
		Year 1	Year 2	Year 3		
Reduction in OT Hours		(7,920)	(7,920)	(3,960)		
Incremental OT Rate		\$ 21.50	\$ 22.15	\$ 22.81		
OT savings		\$ (170,280)	\$ (175,428)	\$ (90,328)		
Reduction for scheduling		(6,110)	(6,110)	(6,110)		
Rate of pay		\$ 43.00	\$ 44.29	\$ 45.62		
Creating schedules		(262,730)	(270,612)	(278,738)		
Salary savings		\$ (433,010)	\$ (446,040)	\$ (369,066)		
Benefits		30.0%	30.0%	30.0%		
Benefits		(\$129,903)	(\$133,812)	(\$110,720)		
Total Savings		\$ (562,913)	\$ (579,852)	\$ (479,786)		

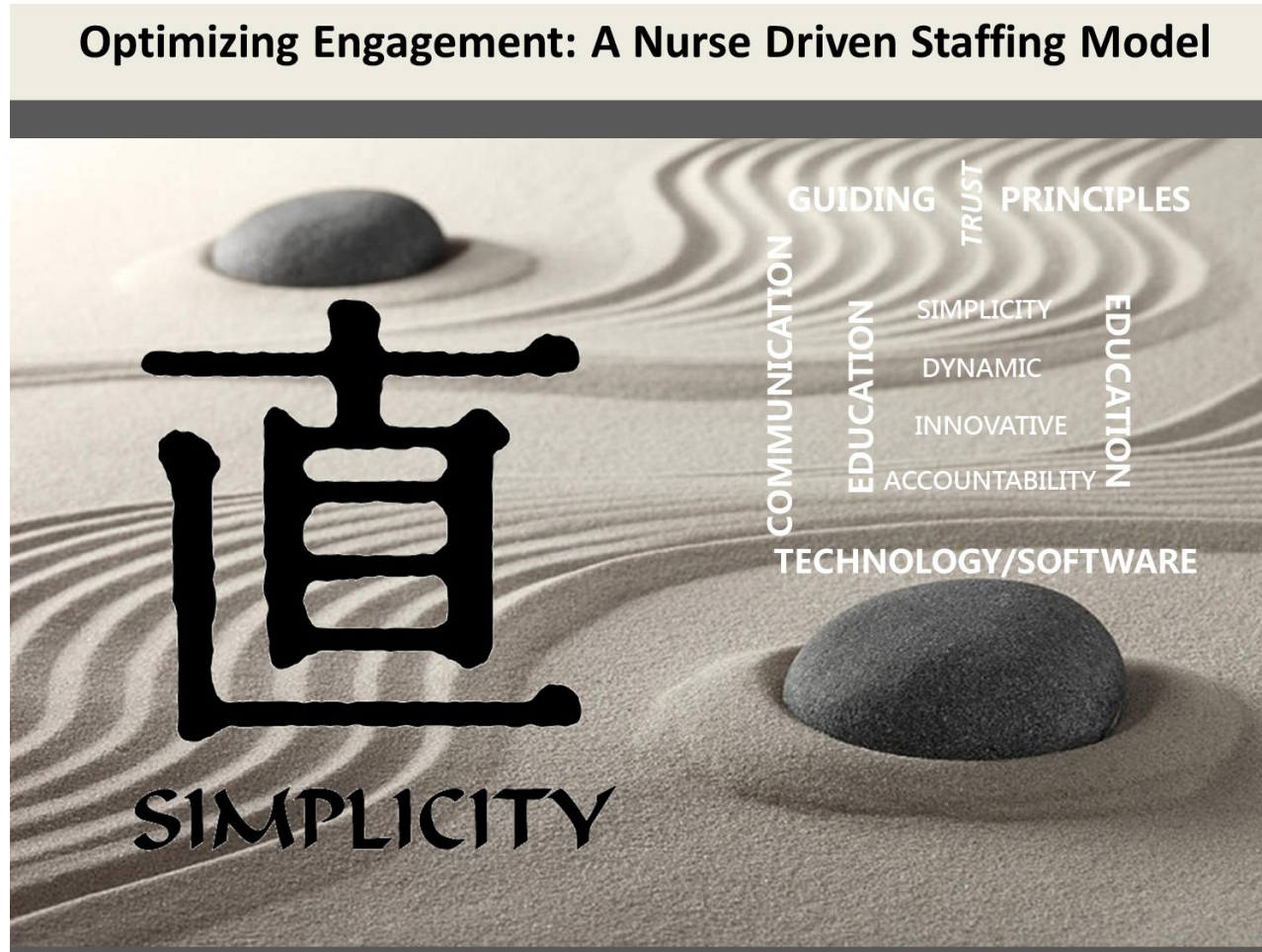
Appendix K

Simplicity 3 Year Pro Forma

		Year 1	Year 2	Year 3	Total
Paid FTEs		1.63	1.63	0.40	3.66
Gross revenue		\$0	\$0	\$0	\$0
Revenue deduction		-	-	-	-
Net Revenue		-	-	-	-
Reduction in salary expense		(562,913)	(579,852)	(479,786)	(1,622,551)
Salaries & wages (new FTE)		305,947	315,125	37,956	659,028
Employee benefits		16,977	17,487	11,436	45,900
Depreciation		978,204	978,204	978,204	2,934,612
Other expenses		258,210	288,456	296,435	843,101
Total Expense		996,425	1,019,420	844,245	2,860,090
Contribution to HOH		(996,425)	(1,019,420)	(844,245)	(2,860,090)
Net Contribution		(\$996,425)	(\$1,019,420)	(\$844,245)	(\$2,860,090)
Capital Investment	\$ (2,934,611)	\$ -	\$ -	\$ -	\$ (2,934,611)
Cash Flow from Oper.		(996,425)	(1,019,420)	(844,245)	(2,860,090)
Add Depreciation		978,204	978,204	978,204	2,934,612
Annual Net Cash Flow	(2,934,611)	(18,221)	(41,216)	133,959	(2,860,089)
Discounted at 6.5%	(2,873,426)	(18,221)	(38,700)	118,106	
Cumul. Net Cash Flow	\$ (2,934,611)	(\$2,952,832)	(\$2,994,048)	(\$2,860,089)	(\$5,720,178)
Total Project Cost			\$ 2,934,611		
5-Year Profit Margin			#N/A		
Payback (years)			10.0	years plus	
5-Year NPV at 6.5%			\$ (2,880,477)		
5-Year IRR			#N/A		

Appendix L

Simplicity Branding



Appendix M

Simplicity Stakeholder Stratification

Stakeholder	Demographics Organizational Perspective	Information Needs	Messaging Tactics	Value Proposition
Sr. Leadership	<ul style="list-style-type: none"> • Organizational oversight • Accountable for meeting strategic goals • Accountable for return on investment 	<ul style="list-style-type: none"> • High level updates • Milestone completion according to timeline • Issues or concerns that might derail or increase the cost of the project 	<ul style="list-style-type: none"> • Formal presentations • Overview of messaging plan to the rest of the stakeholders and organization 	<p>ROI</p> <ul style="list-style-type: none"> • Decreased premium pay • Decreased turnover • Increased Engagement • Improved resource allocation • Competitive advantage
Frontline Nursing Staff and Managers	<ul style="list-style-type: none"> • Delivery of care to patients • Day to day resource allocation • Emotional due to the sensitive nature of scheduling 	<ul style="list-style-type: none"> • Timely communication related to project progress • Information related to workflow changes or adjustments • Ability to provide input 	<ul style="list-style-type: none"> • Intranet (access information on demand) • Publications that provide topical information • Email updates using easy to read dashboards highlighting upcoming changes or events related to the project • Q&A 	<ul style="list-style-type: none"> • Simplicity in staffing and scheduling • High value on work life balance • Ability to be planful about time off • Trust that there will be enough staff to provide safe care
Simplicity Core Work Group	<ul style="list-style-type: none"> • Accountable for project deliverables • High desire to provide product that will improve the working environment for their teams 	<ul style="list-style-type: none"> • Clear expectations related to deliverables • Milestone updates • Project team updates 	<ul style="list-style-type: none"> • Email • Meetings with formal report outs by group leaders and project teams 	<ul style="list-style-type: none"> • Desire to have influence over workload • Ability to improve missed nursing care • Desire to meet the needs of their colleagues • Opportunity to participate in a system wide project • Increased visibility

Appendix N

Simplicity Communication Strategy

Communication Strategy

STRATEGIES	PURPOSE	INTENDED RESULTS	COMMUNICATION TEAMS ROLE	FREQUENCY
INTRANET “Just for Nurses” web page	Allow for individual access at their own pace Provide open transparent access to information to a wider audience	Maintain branding integrity Centralize access to information Keep individuals and stakeholders groups in formed. Generate excitement and maintain project momentum	Ensure content is accurate and up to date. Ensure dashboard has timely updates Maximize branding opportunities	Bi-weekly
INTERNAL PUBLICATIONS “Nursing Matters”	Provide a venue for more in-depth information/articles related to project and the evidence driving recommendations /decisions	Inform frontline nursing staff and nurse managers on topics related to the project. Provide a platform to share relevant evidence behind project Maintain interest and momentum	Write and submit articles Engage frontline nursing staff and project team members to write articles Ensure publications are relevant to the project and address interest	Bi-monthly
EMAILS	Allow for mass communication alerting stakeholder groups of new postings to intranet Means of communication to core work group related to project deliverables	Ability to communicate to broader audience Vehicle for timely communication and response to project team needs	Create consistent titling in subject line for ease of use by target audience Maintain clear, consistent, and timely communication to project team members	Weekly or more often as needed
MEETINGS	Provide a venue to share information in a more personal venue Allow for questions, answers, and dialogue Venue for core work group to provide report outs and work on deliverables	Stakeholder groups will have an opportunity to have issues or concerns addressed Opportunity to broaden Simplicity’s perspective by listening to a broader audience Dedicated time for core work group to work on deliverables and receive report outs from project teams	Assist in setting up meetings or venues Research opportunities where a personal dialogue may be needed Provide communication to relevant stakeholders meeting dates, times and locations	Monthly: Core Work Group Bi-monthly Nurse Executive committee Quarterly: Sr. Leadership Ad Hoc: frontline nursing staff
FORMAL PRESENTATIONS	Maximize branding Generate excitement Provide an engaging venue to update stakeholder groups	Inform and engage stakeholder groups Sustain momentum for project Venue for increased exposure to presenting for project team members	Assist in developing content for presentations Assist in presenting	Quarterly: Sr. Leadership Quarterly: Site based staffing committees

Appendix O

Simplicity 3P Video

<https://youtu.be/EsD7C2cjCX4>



Appendix P

Simplicity RPI Infographic

Optimizing Engagement and Work Life Balance

Building Principles
 Education
 Accountability
 Technology/Software
 Communication
 Dynamic
 Innovative
 Education

直
 SIMPLICITY

Simplicity
 Rapid Process
 Improvement
 Event
 July 26th-July 29th 2016

LEAN Used to Identify and Remove Waste

Recommendations will be pced

Number of Policies Reduced...
 7 to 2

Leveraging expertise, creativity, and technology

Demographics
 Simplicity RPI Attendees by Site

Site	Attendees
LEH	5
LEL	4
LMP	5
LMM	5
ESC	5
ROK	4
LPH	2
Unit	1
RP	2
SD	4

Demographics
 RPI Attendees by Role

Role	Attendees
Unit Secretary	1
Manager	8
Frontline RN	9
ANM	10
Staffing Office	3

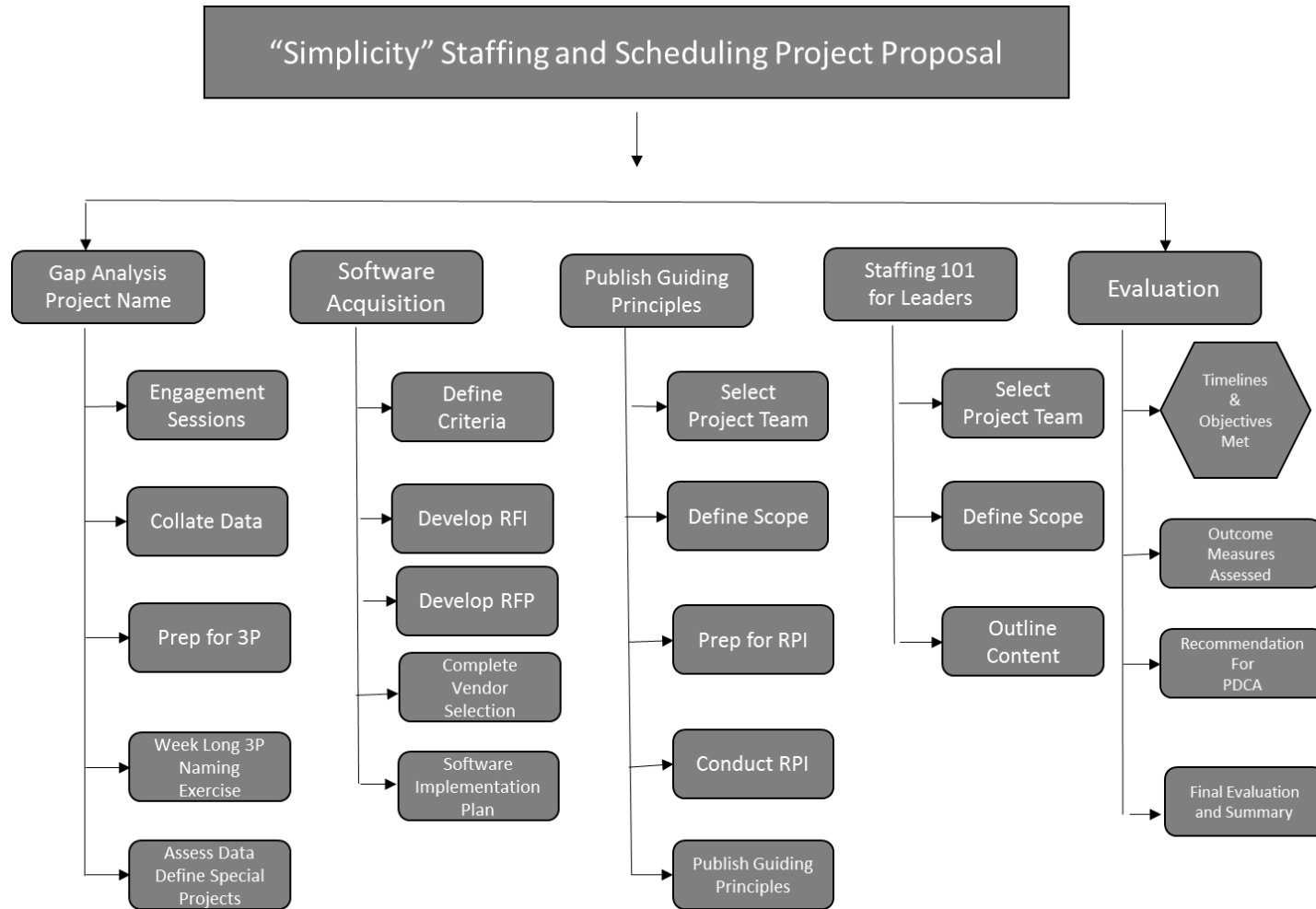
Creating a Competitive Advantage

Decisions Categorized Based on...
 Unit - Specialty - System

Top Priority:
 Staff and Patient Engagement

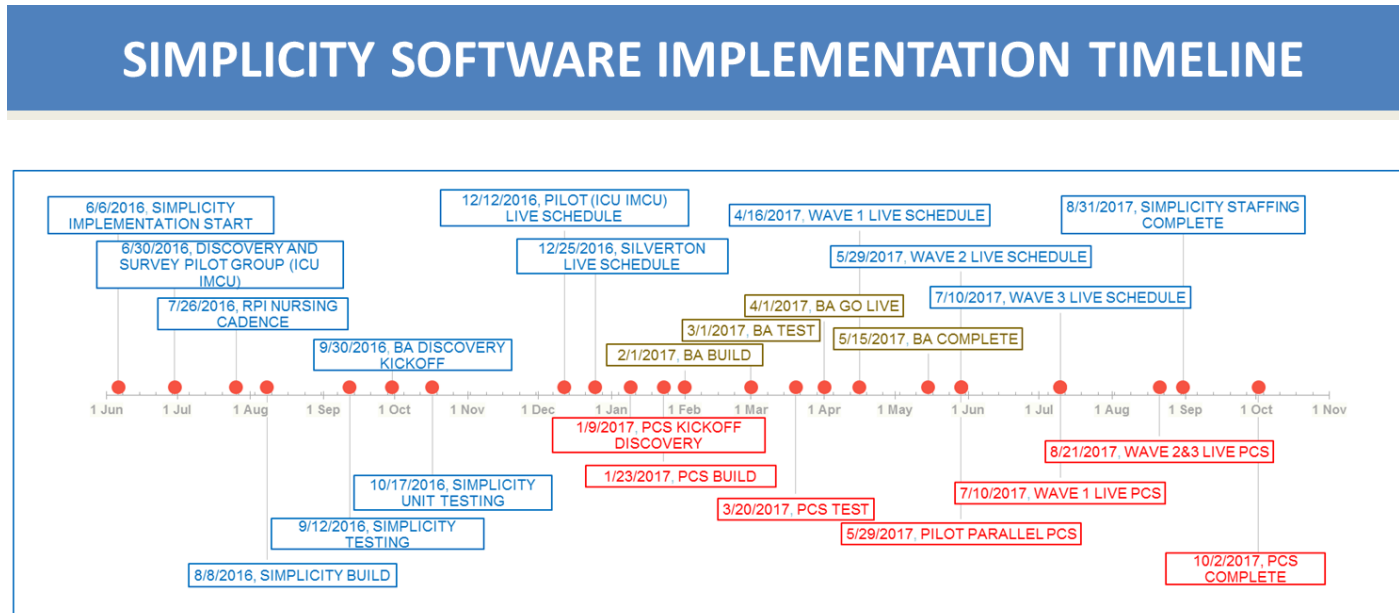
Appendix Q

Simplicity Work Breakdown Structure



Appendix S

Simplicity Software Implementation Timeline



Simplicity Staffing - Key Dates	Patient Classification – Key Dates	Business Analytics – Key Dates
12/12/16 ICU IMCU Pilot Go Live	01/09/17 Kickoff Discovery	9/30/16 Discovery Kickoff
12/25/16 Silverton Go Live	01/23/17 PCS Build	2/1/17 BA Build
04/16/17 Wave 1 Go Live (TBD Units)	03/20/17 PCS Test	3/1/17 BA Test
05/29/17 Wave 2 Go Live (TBD Units)	05/29/17 Pilot ICU IMCU Go Live	4/1/17 BA Go Live
07/10/17 Wave 3 Go Live (TBD Units)	07/10/17 Wave 1 Go Live	5/15/17 BA Complete
	08/21/17 Wave 2&3 Go Live	

Appendix T

Signed Statement of Determination

UNIVERSITY OF School of Nursing and
SAN FRANCISCO Health Professions

DNP Project Approval Form: Statement of
Determination Student Name: Denise D. Fall

Title of Project:

Optimizing Engagement and Work Life Balance Through a Nurse Driven Staffing Model

Brief Description of Project:

A) Aim Statement: To develop, implement, and evaluate a system wide, nurse driven staffing model for a six hospital system, that maximizes frontline engagement, optimizes work life balance, and utilizes data to match the unique needs of the patient to the individual nurse and the team by the end of September 2016.

B) Description of Intervention: Utilize Lean principles and tools (rapid process improvement, 3P, and Kaizen events) to develop staffing guidelines and principles for a six hospital system that are generated by those closest to the work (frontline nursing staff and nurse managers). The project will also involve developing criteria for selection of a software system that will support the identified needs of the nursing staff and organization, as well as, basic education for nurse managers and assistant nurse managers related to common understandings/definitions around core staffing, productivity, and hours per patient day. Pilot hospitals/units will be selected to complete small tests of

staffing model will incorporate nurse competencies, the patient's unique needs and characteristics, with the organization's ability to support he needed/identified resources.

C) How will this intervention change practice? This project will eliminate the current state of six hospitals and individual units interpreting and administering staffing guidelines based on their own individual needs. The current state has created inequities, inefficiencies, wasted resources, patient flow disruptions, and in some cases unsafe staffing. Engaging the frontline nursing staff in the development of staffing guidelines and principles will maximize "buy in" and create consistency and a system approach to resource allocation. Developing criteria required of the new staffing software system will increase compliance and end user satisfaction.

D) Outcome measurements:

Project implementation will be completed by June of 2016 with final evaluations completed/submitted by September of 2016.

Increase system wide positive responses by nursing to the annual culture of safety survey question: *My unit/department has enough staff* by 14% to exceed benchmark of 55% (baseline: 45%, target: 63%) by September of 2016

Increase system wide positive responses by nursing to the annual employee engagement survey related to overall engagement by 14% to exceed benchmark of 47.4% (baseline: 36.6%, target: 51.2%) by September of 2016

Increase system wide positive responses by nursing to the annual employee engagement survey question: *My organization helps me deal with stress and burnout* by 14% to exceed benchmark of 39.9% (baseline: 29.9%, target: 41.9%) by September of 2016

Demonstrate 80% compliance by frontline nursing staff and nurse managers in utilization of new staffing software system by September of 2016

Note: The annual culture of safety survey and employee engagement survey will be sent out in March (2016), with results being distributed in late May 2016. A smaller "check in" survey can be distributed off cycle if needed to assess process improvement projects.

OPTIMIZING ENGAGEMENT IN THE

ACUTE CARE SETTING:

UNIVERSITY OF
SAN FRANCISCO

School of Nursing and
Health Professions

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:

<http://answers.hhs.gov/ohrp/categ,ories/1569>

X This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

Ⓜ This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

Instructions: Answer YES or NO to each of the following statements:

Project Title:	YES	NO
Optimizing Engagement and Work Life Balance Through a Nurse Driven Staffing Model		
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	X	
The specific aim is to improve performance on a specific service or program and is a part of usual care. ALL participants will receive standard of care.	X	
The project is NOT designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does NOT follow a protocol that overrides clinical decision-making.	X	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does NOT develop paradigms or untested methods or new untested standards.	X	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does NOT seek to test an intervention that is beyond current science and experience.	X	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	X	
The project has NO funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	X	

The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., not a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	X	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: <i>"This project was undertaken as an Evidence- based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board"</i>	X	

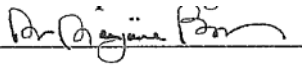
ANSWER KEY: If the answer to ALL of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. IRB review is not required. Keep a copy of this checklist in your files. If the answer to ANY of these questions is NO, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

STUDENT NAME (Please print): Denise D. Fall

Signature of Student: *denise d fall* DATE 8/1/15

SUPERVISING FACULTY MEMBER (CHAIR) NAME (Please print): Dr. Barter

Signature of Supervisor: 

DATE 8/3/201

Appendix U

Organizational Letter of Support



Legacy Salmon Creek Hospital

2211 N.E. 139th St. Vancouver, WA 98686

LEGACY

H E A L T H

October 12, 2015

To Whom It May Concern:

Denise Fall has received permission from Legacy Health to use the organization's name and location for purposes of academic writings and manuscript submissions related to her DNP project: Optimizing Engagement and Work life Balance: A Nurse Driven Staffing Model. The Senior VP and Chief Nursing Officer will have an opportunity to review any manuscripts submitted for publication prior to submission for final approval.

Sincerely,

A handwritten signature in cursive script that reads "Carol Bradley".

Carol Bradley MSN, RN, CENP

Sr. VP. CNO
Legacy Health
cbradley@lhs.org

