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Nurse's Perception of Safety Culture and Patient Safety following Implementation of a Handoff Communication Process between Pre-operative and Operating Room Nurses

Tracy Willett, MSN, MBA, RN, NEA-BC, CNOR
George Washington University

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Nurse's Perception of Safety Culture and Patient Safety following Implementation of a Handoff Communication Process between Pre-operative and Operating Room Nurses

Tracy Willett

The George Washington University School of Nursing

DNP Project Primary Advisor: Dr. Karen Kesten

DNP Project Second Advisor: Dr. Patricia Quinlan

Title:

A Project Presented to the Faculty of the School of Nursing

The George Washington University

In partial fulfillment of the requirements

For the Degree of Doctor of Nursing Practice

By

Tracy Willett, MSN, MBA, RN, NEA-BC, CNOR

Approved:
Karen S. Kesten, DNP, APRN, CCNS, CCRN-K, CNE, FAAN
DNP Primary Advisor

Approved:
Patricia Quinlan, PhD, MPA, CPHQ
DNP Second Advisor

Approval Acknowledged:
Director DNP Scholarly Projects

Approval Acknowledged:
Assistant Dean for DNP Program

Date: 4/22/2020

Table of Contents

Abstract 6

Introduction 8

Background and Significance 8

Practice and Policy 8

Needs Assessment 9

Organizational Barriers and Facilitators 9

Problem Statement 11

Purpose Statement 11

Practice Question 13

Aims and Objectives 13

Review of Literature 14

Search Strategy 14

Synthesis 14

EBP Translation Model 17

Implementation Process 17

Methodology 19

Setting 19

Analysis of Mission, Vision, and Values 19

Study Population 20

Subject Recruitment 20

Consent Procedure 20

Risks/Harms 21

Subject Costs and Compensation……...…21

Study Interventions……21

Procedure……...…23

Outcomes to be Measured…….….23

Project Timeline……24

Resources Needed……..24

Evaluation Plan……..25

Data Analysis, Maintenance & Security……25

Implications……..…….27

Practice……...27

Healthcare Policy……...27

Executive Leadership……27

Quality/Safety…..……..…27

Sustainability & Future Scholarship……..…28

Summary……28

References……..30

Appendices

A. SWOT Analysis…...……....34

B. Evidence Table…..……35

C. IOWA Model of EBP...……..……..43

D. Consent……....44

E. Lesson Plan.……46

F. Survey Questions……47

G. Timeline……...48

H. Data……..49

Abstract

Background

In a hospital environment the care of the patient is transferred multiple times during his or her stay. Current needs assessment indicates that nurses' perception of safety culture with handoff communication and patient safety is an area of focus for the practice site.

Objectives

This study aimed to improve the Pre-operative and Operating Room nurses' perception of safety culture measured with four valid and reliable survey questions. The second study's aim was to improve patient safety with the handoff process, measured by the number of adverse events reported by the practice site.

Methods

Pre-implementation data was collected. Nurses worked collaboratively to update the handoff tool which was presented at committees for review and approval. The tool was implemented and post-implementation data was collected.

Results

A total of 87 pre-intervention surveys and 76 post-intervention surveys were collected. Chi-square analysis was used and the results revealed a statistically significant improvement in the perception of safety culture for nurses. The analysis of the number of reported adverse events after implementation revealed an increase of 1, which is not a result of the new handoff communication.

Conclusions

A new handoff tool was implemented and the results of the survey revealed a statistically significant improvement in the perception of safety culture for nurses. It is important to note that

100% of respondents gave their unit a safety grade of acceptable or higher on the post-survey. Annual monitoring will include reviewing future safety culture surveys and tracking the number of adverse events quarterly.

DNP Project Proposal

The DNP project was the implementation of a new handoff communication tool at the practice site to improve the safety culture of the nurses in the Pre-operative (Pre-op) and Operating Room (OR) units by evaluating the safety culture survey results for handoff and transitions dimension to measure nurses' perceptions of safety culture pre and post-implementation and improve patient safety by tracking the by adverse events reported to New York Patient Occurrence Reporting and Tracking System (NYPORTS). The handoff communication tool is used when patient care is transferred from the Pre-op nurse to the OR nurse. The practice site uses the IOWA Model of evidence-based practice (EBP) and this framework was used to guide the DNP project. The results of the literature review synthesis was used to support the implementation of the new handoff communication tool with the implementation plan.

Background and Significance

Evidence supports ineffective handoffs can lead to adverse events, including increased length of stay and costs (Poletick & Holly, 2010). Understanding the best practice in communication in relation to using standardized handoff tools is essential to nursing practice (Poletick & Holly, 2010). In a hospital environment the care of the patient will be transferred multiple times during his or her stay. A handoff will occur when the patient is transferred from one level of care to another, when the health care provider is on a break, or relieved for the day. The purpose of the handoff communication intervention is to ensure patient safety. Current surveys indicated that nurses' perception of safety culture with handoff communication and patient safety is an area of focus for the practice site.

Practice and Policy

The intervention included the development, implementation, and evaluation of the new handoff communication tool for nurses in the electronic medical record (EMR) which was developed with the goals of improving the nurses' perception of the safety culture and improving patient safety. Compliance with the use of the tool is mandatory and built into the policy on handoff of patient care. Leadership, which includes the DNP student, education staff, and front-line staff were included on the policy revision team.

Needs Assessment

There were a total of 40 adverse events reported between 2014 and 2019 which resulted in the perioperative units' evaluation of tools to improve communication with team members. A needs assessment at the practice site revealed that staff in the Pre-op and OR units verbalized the need to revisit the handoff tool currently being used to improve how information is shared and communicated during the patient's transfer of care. An interdisciplinary perioperative team consisting of nurses, Physician Assistants, Surgeons, and Anesthesiologists identified the need to revise the handoff tool for nurses in the Pre-op to OR units. A review of the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture noted that the overall key dimension of handoffs and transitions was one of the lowest scores in the units. The use of a handoff communication tool intervention compared against the customary practice was measured to improve the nurses' perception of safety culture concerning the handoff process. The second goal of the handoff tool was to improve patient safety by reducing the number of adverse events reported to NYPORTS during the two months post-intervention when compared against the number of reported events two months pre-intervention.

Organizational Barriers and Facilitators

Strategic planning can be halted without buy-in from the stakeholders. An important step in obtaining support included the consideration of the organization's history when the strategic plan was developed. The organization is successful due to the culture which is still a focus as they expand and develop the strategic plan. Mohammad, Golmohammadi, Nekooeezadeh, and Mansouri (2017) noted that "culture forms the foundation of strategies and affects the elements of the communication process and strategic relationships". The strategic plan at the practice site is aligned with a culture that encourages staff and supports buy-in with the growth and expansion of the organization.

Internal stakeholders of the practice site included the employees, managers, surgeons, and board of directors. External stakeholders at the practice site included consumers/patients and regulatory agencies. The mission, vision, and values are the cornerstone of the organization which guides staff members with knowing what is expected of them. Gurley, Peters, Collins, and Fifolt (2015) noted that "core values statements articulate the shared beliefs of an organization". The protocols at the practice site help to differentiate the organization from others. Leadership communicates to staff members how to drive improvements and help achieve goals.

The staff are engaged and involved in the improvement processes and how they care for patients. New staff members at the practice site are selected not only for their skill set but also for their attitude. Staff selection is important to continue the strong culture of caring and dedication as the organization continues to grow. Potential barriers include lack of knowledge of EBP process, lack of organizational support, and perceived challenges to implementing changes in practice. Organizational support was obtained, then training/education workshops were developed, and competencies were built to measure the success of the education (Appendix A: SWOT Analysis).

The implementation of Epic, the EMR, a couple of years ago helped improve communication, visibility of physician orders, and the ability to easily retrieve information. Providers can access the chart and easily look-up information on office and surgery visits, radiology images, lab results, and consults. The use of one EMR for patient care has streamlined care and almost eliminated the use of a paper chart at the practice site. The handoff between the OR RN and Pre-op RN is included in the EMR with a sign off requirement from both providers.

Problem Statement

"The Joint Commission's (TJC) sentinel events database includes reports of inadequate handoff communication causing adverse events, including wrong-site surgery, delay in treatment, falls, and medication errors" (Sentinel Event Alert, 2017). Miscommunication during patient handovers can have negative patient consequences, including death (Wilson, 2007). The purpose of a standardized handoff tool is to provide a consistent method of communication for health care providers. TJC highlighted a standardized approach to handoff communication in the National Patient Safety Goals (Handoffs & Signouts, 2019). Organizations should have a standardized approach for handoff communication that includes the ability of the nurses to ask and respond to questions (Caruso, 2007). The handoff tool at the practice site is a guide for the conversation between the nurses which includes the ability to update the EMR if needed.

Purpose Statement

The purpose of the project was to improve Pre-op and OR nurses' perception of safety culture with handoff process and patient safety with a decrease in the number of adverse events reported through NYPORTS with an intervention of a revised handoff communication tool in the EMR when compared against the customary handoff process for two months pre and post-implementation. The project used a Likert scale to measure the clinical nursing providers' answers to questions regarding the nurses' perception of the safety culture based on handoff

communication before and after the intervention. The survey questions are from the AHRQ Hospital Survey on Patient Safety Culture and only included the dimension of handoffs & transitions (AHRQ, 2019). The survey was given to the clinical nurses' in the Pre-op and OR units before the intervention and two months after the introduction of the handoff intervention.

The project site reports adverse events via the NYPORTS website. The Department of Health (DOH) defines an adverse event as "an unintended and undesirable development in an individual patient's condition which occurs in an Article 28 Hospital" (DOH, 2018). Examples of included events are wrong side/wrong patient/wrong procedure surgery, unintended retention of a foreign object, and serious injury or death. According to DOH (2017) hospitals have an occurrence rate of 6.12 occurrences per 10,000 discharges in 2016 which has increased from the 2014 rate of 4.93 occurrences per 10,000 discharges. The rate of reported adverse events to NYPORTS was compared for two months pre-intervention and two months post-intervention. The project built upon previous research and contributed toward the nursing professional body of knowledge by focusing on the nurses' perception of safety culture and examining the rate of adverse events before and after the implementation to identify potential benefits of the new handoff communication tool.

Malley, Kenner, Kim, and Blakeney (2015) noted that "complexity of the perioperative environment is information-intensive" and "handoffs or transitions in care are particularly prone to information loss". Patient safety is a risk in the perioperative area from a communication breakdown, an increased workload and competing tasks (Malley, Kenner, Kim, and Blakeney (2015). Johnson, Logsdon, Fournier, & Fisher (2013) commented that "communication of essential information during the transfer of patient care from one perioperative care provider to another is critical to patient safety and continuity of care" and "the leading cause of reported

sentinel events in the OR is communication breakdown". Canale (2018) conducted a study that noted an increase in the perception of patient safety after the implementation of a standardized handoff procedure in the perioperative environment.

Practice Question

P: Pre-op and OR clinical nurses

I: a new handoff communication tool

C: customary handoff tool

O: nurses' perception of safety culture measured by handoffs & transitions dimension survey with handoff process and patient safety measured by number of adverse events reported

T: during the two months post-intervention

How do Pre-op and OR clinical nurses using a new handoff communication tool compared to those with a customary handoff tool perceive safety culture as measured by handoffs & transitions dimension survey with handoff process and patient safety measured by number of adverse events reported during the two months post-intervention?

Aims and Objectives

The intervention to develop a new handoff communication tool for Pre-op and OR nurses in the EMR was used to improve the nurses' perception of safety culture and improve patient safety by measuring the number of adverse events reported. Nurses' perception of safety culture was measured by the handoffs & transitions dimension survey which was distributed before implementation and two months post-implementation. Patient safety was measured through the number of reportable adverse events reported via NYPORTS two months before implementation and two months after implementation of the revised handoff tool.

The goal was that the use of the new handoff communication tool when compared against the customary practice will improve the nurses' perception of the safety culture and decrease the number of NYPORTS reportable adverse events. Monitoring includes the use of the handoffs & transitions dimension survey to measure nurses' perception of the safety culture pre and post-implementation. Quality management provided the number of adverse events reported to NYPORTS to track patient safety.

Review of Literature

Search Strategy

The literature search included a search for English-language peer-reviewed articles using ProQuest, EBSCOhost, CINAHL, and Pubmed using the time frame of the last ten years from March 1, 2009 through March 1, 2019. The search will include a review of the articles listed in the reference section of the articles. The search included the following combination of search terms: communication (MeSH term), hospital (MeSH term), nurse, handoff, hand over, change of shift, safety and outcomes. The results of the ProQuest search yielded a total of 517 articles, the EBSCOhost search provided 17 articles that were reviewed. The CINAHL search yielded 21 articles and the PubMed search yielded a total of three articles.

Synthesis

A total of ten research studies and two non-research studies were appraised from the search to focus on the practice gap related to the handoff of patient care from the pre-operative nurse to the OR circulating nurse in the perioperative environment (Appendix B: Evidence Table). The research was evaluated from a variety of settings (medical centers, pediatric units, medical-surgical units) and results included measurements of safety culture ratings and/or sentinel/adverse events once there was a change in the handoff process (Canale, 2018; Tidwell, et. al, 2011; Usher, Cronin, & York, 2018; Randmaa, Mårtensson, Leo Swenne, & Engström,

2014; Christie & Robinson, 2009; Johnson, Logsdon, Fournier, & Fisher, 2013). AORN (n.d.) described that the movement to improve communication at the time of handoff was driven by studies that revealed that a lack of effective communication resulted in the majority of avoidable adverse events.

There were a variety of survey tools used to measure the staff perception of safety culture including the "Examining Transfer of Care Processes in Nurse Anesthetist Practice" (Canale, 2018) and the Medical Intensive Care Unit Shift Report (Usher, Cronin, & York, 2018). All of the studies involved the use of a standardized checklist for handoff of patient care except for Tidwell, et. al, (2011) and Malley, Kenner, Kim, and Blakeney (2015) and Link (2018) noted the benefits of using standardized communication techniques. Four of the studies used bedside reporting but this is not seen as a valuable option in the perioperative environment (Hada, Croyer, & Jack, 2018; Tidwell, et. al, 2011; Usher, Cronin, & York, 2018; Walsh, Messmer, Hetzler, O'Brien, & Winningham, 2018). Sample sizes did vary with most of the studies having smaller sample sizes but that is likely limited to the size of the nursing unit where the study is being conducted. All except one of the studies included nurses (Telem, Buch, Ellis, Coakley, & Divino, 2011) and all the patients were adults except for one pediatric hospital (Tidwell, et. al, 2011). Most of the studies were not blinded which resulted in a lower rating when grading the quality of the studies. Each study used a different method to measure safety culture sin3ce there isn't one standard tool to measure it. There is the possibility that other activities on the unit also had an impact on improving the safety culture of the staff.

Research specific for patient handoff for Pre-op nurses to OR nurses were not isolated and included only other practice areas. This study focused on the practice gap related to the handoff process between the Pre-op nurses and OR nurses by measuring safety culture and

patient safety. Research questions examined safety culture and/or adverse events to determine if the change in handoff process had an impact on these measurements and only one study examined both measurements in the perioperative environment (Johnson, Logsdon, Fournier, & Fisher, 2013). Studies from other units were examined to identify measurements and interventions to improve handoff for clinical providers including the use of adverse events (Canale, 2018; Hada, Croyer, & Jack, 2018; Randmaa, Mårtensson, Leo Swenne, & Engström, 2014; Christie & Robinson, 2009; Telem, Buch, Ellis, Coakley, & Divino, 2011; Johnson, Logsdon, Fournier, & Fisher, 2013). Patients are vulnerable when they are entering the OR and it is likely that the patient will not be able to verbalize their needs once they receive medication/anesthesia in the operating room (Canale, 2018). The handoff from the Pre-op nurse to the OR nurse is critical to ensure that the patient is cleared for surgery and ready to proceed to the operating room.

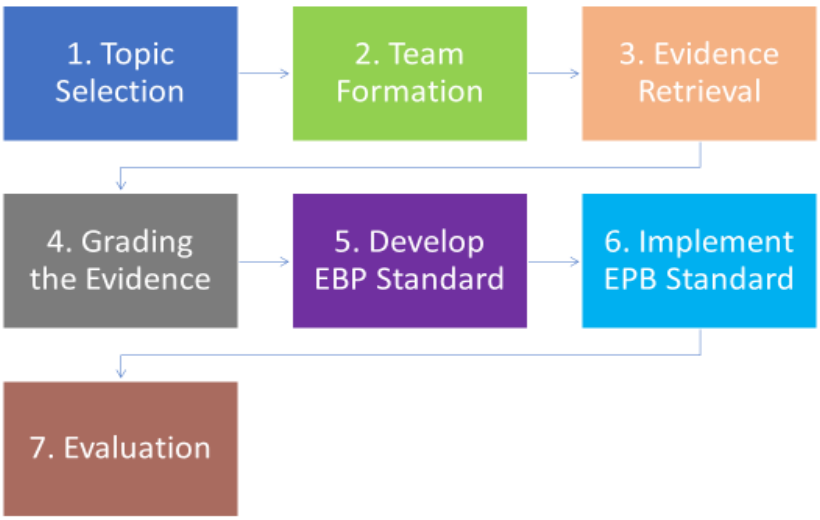
According to the literature review of the twelve articles selected, some of the potential benefits of improving handoff communication include improved safety culture and decreased errors based on the results of the studies (Canale, 2018; Tidwell, et. al, 2011; Usher, Cronin, & York, 2018; Randmaa, Mårtensson, Leo Swenne, & Engström, 2014; Christie & Robinson, 2009; Johnson, Logsdon, Fournier, & Fisher, 2013). According to Malley, Kenner, Kim, and Blakeney (2015) “communication breakdown, information loss, and increased workload and competing tasks pose the greatest threats to perioperative patient safety”. Information from the studies reviewed were used to guide this study by examining the perception of safety culture and patient safety. A survey was selected to measure the safety culture of the units along with a method to collect and measure adverse events at the facility site. An updated handoff checklist for the Pre-

op nurses to OR nurses was implemented in the EMR to improve the safety culture of the nurses and decrease the number of adverse events in the perioperative environment.

EBP Translation Model

The practice site utilizes the IOWA Model of EBP as its framework. A group of nurses from the University of Iowa Hospitals and Clinics and the College of Nursing developed this framework called the Iowa Model of Research-Based Practice to Promote Quality Care to guide clinicians in evaluating and infusing research findings into patient care (Titler et al., 2001). This model was based on Martha Roger's nursing theory, Diffusion of Innovations. Appendix C: IOWA Model of EBP contains the IOWA Model algorithm, which is clear and easy to follow. The Iowa Model focuses on organization and collaboration incorporating conduct and use of research, along with other types of evidence (Titler et al., 2001).

Below are the 7 steps to the IOWA Model (Titler et al., 2001):



Implementation Process

The Iowa Model starts with a problem or knowledge-focused trigger. Titler et al. (2001) lists the problem-focused triggers as risk management data, process improvement data,

internal/external benchmarking data, financial data, and identification of clinical problems. The knowledge-focused triggers are new research or literature, national agencies or organizational standards and guidelines, philosophies of care, and questions from the institutional standards committee. The next step is a decision point, if this is a priority for the organization, a team should be formed. Otherwise, consider other triggers until a priority is identified. Next is the search for research and related literature. Systematic reviews can save time by compiling and reviewing multiple research studies and summarizing the results. The researcher can use the systematic review to discover the findings based on the work of independent research expert. All research should be critiqued to determine that it is not flawed.

Titler et al. (2001) discuss the possible use of additional sources, including case reports, expert opinion, scientific principles, theory, and bibliographies of integrative reviews. Additional sources include abstracts published as part of conference proceedings, master's theses and doctoral dissertations, direct written or verbal communication with scientists investigating the topic and with others who have completed a research utilization project on the same topic. These are alternate methods described in the Iowa model for EBP including conducting a small study before implementing any changes. After the change is piloted, the decision must be made if it should be adopted into practice. If the practice change is instituted the process needs to be monitored and the results reported. Cullen and Adams (2010) describe that it may be beneficial to use the organization's librarian to help locate information and that more research may be needed to justify a change in practice if sufficient evidence is not available.

If there is a sufficient research base or after the other research is conducted the change in practice will be piloted. Titler et al. (2001) lists the six steps to the pilot as select outcomes to be achieved, collect baseline data, design EBP guidelines, implement EBP on pilot units, evaluate

process and outcomes, and modify the practice guideline. If the change is not appropriate for practice, the quality of care and new knowledge needs to be re-evaluated until an appropriate change is identified. The appropriate change should be instituted as a permanent change in practice. Stichler (2011) describes how leaders must embrace organizational change and guide others to adopt changes. The final step is to monitor and analyze structure, process, and outcome data, and disseminate the results. The data could include metrics on the environment, staff, cost, and patient, and family. This will help track the success of the practice change, which can be measured on a monthly or quarterly basis.

Methodology

Setting

The study was conducted at a 205-bed specialty surgical not for profit hospital in the northeast which currently performs over 30,000 surgical procedures annually. The practice site currently has a total of 39 ORs in the main hospital with an even mix of ambulatory and inpatient patients. The organization consistently looks for ways to operate efficiently as they grow and expand.

Analysis of Mission, Vision, and Values

Williams Jr., Morrell, and Mullane (2014) noted that "practicing managers can unlock the power of the mission statement by involving the entire organization in the mission statement process, clearly and consistently communicating the mission's tenets, setting measurable operational targets from the mission statement, and periodically revising the mission to ensure it is current". Strategic planning can benefit any organization and it includes numerous steps including "clarification of the mission, vision, and values, environmental assessment, strategic issue identification, strategy formulation, implementation, and assessment" (Hu, Kapucu, & O'Byrne, 2014). Benefits and advantages are numerous and Hu, Kapucu, and O'Byrne (2014)

noted that they include "clarifying the direction of the organization, improving performance, building teamwork and expertise, solving problems, and decision making". An organization needs to incorporate strategic planning as it works to improve performance and continue to grow. Strategic thinking is on another level and the focus is more creative than strategic planning. Mohammad, Golmohammadi, Nekooeezadeh, and Mansouri (2017) define strategic thinking as a "systematic analysis of the current status and future direction of its formulation."

Study Population

The study population included the clinical nurses in the Pre-op and OR units on the fourth floor/main surgical units. It was open to all staff members who have worked there at least six months and who participate in direct patient care. There are 16 pre-op nurses and 90 operating room nurses who were eligible to participate in the survey.

The learners consist of registered nurses working on two different units in the hospital. Over 90% of the nurses employed on these units have a bachelor's degree in nursing and 30% have a specialty certification. The organizational culture at the hospital has the patient at the center of care with a focus on quality outcomes.

Subject Recruitment

The subjects were recruited using the practice site email that was sent by the doctoral student at the George Washington University (GWU). The email included that participation is voluntary and confidential. A link using survey monkey was used to collect the information for the pre and post-intervention survey with a reminder email to encourage participation. A paper survey was also offered to employees and distributed during the in-service time to encourage participation. Demographic information and questions addressing safety culture were included in the survey.

Consent Procedure

The email (Appendix D: Consent) was sent to all eligible RN's in the Pre-op and OR units and it included a link to the survey. The informed consent included risks and benefits to the participants, that they do not have to participate and can opt-out at any time. The survey was confidential and was not linked to the email. An alternative option to the electronic participation was a printed survey with the same informed consent and questions for nurses. The paper survey was collected by the doctoral student and was entered with the survey monkey data collected.

Risks/Harms

There was minimal risk to the participants other than that the subject topics or questions may make them feel uncomfortable. Participation in the survey did not have an impact on their employment at the practice site. The participant was allowed to skip any question or opt-out at any time to minimize the risk. The survey included the collection of demographic information and every effort was made to keep the participants information confidential. Minimal demographic information was collected to protect the participants in the event of a breach with the collected information.

Subject Costs and Compensation

Costs of the survey included compiling the information, printing surveys, and minimal use of time for the employee to complete the pre and post-implementation surveys. Employees who participated were able to access the survey via the intranet/internet. Subjects were not compensated for participation in the study since it was confidential. The doctoral student used survey monkey to develop and send out the email with the link and information. Education costs included the use of in-service time to educate the staff. Printing material costs included surveys and tip sheets that were readily available for all staff.

Study Interventions

Nurses and management worked collaboratively to update the handoff tool used by nurses for patient handoff. This was accomplished through the use of meetings with the champions from each unit with staff members for additional clinical input. Beta testing of the tool was conducted over four weeks to include clinical nurse's feedback. Information Technology (IT) was included in the design and recommended changes to the EMR to ensure the feasibility of the updated tool. The tool was presented at Perioperative Informatics Committee and the Perioperative Practice Council for review and approval.

The policy was updated to include the use of the new handoff tool and sign-off by the providers. All policies are updated by perioperative leadership, clinical educators, and front line staff members and then presented at the Perioperative Practice Council at the practice site. The council allows for shared governance at the facility site and the policy was approved and signed off by nursing leadership. All policies are available on the intranet for staff to access.

Education about the use of the new handoff tool included multiple methods for the learner. Providing education and supporting nurses is aligned to improve the safety culture of the nurses with the use of the updated handoff tool. Education was provided by the clinical education specialists during the in-service time on the units, tip sheets on how to use and document using the new handoff tool in the EMR along with newsletters were distributed and posted for all staff members. The objectives for the in-service education (Appendix E: Lesson Plan) included that the registered nurse would be able to identify how to use the new handoff communication tool in the EMR, the benefits of the updated handoff tool, and the updated policy. There was time allotted for questions from the clinical nurses and demonstration of the use of the new tool was displayed during the in-service. Perioperative leadership was present at the in-services to help support the new process and provide reinforcement throughout the implementation.

Procedure

The pre-implementation survey was administered once IRB approval was obtained and before beta testing of the revised tool. The handoffs and transitions dimensions from the AHRQ Hospital Survey on Patient Safety Culture was used and sent via email with a link to the Survey Monkey website. The survey was repeated after the intervention was integrated as standard practice on the units, which was two months after implementation. The survey link was emailed out to the nurses on the units and the responses were sent directly to the doctoral student via the Survey Monkey link. The consent and survey were also distributed on paper to the nurses and provided to the doctoral student. The paper responses were entered into Survey Monkey by the doctoral student and verified by a clinical education specialist.

Outcomes to be Measured

The data collected through Survey Monkey and the paper survey were analyzed to see if there is a positive or negative difference in the safety culture survey results after the handoff tool education and implementation on the nursing unit or no difference between the results. The four questions used are from the handoff & transitions dimension of the safety culture survey (Appendix F: Survey Questions) to measure the nurse's perceptions on handoff (first 2 questions) and safety (last 2 questions). The results were measured on a 5-point Likert scale. When the entire survey is completed, Sorra & Dyer (2010) performed a reliability analysis using Cronbach's alpha with handoffs and transition questions receiving a rating of 0.81 (acceptable reliability of 0.70 or greater).

The Quality Management Department provided the doctoral student with the number of reported adverse events to NYPORTS. This number was compared two months pre and post-implementation of the handoff tool to track patient safety events. The data collected was

examined to see if there is any change in reportable adverse events based on the change in the handoff process.

Project Timeline (Appendix G: Timeline)

- DNP Project Accepted.
    - June - July 2019
- IRB Approval GWU and practice site.
    - July 2019
- Survey completed for pre-implementation (after IRB approval).
    - August 2019
- Beta Testing Handoff tool.
    - August - September 2019
- Education and Intervention Implemented.
    - September – October 2019
- Reinforcement of Education, Leadership Support and Communicating Wins.
    - October- November 2019
- Survey completed for post-implementation, Data Analysis.
    - December 2020
- Evaluation of DNP Project Outcomes, Dissemination of project results.
    - January – March 2020
- Further Dissemination of Results, Plans for sustainability.
    - March – May 2020

Resources Needed

Resources used included access to work with staff in the development of a revised handoff tool for use between Pre-op and OR nurses, availability of computers, and staff to

support testing and implementation. Education was conducted with a tip sheet that provided additional reinforcement and a guide on how to use the tool in the EMR. IT updated the EMR and time was needed for staff to participate in the survey. The staff and leadership worked with IT to incorporate the new handoff communication tool in the EMR including signoff by the two nurses once the handoff is completed. The Perioperative Informatics Committee includes IT and perioperative leadership and the revised process was reviewed and approved. Any updates will continue to be tracked and approved by this committee. The doctoral student reviewed the updates and helped to incorporate the beta testing feedback from the staff in the final updated handoff tool.

Evaluation Plan

The evaluation plan included the collection of data before the intervention and then two months post-implementation for comparison. The nurses' perception of the safety culture survey on the dimension of handoffs & transitions was obtained once IRB approvals were completed for GWU and the practice site. The same survey was used 2 months post-implementation for comparison. The number of adverse events reported to NYPORTS was provided by quality management for two months before implementation and two months post-implementation to measure patient safety at the practice site.

Data Analysis, Maintenance & Security

All of the survey data was collected and reviewed for accuracy (Appendix H: Data). A total of 87 pre-intervention surveys (82% response rate) and 76 post-intervention surveys (72% response rate) were collected. There was only one missing data point for Question 4 on the pre-intervention survey which was completed via the survey monkey link. This missing data were not included in the data analysis.

The pre and post-survey results were reviewed for each response but due to the number of zero responses a chi-square analysis could only be performed on question 1 using all five responses. Similar results were combined (positive, neutral, negative) for all questions for data analysis. Negative (Strongly disagree/disagree and failing/poor), positive (agree/strongly agree and very good/excellent results) were combined, and neutral (neither agree nor disagree and acceptable) were used for the chi-square analysis. The combined results revealed a statistically significant improvement in the perception of safety culture for nurses in the pre-op and OR units with the new handoff communication tool in the EMR measured by the handoff & transition dimension score. There was an increase from 36% to 64% of the staff who strongly disagree or disagree that important patient care information is lost. 70% of the staff strongly disagree or disagree that shift changes are problematic. All respondents gave their unit a safety grade of acceptable or higher on the post survey. 86% of respondents agreed or strongly agreed with the statement "Our procedures and systems are good at preventing errors from happening" on the post-survey.

The analysis of the number of reported adverse events by the practice site to NYPORTS after the implementation was in place revealed an increase of one which is not an improvement. The overall number of reported adverse events is a low number which makes it difficult to note an improvement. It was also noted that the event was not related to the use of the nursing handoff communication tool.

The distribution of nurses among the two units is 15% pre-op and 85% operating room which is similar to the respondent rate of 17% pre-op and 83% operating room from the pre and post-intervention surveys. Demographic data revealed that half of the respondents for both surveys had been an RN for over 14 years. The majority of the nurses on the units are full-time

which is aligned with the 94% response rates for full-time staff for the pre and post-intervention surveys.

Implications

Practice

The practice change with the new communication handoff tool has helped to improve the process for the nurses in Pre-op and the OR. Information is readily available to the staff when handoff is occurring and the process provides an efficient way to see the relevant information. The practice change has improved the safety grade for the units and suggestions will be reviewed through the appropriate committees before implementation.

Healthcare Policy

The practice change resulted in an update to the policy on Pre-op to OR handoff to ensure that the handoff section in the EMR is used and signed off by both providers. This process brings up the section in the EMR which presents a streamlined approach for the providers to use when patient care is transferred. The use of the EMR and provider sign off puts all of the information in one place to be completed, which encourages the staff to use it and follow the process.

Executive Leadership

Executive leadership needs to be able to support staff by minimizing risk and chance of error. The information provided in the handoff tool is based on the Pre-operative guidelines for surgery and it pulls in the latest documented information for the nurses to review. The use of the EMR allows the handoff event to be documented and referenced in the patient's chart if needed.

Quality/Safety

The quality of the handoff can be observed through direct audits/observations or tracked through the EMR to verify that the nurses have signed off. Safety events should be monitored

and reviewed to see if any are related to handoff communication. A thorough review of all occurrences allows the organization to make improvements when needed.

Sustainability and Future Scholarship

To sustain the positive gains from the implementation of the handoff communication tool the organization will continue to conduct annual safety culture surveys and monitor results, especially those scores related to handoff and safety grade. Adverse events will continue to be tracked and should be analyzed on an annual basis to see if handoff communication was a factor. Follow-up action may be necessary based on the results of the surveys and adverse events.

The organization as a whole can benefit by looking at how the new handoff tool format in the EMR can be used for handoff among providers in other units and/or with different providers. The format should be the starting point for the units to use and then it could be customized for the handoff based on the provider feedback. The tool itself could be used as a template with Epic to use for other organizations when they are looking at ways to improve handoff.

Summary

A new handoff communication tool at the practice site was used to improve the safety culture of the nurses in the Pre-op and OR units while the small number of adverse events could not be used to evaluate patient safety. The IOWA Model of EBP was used to guide the project, which included the implementation and evaluation processes of the new handoff tool. The synthesis of the literature review was reviewed to support the implementation of the new handoff tool. The education plan was described with the policy updates once the intervention was implemented. The results of the survey revealed a statistically significant improvement in the perception of safety culture for nurses in the Pre-op and OR units as measured by the handoff & transition and patient safety scores. It is important to note that 100% of respondents gave their

unit a safety grade of acceptable or higher on the post-survey. No improvement in patient safety regarding adverse events was noted due to the number of adverse events equaling one, which was not related to the new handoff tool. To sustain this practice change, annual monitoring will include collecting and reviewing future safety culture survey results and continuing to track the number of adverse events quarterly.

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Appendix A

SWOT Analysis

	Helpful To achieving the objective	Harmful To achieving the objective
Internal Origin {Attributes of the organization}	Strengths • Engaged and motivated staff (Culture) • Strong leadership team – support staff, available • Reputation and commitment to quality • Magnet organization • Efficient operations	Weaknesses • Data available but not always used for improvement • Silos between departments • Volume needed for continued growth and expansion • Resources needed (staffing and time for education)
External Origin {Attributes of the organization}	Opportunities • Use of electronic medical record • Implementation of LifeWings • Quarterly updates to EMR (change could be incorporated with updates or use a stand-alone date)	Threats • Time constraints (pressure from multiple disciplines) • Resistance to change • Staff buy-in through participation • Decrease in reimbursements and competition present economic concerns

Appendix B

Evidence Table

Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study findings that help answer the EBP Question	Observable Measures	Limitations	Evidence Level & Quality
1	Canale, 2018	Quasi-experimental, Pretest/posttest design	20 CRNA's involved in transfer of care of anesthetized patients in 800 bed regional medical center in West Central Florida	Increase related to perception of patient safety through use of "Examining Transfer of Care Processes in Nurse Anesthetist Practice" survey instrument	Healthcare worker satisfaction Compliance with handoff Patient safety	Anesthetized patients CRNA's	Level II Quality B
2	Hada, Coyer, & Jack, 2018	Prospective before and after Quasi-experimental design	58 nurses All inpatients and their families @ the time of the study (61 pre and 64 post)	Statistically significant improvement after implementation of the nurses' experience with the bedside handover measured	Compliance with handover Patient outcomes Nursing staff, patient and family satisfaction	Bedside handover No statistically significant changes in patient outcomes.	Level II Quality B

			Two geriatric and rehabilitation wards of a major tertiary referral teaching and research hospital in Australia	through anonymous voluntary survey which also explored nurses' perceptions of the bedside handover Significant improvement in compliance with best-practice nursing shift-to-shift handover – measured through the bedside handover observational audit tool.			
3	Tidwell, et. al, 2011	Quasi-experimental pre and post survey	Nurses on 20 bed pediatric neuroscience unit (23 nurses pre and 17 nurses post)	Improvement in nurses' perceptions of shift report measured by 11 questions 4-point Likert	Communication Accuracy White board usage Time	Pediatric neuroscience unit Bedside reporting	Level II Quality B

				scale survey developed to measure the effectiveness and efficiency of the reporting system			
4	Usher, Cronin, & York, 2018	Quasi-experimental, Pretest/posttest design	Nurses (32 nurses pre and 25 nurses post) on a 38 bed medical surgical unit.	Improvement in nurses' perceptions of shift report measured by the MSR tool. Tools used included the Medical Intensive Care Unit Shift Report (MSR) Communication Scale and The SBR (T) competency checklist. Used unit-based change	Communication Accuracy White board usage Time	Bedside handoff	Level II Quality B

				champions to help support the project (in line with Kotter's change theory)			
5	Walsh, Messmer, Hetzler, O'Brien, & Winningham, 2018	Quasi-experimental, Pretest/posttest design	RN's (104 nurses pre and 73 nurses post) on a 250 bed South Florida hospital on two medical-surgical units	Improvement in staff satisfaction, accountability and empowerment of the nurses measured by the Specht and Ramler Accountability Index-Individual Referent and the Conditions for Workplace Effectiveness Questionnaire-II	Accountability Effectiveness Staff satisfaction Communication	Bedside shift reporting	Level II Quality B
6	Randmaa, Mårtensson, Swenne, &	Quasi-experimental design - Prospective intervention study with	Intervention group included 27 LPNs, 63 RNs and 10	Improvement in staff members' perception of communica	Incident Reports due to communication errors	Measured between different disciplines (included	Level II Quality B

	Engström (2014)	comparison group using pre assessments and post assessments	physicians and comparison group included 18 LPNs, 43 RNs, and 8 physicians in an Anesthetic clinic in two hospitals in Sweden	tion between the professionals and perception of the safety climate as measured by the ICU nurse-physician questionnaire, safety attitudes questionnaire and Spritzer's empowerment scale. Used a communication tool (SBAR) Number of incident reports decreased		physicians) Timeframe – 11 months introduction and implementation and follow-up was 6 months later	
7	Christie & Robinson (2009)	Quasi-experimental design	Nurses and physicians in a hospital in England	65% reduction in adverse events Change methodology discussed	Hospital mortality Adverse events Cardiac arrests	Physician and nurses used – results discussed sample size was not listed	Level II Quality B

					MRSA bacteremias		
8	Telem, Buch, Ellis, Coakley, & Divino (2011)	Quasi-experimental design	45 general surgery residents at an academic hospital in New York	Sentinel events used to measure results (no difference noted due to infrequency and long term evaluation is needed) Teaching curriculum of communication tool was seen to be beneficial	Sentinel events Order entry errors	Physicians	Level II Quality B
9	Johnson, Logsdon, Fournier, & Fisher (2013)	Quasi-experimental design	33 team members (20 nurses, 12 surgical technicians, and 1 anesthesia technologist) at a Medical Center in	Knowledge specific information to improve hand-off communications during perioperative transfers of patient care	Discuss leading cause of sentinel events Barriers to communication Handoff communication	Included multiple disciplines	Level III Quality C

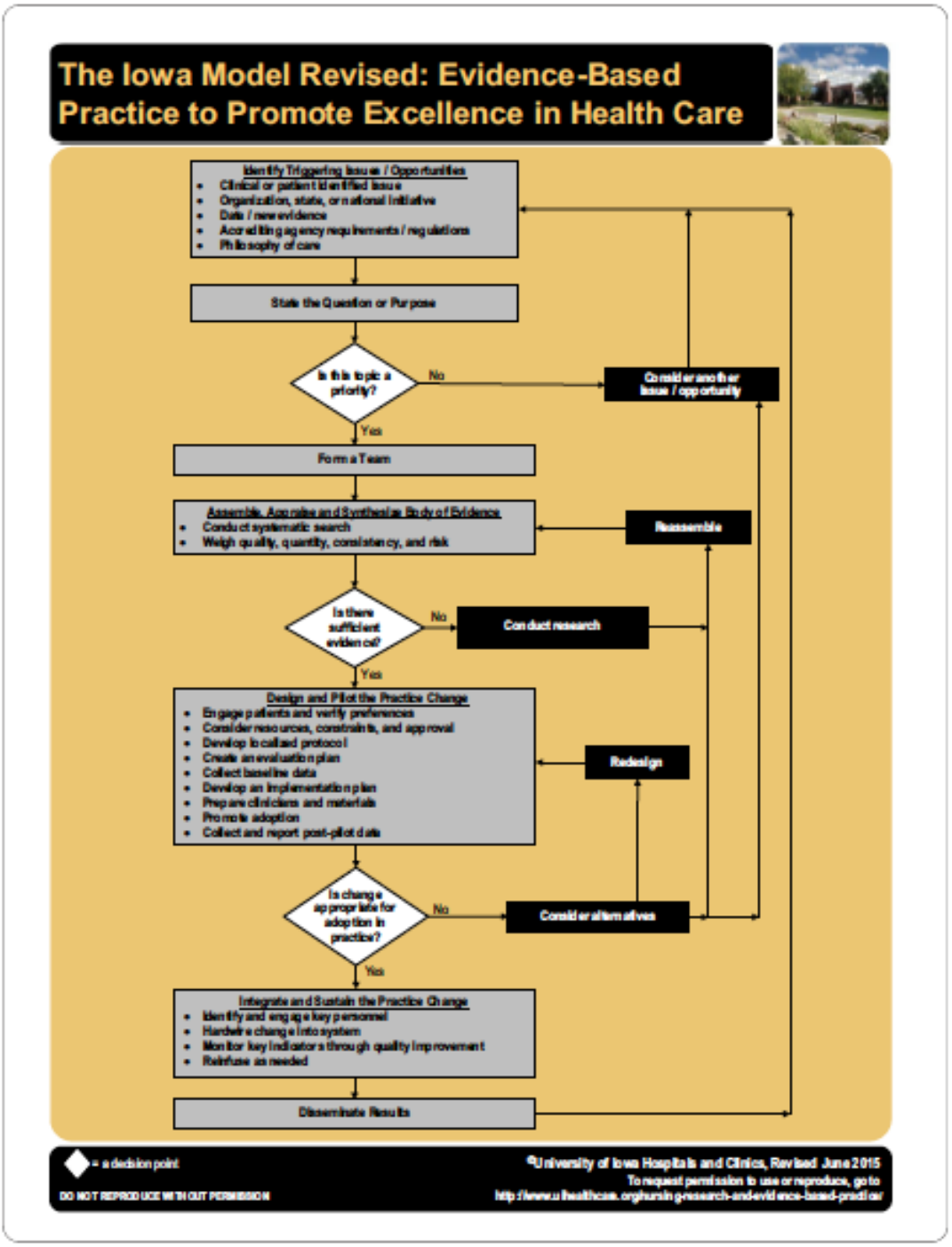
			Portland, Oregon		Standardized handoff formats SWITCH tools used for Perioperative handoffs		
10	Malley, Kenner, Kim, and Blakeney (2015)	Qualitative descriptive design with focus groups	24 nurses in a 975 bed medical center in the northeast Four focus groups (8-preanesthesia, 4-postoperative, 6-postopertive, 6-postoperative)	Pre-op – need to understand patients' level of function and vulnerabilities Importance of pre-op assessment was stressed and can impact the entire perioperative care trajectory	Understanding patient vulnerabilities Multidimensional communication Managing patients' expectations Nursing's role in compensating for gaps	Doesn't include outcome measurements Doesn't describe how transition of care should take place	Level III Quality B
11	Link (2018)	Knowledge specific information on implementation of recommendations from the AORN "Guidelines	N/A	Focus in hand over of care including pre-operative nurse to RN circulator	Identify causes of ineffective communication in the OR Standardized communicat	Focus was on the use of SBAR, but other tools were described	Level IV Quality B

		for team communication"		Promotes the use of standardized tools which should be standardized to the facility and customized to the service and patient population Team communication helps to foster a culture of safety	ion techniques AORN Comprehensive Surgical Checklist Different phases of team communication about the patient		
12	AORN (n.d.)	"Hand-off" Tool Kit to Improve Transitions in Care within the Perioperative Environment Executive Summary	N/A	Sentinel events – communication is the leading cause.	Use of TeamSTEPPS to improve team communication reviewed The Joint Commission expectations reviewed for handoff	Includes all areas of the perioperative environment Discusses handoff with multiple providers	Level IV Quality B

Appendix C

IOWA Model of EBP

Iowa Model-Revised



Appendix D

Consent

Informed Consent for Participation in a Research Study

Title of Study: Nurse's Perception of Safety Culture and Patient Safety with the Handoff Communication Process between Pre-op and Operating Room Nurses Post Intervention
IRB #:
Principal Investigator Name: Dr. Karen Kesten
Version Date: 07/16/2019

You are invited to participate in a research study under the direction of Dr. Karen Kesten of the Department of Nursing, George Washington University (GWU). Taking part in this research is entirely voluntary. Further information regarding this study may be obtained by contacting Tracy Willett at telephone number (646)797-8341.

The purpose of the study is to improve pre-op and operating room nurses' perception of safety culture and patient safety with the handoff process with an intervention of a revised handoff communication tool in the electronic medical record (EMR) when compared with the customary handoff process when evaluated three months post implementation.

What are the reasons you might choose to volunteer for this study?
To improve patient safety.
To improve the handoff communication between the Pre-op and OR nurses.

What are the reasons you might not choose to volunteer for this study?
Uncomfortable with the topic.
It will not impact your employment status or performance evaluation if you don't want to participate or choose not to complete the study.

If you choose to take part in this study, you will answer the survey questions in relation to handoff between the pre-op and OR nurse. The total amount of time you will spend in connection with this study is 10 minutes. You may refuse to answer any of the questions, and you may stop your participation in this study at any time.

Possible risks or discomforts you could experience during this study include:
If you are uncomfortable with the question or topic you can skip the question or stop your participation in the study at any time.

You will not benefit directly from your participation in the study. The benefits to science and humankind that might result from this study are:
Improved safety culture
Improved patient safety

Improved communication

Every effort will be made to keep your information confidential, however, this cannot be guaranteed. The survey is anonymous and no identifying information will be connected to your result. If results of this research study are reported in journals or at scientific meetings, the people who participated in this study will not be named or identified.

If you have any questions about your rights as a participant in this study or any questions about your participation that you would like to ask an institutional representative who is not part of this study, you can call the Institutional Review Board.

Your willingness to participate in this research study is implied if you proceed.
*Please print a copy of this document in case you want to read it again.

Appendix E

Lesson Plan

Lesson Plan	
Lesson Topic	Handoff Communication and use of new handoff tool between Pre-op and OR nurse
Lesson Length	30 minutes
Lesson Objectives	
• Registered Nurse will identify method of handoff communication. Competency: Application of new requirements to reinforce knowledge. • Registered Nurse will review areas of weakness during a handoff. Competency: Evaluation of potential areas for errors helps the Registered Nurse form opinions. • Registered Nurse will review use of the new handoff tool in the EMR. Competency: Comprehension of handoff with the tool will be shown with a demonstration. • Registered Nurse will learn benefits of new handoff report. Competency: Analysis of handoff tool will assist the learner to review the breakdown for each section of the handoff.	
Instructional Strategies and Activities	
Lecture and PowerPoint presentation • Lecture with an PPT Rationale: Provide information in objectives using auditory and visual stimulation. • Review of Pre-op to OR handoff in EMR. Rationale: Group will have an opportunity to see the handoff in the EMR and ask questions.	
Assessment Plan	
Opportunity to ask questions provided during lecture and demonstration. Change in knowledge related to handoff communication. The registered nurse will be able to complete the new handoff process. Tip sheets will be provided to assist the nurse with the use of the new tool.	

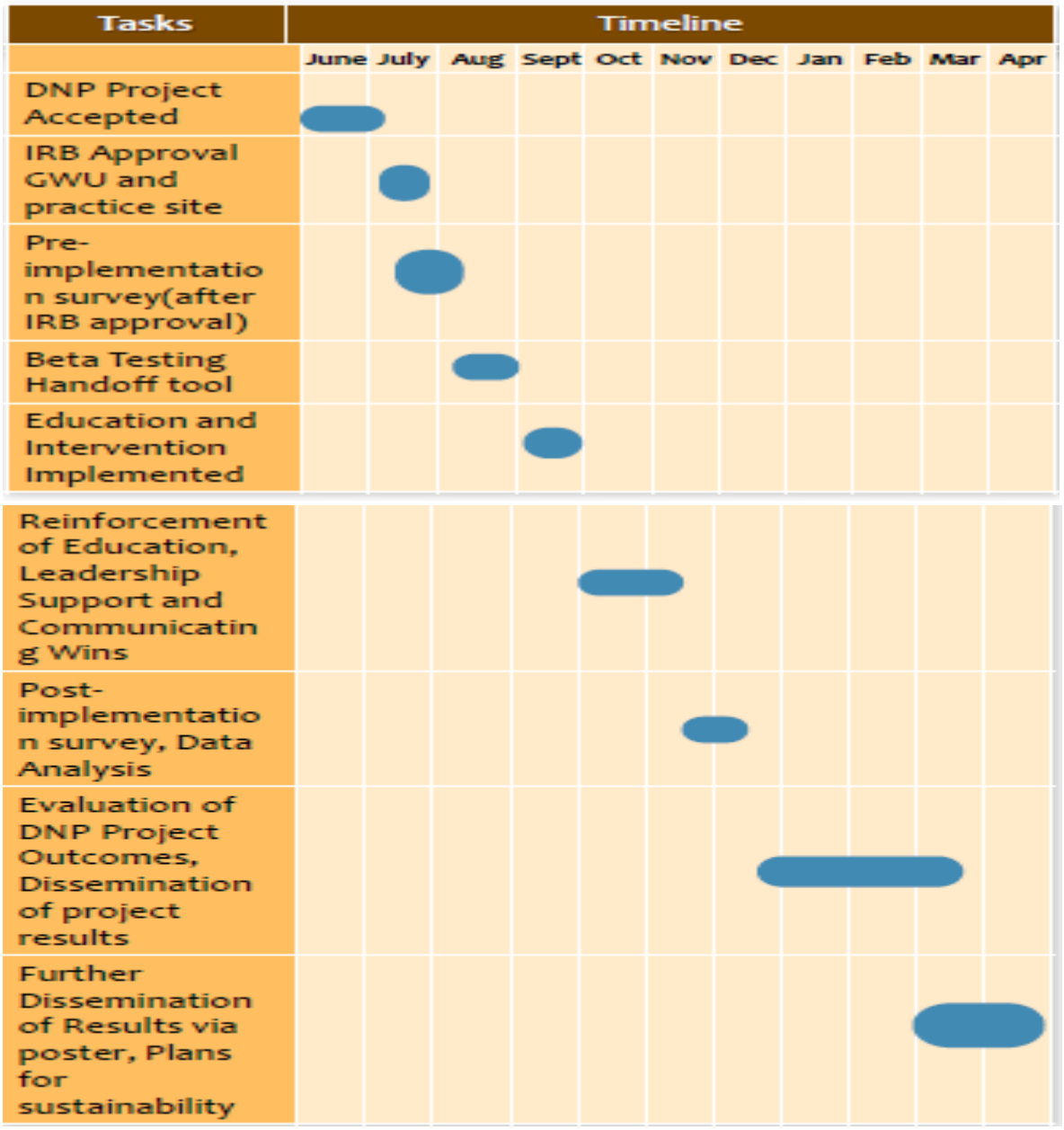
Appendix F

Survey Questions

Important patient care information is often lost during shift changes. (negatively worded)	1, Strongly disagree; 2, Disagree; 3, Neither Agree nor Disagree; 4, Agree; 5, Strongly agree
Shift changes are problematic for patients in this hospital. (negatively worded)	1, Strongly disagree; 2, Disagree; 3, Neither Agree nor Disagree; 4, Agree; 5, Strongly agree
Please give your work area/unit in this hospital an overall grade on patient safety.	1, Failing; 2, Poor; 3, Acceptable; 4, Very Good; 5, Excellent
Our procedures and systems are good at preventing errors from happening	1, Strongly disagree; 2, Disagree; 3, Neither Agree nor Disagree; 4, Agree; 5, Strongly agree

Appendix G

Timeline



Appendix H

Data

Survey Questions	Pre-Handoff Intervention (=0)	Post-Handoff Intervention (=1)	Statistical Analysis
Q1: Important patient care information is often lost during shift changes. (Negatively worded) (F5)	n = 87	n = 76	P value from Chi-square test (X^2)
Strongly disagree	4 (4.60%)	8 (10.53%)	0.000 (5 out of 5)
Disagree	27 (31.03%)	41 (53.95%)	
Neither Agree nor Disagree	20 (22.99%)	13 (17.11%)	
Agree	25 (28.74%)	12 (15.79%)	
Strongly agree	11 (12.64%)	2 (2.63%)	
Positive (Disagree/Strongly Disagree)	31 (35.63%)	49 (64.48%)	Combined percentages 0.000
Neutral (Neither Agree nor Disagree)	20 (22.99%)	13 (17.11%)	
Negative (Agree/Strongly Agree)	36 (41.38%)	14 (18.42%)	
Q2: Shift changes are problematic for patients in this hospital. (Negatively worded) (F11)	n = 87	n = 76	P value from Chi-square test (X^2)
Strongly disagree	7 (8.05%)	8 (10.53%)	0.000 (4 out of 5)
Disagree	30 (34.48%)	45 (59.21%)	

Neither Agree nor Disagree	26 (29.89%)	17 (22.37%)	
Agree	18 (20.69%)	6 (7.89%)	
Strongly agree	6 (6.90%)	0 (0.00%)	
Positive (Disagree/Strongly Disagree)	37 (42.53%)	53 (69.74%)	Combined percentages 0.000
Neutral (Neither Agree nor Disagree)	26 (29.89%)	17 (22.37%)	
Negative (Agree/Strongly Agree)	24(27.59%)	6 (7.89%)	
Q3: Please give your work area/unit in this hospital an overall grade on patient safety (E1)	n = 87	n = 76	P value from Chi-square test (X^2)
Failing	0 (0.00%)	0 (0.00%)	0.002 (3 out of 5)
Poor	5 (5.75%)	0 (0.00%)	
Acceptable	27 (31.03%)	15 (19.74%)	
Very good	43 (49.43%)	40 (52.63%)	
Excellent	12 (13.79%)	21 (27.63%)	
Negative (Failing/Poor)	5 (5.75%)	0 (0.00%)	Combined percentages 0.021 (2 out of 3)
Neutral (Acceptable)	27 (31.03%)	15 (19.74%)	
Positive (Very Good/Excellent)	55 (63.22%)	61 (80.26%)	

Q4: Our procedures and systems are good at preventing errors from happening. (A18)	n = 86	n = 76	P value from Chi-square test (X^2)
Strongly disagree	0 (0.00%)	0 (0.00%)	0.004 (4 out of 5)
Disagree	5 (5.81%)	2 (2.63%)	
Neither Agree nor Disagree	23 (26.74%)	9 (11.84%)	
Agree	45 (52.33%)	46 (60.53%)	
Strongly agree	13 (15.12%)	19 (25.00%)	
Negative (Disagree/Strongly Disagree)	5 (5.81%)	2 (2.63%)	Combined percentages 0.003
Neutral (Neither Agree nor Disagree)	23 (26.74%)	9 (11.84%)	
Positive (Agree/Strongly Agree)	58 (67.45%)	65 (85.53%)	
Adverse Events			
	Pre-Implementation (2 months prior)	Post-Implementation (2 months post)	Paired t-test
Reported NYPORTS events at site	0	1	The correlation and t cannot be computed because the sum of case weights is less than or equal to 1.

	Value (Pre-intervention)	**Value (Post-intervention)**
Unit currently working on	n = 87	n = 76
Pre-op Unit	15 (17.24%)	13 (17.11%)
Operating Room Unit	72 (82.76%)	63 (82.89%)
	Value (Pre-intervention)	**Value (Post-intervention)**
# of years as an RN	n = 87	n = 76
<2 yrs	12 (13.79%)	10 (13.16%)
2-5 yrs	7 (8.05%)	11 (14.47%)
6-9 yrs	12 (13.79%)	8 (10.53%)
10-13 yrs	11 (12.64%)	8 (10.53%)
14+ yrs	45 (51.72%)	39 (51.32%)
	Value (Pre-intervention)	**Value (Post-intervention)**
Full-time or Part-time status	n = 87	n = 76
Full-Time	82 (94.25%)	72 (94.74%)
Part-Time	5 (5.75%)	4 (5.26%)