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Operating Room Nurse to Post Anesthesia Care Unit Nurse Handoff: Implementation of a Written SBAR Intervention

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VALPO

Operating Room Nurse to Post Anesthesia Care Unit Nurse Handoff:

Implementation of a Written SBAR Intervention

by

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DEDICATION

I would like to dedicate this project to my family and thank them for their patience with me throughout the many stresses and successes of this DNP program. Thank you for your endless love, support, and encouragement.

And also to my classmates, with whom I have been blessed to share this journey and for whom I have great respect.

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ABSTRACT

The lack of standardized handoff from the operating room (OR) nurse to the post anesthesia care unit (PACU) nurse may result in the miscommunication or omission of patient information, which increases the risk of patient safety events. The goal of this EBP project was to standardize OR to PACU nurse handoff in order to reduce risks to patient safety. A literature review revealed guidelines for handoff which included implementing a standardized protocol and using a mnemonic phrase. The Iowa Model of Evidence-Based Practice and Lewin's Model of Change guided the EBP project. Handoff quality was evaluated by OR and PACU nurses using a Handoff Evaluation form for two weeks. After two weeks, education was conducted on the importance of standardized handoff and OR nurses began using the standardized SBAR Handoff form while PACU nurses continued with the Handoff Evaluation form until project completion. At intervals of two and six weeks, perioperative nurses completed the Safety Attitudes Questionnaire (SAQ) as a pretest and posttest for perceptions of safety. Cronbach's alpha, independent *t* and paired *t* tests were completed on the SAQ. SBAR Handoff and Handoff Evaluation forms were paired based on patient information. Handoff Evaluation and SBAR Handoff forms were analyzed with frequencies, mean score, and independent *t* tests. Handoff Evaluation forms were also analyzed with a paired *t* test and analysis of variance for the three data collection points. Patient safety was measured via an audit of MIDAS risk reports prior to and at the end of data collection. OR and PACU SAQ scores revealed one significant item between the pretest and posttest, which was the Support item ($t(11) = 2.60$, $p = 0.025$). Means of the handoff items on the PACU Handoff Evaluation form increased from phase one ($M = 8.14$, $SD =$

3.2) to phase two (*M* = 8.31, *SD* = 3.4) and then ultimately decreased to phase three (*M* = 7.57, *SD* = 3.25). Means of the handoff items on the OR SBAR Handoff form decreased from phase two (*M* = 12.38, *SD* = 3.69) to phase three (*M* = 11.5, *SD* = 3.48). This was supported by independent *t* and paired *t* testing. The Handoff Evaluation from ANOVA did not support any significant change in handoff items among the three phases and frequencies showed no significant changes in reported items ($F(66,68) = 0.207$, $p = 0.814$). MIDAS risk reports did not change and no reports were filed during the time of the audit. The literature recommends perioperative nurses should use a mnemonic phrase and implement a standardized protocol to aid nurse memory during handoff; however, these recommendations were not beneficial in standardizing perioperative nurse handoff in this EBP project.

CHAPTER 1

INTRODUCTION

In clinical practice nurses have many responsibilities and one of the most vital skills a nurse possesses is the ability to transfer patient information, or handoff, to another healthcare provider. This exchange of information or handoff occurs many times a day and passes on the information that the receiving nurses use while caring for their patients. The Joint Commission has defined handoff as “the transfer of responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis” (Ong & Coiera, 2011, p. 274).

The handoff occurs at the change of shifts, which happens at least three times daily for each patient (Riesenberg, Leitzsch & Cunningham, 2010), and whenever the patient changes clinical settings such as in the perioperative setting when patients are transferred to a new perioperative area (Kalkman, 2010). There are a number of barriers to handoff communication and nurses rely heavily on each other when receiving handoff, as this is a time where miscommunication can occur (Abraham, Kannampallil & Patel, 2014; Kalkman, 2010; Petrovic, Aboumatar & Scholl et al., 2014; Riesenberg, Leitzsch & Cunningham, 2010; Riesenberg, Leitzsch & Little, 2009; The Joint Commission, 2015). Fortunately for nurses who complete a handoff, the literature has reported that the utilization of standardized communication processes decreases the number of errors made during handoff (Abraham, Kannampallil & Patel, 2014; Kalkman, 2010; Riesenberg, Leitzsch & Cunningham, 2010; Riesenberg, Leitzsch & Little, 2009; Petrovic, Aboumatar & Scholl et al., 2014; The Joint Commission, 2015).

It has long been acknowledged that handoff is a vulnerable time for patients and that communication errors and patient events occur as a result of miscommunication or inaccurate information transfer (Abraham, Kannampallil, & Patel, 2014; Holly & Poletick, 2013; Manser, Foster, Flin, & Patey, 2012; Nagpal et al., 2012; Riesenberg, Lietzsch, & Cunningham, 2010). One problem facing nurses is that handoff from only memory is not reliable (Holly & Poletick, 2013; Kalkman, 2010; Riesenberg, Leitzsch & Little, 2009) and there is often a lack of structure to the handoff process (Abraham, Kannampallil & Patel, 2014; Kalkman, 2010; Petrovic, Aboumatar & Scholl et al., 2014; Riesenberg, Leitzsch & Cunningham, 2010; Riesenberg, Leitzsch & Little, 2009; The Joint Commission, 2015). The unique setting of the perioperative area is subject to particular barriers to communication including noise, interruptions, and a high rate of patient arrival and discharge. The operating room (OR) nurse must handoff in a timely manner in order to maintain a busy operative schedule while the Post Anesthesia Care Unit (PACU) nurse must care for several patient in need of various levels of care. A lack of structure to the handoff between these nurses places surgical patient safety at risk as miscommunication is more common when handoff protocol is not standardized (Abraham, Kannampallil & Patel, 2014; Kalkman, 2010; Petrovic, Aboumatar & Scholl et al., 2014; Petrovic, Martinez & Aboumatar, 2012; Riesenberg, Leitzsch & Cunningham, 2010; Riesenberg, Leitzsch & Little, 2009; The Joint Commission, 2015).

The purpose for this evidence based practice project was to reduce communication errors and reduce patient risks during the handoff communication between OR and PACU nurses by standardizing communication with the tested mnemonic tool SBAR.

Background

There was a national movement towards standardization of nurse handoffs in 2006 when the Joint Commission introduced handoff recommendations in order to reduce the risks associated with the transfer of patient information (Kalkman, 2010; Riesenberg, Leitzsch, & Cunningham, 2010). Since these guidelines were published, a wealth of data regarding nurse handoffs has appeared in the literature and for the most part studies showed that standardization processes have successfully reduced safety risks to patients (Kalkman, 2010; The Joint Commission, 2015).

Most often the implementing of the 2006 Joint Commission recommendations, known as the National Patient Safety Goal 2E, was accomplished by means of the adoption of a mnemonic phrase. While the Joint Commission recommended SBAR (Situation, Background, Assessment, Recommendation), it also stated that other alternative mnemonics might be used as long as handoff was standardized among nurses (Holly & Poletick, 2013; Kalkman, 2010). Since 2006 the use of a mnemonic phrase practice had become widely accepted and it was thought that mnemonics were originally added to the handoff recommendations because they enhanced memory by walking the nurse through a checklist of required handoff information for each patient (Riesenberg, Leitzsch & Little, 2009). These recommendations were further enforced in 2010 when the World Health Organization (WHO) began recommending the use of checklists for surgical patients in order to promote patient safety in all the perioperative areas (Kalkman, 2010; Riesenberg, Leitzsch, & Cunningham, 2010).

While these guidelines were widely used and evidence based, there remain no explicit recommendations for perioperative nurses to follow during handoff while

transferring patients. In order to standardize handoff among perioperative nurses, they must turn to the Joint Commission's recommendations when it is time to transfer surgical patients to a new perioperative nurse for care (WHO, 2015).

Aside from the obvious benefits to patients, using structured handoffs had a positive influence on nurses as well. According to a systematic review done by Ong and Coiera (2011), the teamwork between nurses who used a standardized handoff protocol was reportedly improved. Another systematic review that evaluated handoff tools found that nurses' perceptions of care quality, efficiency, information omissions, and patient safety were measured frequently in various individual studies (Abraham, Kannampallil, & Patel, 2012). In one study, every category of the handoff from nurses, physicians, and anesthesia staff improved the receiving nurses' handoff satisfaction scores after the standardizing intervention (Petrovic, Aboumatar, & Scholl, 2015).

Statement of the Problem

The problem addressed in this project was one that faced all perioperative nurses and presented as the lack of a standardized handoff protocol during the transfer of surgical patients from one perioperative area to another. This project specifically examined the handoff between OR nurses and PACU nurses. The impact of a mnemonic phrase which was used to standardize the content of handoffs in order to reduce the risks to patient safety and promote positive perceptions of patient safety and teamwork were assessed among perioperative nurses.

Data from the Literature

Studies showed that the lack of standardization during nurse handoff might lead to multiple errors including the loss of patient information or miscommunication

(Abraham, Kannampallil & Patel, 2014; Ong & Coiera, 2014). Other studies showed that variability in handoff procedure among nurses may introduce errors to patient care (Ong & Coiera, 2014; Riesenberg, Leitzsch & Cunningham, 2010), while others reported that relying on memory alone during handoff is dangerous for patients (Kalkman, 2010; Riesenberg, Leitzsch & Little, 2009).

Since the 2006 Joint Commission National Patient Safety Goal 2E recommendations, researchers have nearly unanimously agreed that communication problems are known to be linked to sentinel events (Riesenberg, Leitzsch & Little, 2009). In fact the Joint Commission had completed studies showing that 50%-70% of sentinel events could be linked to communication errors that were made during a patient handoff (Greenberg et al., 2007; Holly & Poletick, 2013; Riesenberg, Leitzsch, & Little, 2012). Researchers summed up the themes found in the evidence well by stating, “Communication failures among healthcare providers have been identified as a leading cause of these incidents. Miscommunication happens when a patient is transitioned from one team of providers to the next or different care areas” (Petrovic, Aboumatar, & Scholl et al., 2014, p.112).

The perioperative setting is unique and posed several barriers to communication that might not be present in other nursing environments. This setting is fast paced as patients arrived and left frequently, and there was a wide variety in level of care provided. At times there was a high level of noise interference, handoff was multidisciplinary and providers were at different levels of training (Holly & Poletick, 2013). Handoff was also interdisciplinary and the transfer of technology including monitors and lines was considered a distraction during nurse handoff (Petrovic,

Martinez & Aboumatar, 2012). The inclusion of irrelevant data was a barrier to safe handoffs and while this was not limited to the perioperative areas, it certainly warranted consideration as patient status changed quickly in this setting (Petrovic, Martinez & Aboumatar, 2012).

These barriers were compounded by the barriers related to all nurse handoffs, which were summarized as the “lack of standardized handoff tools; information omissions and inaccuracies; communication breakdowns related to language, social, and skill issues; lack of training; and contextual constraints” (Abraham, Kannampallil & Patel, 2014, p. 154).

While it was clear that a solution to this clinical problem was available, there was no mnemonic phrase that was considered best according evidence based practice for the standardization of handoff. In addition, there was insufficient data to support a specific tool to standardize handoff; however, there was plenty of literature supporting the process of standardizing handoff using an accepted mnemonic tool (Abraham, Kannampallil, & Patel, 2012; Ong & Coiera, 2011). Additionally, there was even less literature that investigated handoff in the perioperative area which had many unique areas of patient care (Ong & Coiera, 2011; Petrovic, Aboumatar & Scholl et al., 2014; Petrovic, Martinez & Aboumatar, 2012), although SBAR was used more frequently than other mnemonic phrases in the perioperative area (Riesenberg, Leitzsch & Little, 2009).

Data from the Clinical Agency

In the perioperative area, the project leader had observed a lack of standardized communication during handoff. This lack of standardization was a shared concern in management. Before beginning this project, the project leader entered into

communication with the OR manager and discussed the possibility for a practice change in perioperative nursing handoff. The manager was receptive and open to making an evidence-based practice change.

Purpose of the EBP project

The purpose for this evidence-based practice project was to reduce communication errors and minimize patient risks during the handoff communication between OR and PACU nurses by standardizing communication with the tested mnemonic tool SBAR. In order to combat the multiple barriers described above and observed by the author of this project, the mnemonic phrase SBAR was chosen based on the Joint Commission's recommendations for the standardization process and its support by the Association of periOperative Registered Nurses (AORN) (AORN, 2012; The Joint Commission, 2015). The compelling clinical question which propelled this project forward was: Will the use of SBAR during post procedure handoff serve to standardize handoff among perioperative nurses and reduce patient risks?

The PICOT question for this project restated the research question in order to accurately reflect the goals of this project: In perioperative nurses, how will the implementation of a written SBAR Handoff Form affect the content of Handoffs between OR and post anesthesia care unit nurses and impact the perceptions of teamwork and patient safety of perioperative nurses over the course of three months when compared to current oral report practice?

Significance of the Project

The significance of this evidence based practice project was measured in several ways. First, the author hoped to fulfill the Joint Commission's requirements for the safe

transfer of patient information during nurse handoff in the perioperative setting between OR nurses and PACU nurses. Standardization of handoff would reduce communication errors that contribute to sentinel events or near sentinel events. Compliance to these recommendations was a national goal that had not been met prior to the implementation of this evidence based practice project.

Second, the perioperative nurses' perceptions of handoff would reflect the improvement in handoff content by improving in the categories of teamwork and patient safety. Structured communication would promote the interaction between OR nurses and PACU nurses so that patient care transfers are a team effort. Opportunities for asking questions and the use of a mnemonic phrase would promote a complete transfer of patient information so that the PACU nurse had everything needed to provide appropriate care to newly transferred surgical patients.

Thirdly, patient safety would improve or at least be maintained at its current level as evidenced by reported patient events or near events in the hospital's report system. At the time of this project, perioperative nurses were encouraged to use an online patient event reporting system to document sentinel events or near sentinel events. It was hoped that once the SBAR handoff was being used regularly and correctly, the number of reports filed indicating patient events will either stay the same or decrease.

These three goals were all based on the perioperative nurse's ability to participate in thorough and safe handoff practices. The transfer of patient information is one of the patient's most vulnerable experiences and there is a high risk for communication errors (Abraham, Kannampallil & Patel, 2014; Holly & Poletick, 2013; Kalkman, 2010; Ong & Coiera, 2014; Riesenberg, Leitzsch & Cunningham, 2010;

Riesenberg, Leitzsch & Little, 2009; The Joint Commission, 2015). It was imperative that perioperative nurses use best practice to ensure the best care for surgical patients and preserve patient safety. By using SBAR to standardize handoff, the many risks to patient safety would be reduced and nurse perceptions of teamwork and communication will be positively influenced.

It was hoped that the significance of this evidence based practice project would be apparent to the perioperative nurses who participate in the handoff process. The primary goal was to keep the patient at the center of nursing care and improve practice based on the evidence reported in recent literature. While some nurses might have been aware of the useful nature of a mnemonic phrase for handoff, many did not take full advantage of this simple intervention to promote patient safety. The ultimate goal was to attain significant results from the data and implement this intervention into hospital policy.

CHAPTER 2

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

The goal of this project was to be guided by evidence based on the results of a literature search and subsequent review of the literature. It was also appropriate to discuss the frameworks which guided the implementation of the proposed intervention and methods of this evidence-based practice (EBP) project. Lewin's Model of Change was used to address the long term sustainability of the project and the process of introducing and modifying current perioperative nurse behavior. The Iowa Model of Evidence-Based Practice was used to guide implementation (Burns, 2004; Titler, 2001).

Theoretical Framework

The theoretical framework for this EBP project was Lewin's Model of Change, which was a three step model for organizational change (Burns, 2004). Kurt Lewin was a social scientist and is best remembered for developing this model in 1947. Lewin was quite an interesting man and was born a German Jew in 1890 before he moved to America in 1933 in order to escape the Nazi regime (Burns, 2004).

Lewin did much work in field theory and was the first to write about 'group dynamics' in regards to a group shaping the behaviors of its members. This led Lewin to the concept of 'action research' which began the thought that change required action and the success of change was based on correctly assessing the situation of the group. All this work led Lewin to design the three step Model of Change: *unfreezing*, *moving*, and *refreezing* (Burns, 2004).

The first step of Lewin's model, *unfreezing*, refers to the need to destabilize equilibrium in order to change old behavior (Burns, 2004). This way a behavior can be

unlearnt in order to adopt a new behavior and create motivation for learning a new behavior. Lewin used the concept of ‘equilibrium’ to refer to group’s human behavior (Burns, 2004). The concept of equilibrium encompasses the dynamic decision making process within the group. Equilibrium is essential to how the group behaves and Lewin stated that equilibrium must be broken down in order to effectively change the group’s behavior over time (Burns, 2004).

The second step, *moving*, implies that the group is changing by learning a new behavior, and all the forces acting on the group are taken into account (Burns, 2004). Lewin stated that predicting a planned change is very difficult as forces acting on the group are often complex. Lewin also recommended that one should evaluate the forces working in the situation in order to explore all change options (Burns, 2004).

The third step, *refreezing*, concerns stabilization of the equilibrium and protects the new behavior from regression (Burns, 2004). This new behavior should be in alignment with the environment, personality of the learner, and the group’s behavior in order to be a successful, lasting behavioral change (Burns, 2004).

In the proposed project there were several forces that were considered when implementing the proposed change to nursing practice. The implementation of a communication change is effected by factors such as politics, time, efficiency of the intervention, and willingness of the group to change. The politics within the organization must be ready to accept change and be willing to make a long term change in behavior. Nurses must be willing to take the time to learn about the change and alter their equilibrium and this process should not take up too much time as to discourage nurses from participating in the project. The written Situation Background Assessment

Recommendation (SBAR) handoff intervention should be efficient and accomplish what it is intended to do, which is standardize handoff communication and promote patient safety. The implementation of the intervention should be practical so nurses are willing to alter their equilibrium. Finally, the group of perioperative nurses must also be willing to change at the beginning of the project so that the education is internalized and change in handoff can begin in the PACU setting.

Lewin's model is a sufficient model for change and was well suited to the goals of the proposed project. The three steps are simple and easy to follow, but allow for implementation in a variety of settings and interventions. In this project, the plan was to educate the nurses about standardization of handoff and implement a written SBAR handoff form to encourage uniform handoff between OR and PACU nurses. The design was nearly identical to Lewin's model (Burns, 2004) and his explanation for why these steps work is reflected in the results of other studies implementing change (Athanasakis, 2013; Malekzadeh, Mazluom, Toktam, & Tasseri, 2013).

Application to EBP Project

Lewin's Model of Change was highly appropriate for this EBP project as its goal was to facilitate lasting change in a group. Lewin's change model was used successfully to improve the handoff between nurses (Malekzadeh et al., 2013).The three steps of the model were directly applied as methodology in this study and showed positive results with the SBAR intervention. A second study made a more in depth application of Lewin's theory and applied it directly to the project methods (Malekzadeh et al., 2013). The researchers in this study followed Lewin's model explicitly by first educating nurses,

implementing a standardized handoff tool, and evaluating the effectiveness of the change.

A second support for the use of this framework was a systematic review consisting of 19 articles in which four made use of Lewin's theory (Athanasakis, 2013). The authors of this review state based on the four studies Lewin's three step model was useful in implementing a change in handoff communication and observing the effects of the change.

The goals of this proposed EBP project were similar to the two studies that successfully followed Lewin's model while implementing a standardized handoff protocol. The structure of Lewin's three step model was ideal in its simplicity and direct application to the process of change for standardizing perioperative nurse handoff. The data collection for this EBP project will occur in three phases that mirror the phases of Lewin's model. First, handoff was measured before the SBAR intervention (*unfreezing*). During this part of the project the staff in the OR and PACU were educated on the importance of handoff standardization and be introduced to the SBAR format. The OR nurses used the SBAR handoff form to complete a handoff to PACU nurses. The PACU nurses evaluated the handoff they receive from the OR nurses at every transition of patient care from the OR to the PACU. Second, the new practice would be evaluated after education (*moving*). The OR nurses were assessed for their compliance to the SBAR handoff format and the PACU nurses' evaluations of handoff were monitored. Finally, handoff forms were evaluated after the education phase when perioperative nurses had to complete a handoff without the educator reinforcing the new behaviors (*refreezing*). In this phase of the project the OR and PACU nurses continued in their

new handoff behavior without the guidance of the project leader. The methods of the EBP project are discussed in further detail in Chapter 3.

It is hoped that the forces in the OR and PACU positively impacted the intervention of a standardized handoff tool between OR and PACU nurses. The equilibriums in both of these departments were similar and the success in one department was dependent on success in the other. The support of this project by management was a positive political force, but recent implementation of other changes, such as Time Out criteria and specialty teams in the OR and staffing in the PACU, may have made additional change difficult.

Strengths and Limitations

Strengths of this model included the planned steps for change, acknowledgement of forces acting on the group, the simplistic nature of the model, and its application to problems within a system (Athanasakis, 2013; Burns, 2004; Malekzadeh et al., 2013). The use of this model allowed for directional change as well as management and control (Burns, 2004). It also acknowledged that there was resistance to change and that this can be overcome by good leadership (Burns, 2004). Another strength of the model was that the three steps are concrete enough to follow and abstract enough for broad application (Athanasakis, 2013; Burns, 2004; Malekzadeh et al., 2013).

Several criticisms of Lewin's Model of Change were that the approach was quite simplistic; the model was only relevant to isolated change; it ignored the power and politics within organizations; and it advocated a top-down approach to change (Burns, 2004). Unfortunately, weaknesses of this model were not discussed within the reported

studies or reflected in the limitations of the methods of the studies (Athanasakis, 2013; Malekzadeh et al., 2013).

Limitations of this model within the EBP project were that it was open for broad application and while allowing for influential forces, it did not identify any forces specifically. It was also concerning that the model was linear, while in reality the application of the model was more complex (Burns, 2004). The simplicity of the steps might have been considered assumptive in their simple nature and process of change (Burns, 2004). The model also did not attempt to explain factors that promote change, which would be helpful to researchers (Burns, 2004). Specifically in this project both the OR and PACU departments had been subject to recent change and nurses may have been resistant in altering their equilibrium so soon. If the proposed change was accepted, this same concern may negatively affect the long-term implementation of the change.

EBP Model of Implementation

The Iowa Model of Evidence-Based Practice was used for the proposed EBP project and was chosen because of its attempt to integrate research evidence with clinical practice in six structured steps. The first step was to identify a practice question and focuses on “triggers”, or problems that require a nurse’s critical thinking (Titler et al., 2001). The second step was to determine if the topic was a priority while the third step formulated a team to do an evidence search, critique, and synthesis (Titler et al., 2001). The fourth step appraised the evidence, step five was a piloted change, and step six was the evaluation of the change (Titler et al., 2001). This model was first introduced in 1994 and was later revised into the steps described in 2001 (Titler et al., 2001). This

model was considered good for any EBP project because of its focus on evidence and subsequent emphasis on best practice (Titler et al., 2001).

One study investigated the use of a standardized tool in the nurse shift report process made use of the Iowa Model because of its comprehensive steps (Chung et al., 2011). The detailed process of this model was followed implicitly by the researchers of this study, who used it as the structure for their methods and intervention.

Application to EBP Project

The Iowa Model of Evidence-Based Practice is ideal for a researcher attempting to answer a clinical research question. The project leader chose this model for its explicit steps as it provided a process for the EBP project to follow while allowing for a broad application to topics. The model's attention to the evidence was also appreciated, as this helped build a reputable foundation of knowledge for the project leader to found a need for change. The Iowa Model is appropriate for change within a system and that was necessary for the application of this model to this EBP topic (Chung et al., 2011; Titler, 2001).

This model was followed as the project leader formulated a PICOT question and approached management to validate concerns. The second and third steps were followed as the project leader conducted research to find a particular set of evidence and critiqued it. The fourth step was followed as the evidence was appraised in order to support a need for change finally the fifth step was the formulation of a pilot change in the department, which was submitted for review at both Valparaiso University's IRB and the organization's IRB. These steps followed the Iowa model directly and provided a reputable structure for the project's implementation.

Strengths and Limitations

Strengths of the Iowa Model were that it was easily applicable in many areas of practice and its structured steps provided guidance to researchers (Titler et al., 2001). It was also problem and evidence focused, so that researchers must support their clinical question with evidence before piloting a change (Titler et al., 2001). The model was easy and simple to follow, due to its specific steps, and it was easily applicable within a system (Titler et al., 2001). One limitation of the Iowa Model was that beyond the research of evidence it did not provide structure concerning data collection or interpretation. Another concern was that it may be too concentrated on finding and appraising evidence, as this would limit its use in making new discoveries (Chung et al., 2011; Titler, 2001).

While these were certainly valid concerns, the proposed project was not aimed at generating new evidence but at implementing a well-documented intervention in an underreported setting. While the model did not lend itself to recommending certain methods for data collection, the majority of the literature reported qualitative data and the lack of structure here made the Iowa model ideal. These two aspects of the proposed project minimized the concerns associated with the use of the Iowa model.

Literature Search

In order to support the research question a thorough literature search was conducted using multiple databases including CINAHL, ProQuest, Medline (PubMed), Medline (EbscoHOST), Cochrane Library and Joanna Briggs Institute. The evidence was further limited by the search criteria of published within the last ten years, peer reviewed, scholarly or academic journal, research article, and English language.

Multiple keywords were tested during the literature search and the final set of terms included periop*, intraop*, handoff*, and handover*. A list of the numbers of articles found in each database along with search terms is located in Table 2.1.

Once the initial searches were finished, 148 articles were eligible for inclusion based on titles and abstract review. Once these articles were selected, the project leader reviewed each article and articles were chosen for literature review based on inclusion criteria. Sources of evidence included articles that observed OR to recovery room or intensive care unit post procedure handoff and articles that standardized handoff protocol or checklist intervention. Sources of evidence were excluded if they did not include nurses or did not standardize handoff. Initially the project leader attempted to include only articles that sampled nurse handoff of surgical patients, but a lack of literature on this specific topic lead to a broader inclusion of handoff literature. A total of 11 articles were selected to be included in the review of literature and consisted of four systematic reviews, four qualitative studies, and three expert opinions or guidelines.

Once inclusion criteria were met, the project leader ranked the literature by level of evidence, appraised the literature, and evaluated the literature to ensure that the best evidence was utilized in the literature review.

Levels of Evidence

Each of the 11 sources in the review of the literature was assigned a level of evidence based on Melnyk and Fineout-Overholt's (2011) criteria. These criteria rank studies in a seven level system, with level I being the highest level of evidence and level VII being the lowest level of evidence (Melnyk & Fineout-Overholt, 2011). The criteria take into account study methods, qualitative or quantitative data collection, and

Table 2.1

Literature Search Results

Database	Search Terms	Articles found	Date Range	Limiters	Results	Relevant	Double Articles	Articles Used
Cinahl	(periop* OR intraop*) AND (handoff* OR handover*)	18	2005-present	Peer reviewed, scholarly journals, articles, English language	18	7	2	5
ProQuest	(periop* OR intraop*) AND (handoff* OR handover*)	368	2005-Present	Peer reviewed, scholarly journals, articles, English language Added search term: SBAR	43	8	4	3
Medline (Ebsco-HOST)	(periop* OR intraop*) AND (handoff* OR handover*)	43	2005-Present	English, academic journals	39	9	3	2
Medline (PubMed)	(periop* OR intraop*) AND (handoff* OR handover*)	45	2005-Present	English language	41	10	7	1
Cochrane Library	(periop* OR intraop*) AND (handoff* OR handover*)	2	2005-Present	Not Applicable	2	0	0	0
JBI	(periop* OR intraop*) AND (handoff* OR handover*)	5	2005-Present	Not Applicable	5	0	0	0

authorship of the study. Level I evidence was considered a systematic review including relevant randomized control trials (RCTs) while level II evidence was a well-designed RCT (Melnyk & Fineout-Overholt, 2011). Level III evidence was a well-designed control trials without randomization and level IV evidence was a case control or cohort study (Melnyk & Fineout-Overholt, 2011). Level V evidence was a systematic review of descriptive or qualitative studies (Melnyk & Fineout-Overholt, 2011). Level VI evidence was a single descriptive or qualitative study (Melnyk & Fineout-Overholt, 2011). Finally, level VII evidence was considered expert opinion from authorities or committees (Melnyk & Fineout-Overholt, 2011). One systematic review was ranked a level 1 (Abraham, Kannampallil, & Patel, 2014), three of the four systematic reviews consisted of qualitative studies and were ranked as a level 5 (Holly & Poletick, 2013; Ong & Coiera, 2011; Riesenberg, Leitzsch, & Cunningham, 2010), due to qualitative evidence being less reliable than quantitative evidence. Four original studies were all qualitative and assigned a level 6 ranking due to data collection methods. The remaining three guidelines are considered a level 7 as they are expert opinions (Petrovic, Martinez & Aboumatar, 2012; Shewchuk, 2014; Seifert, 2012).

The great majority of the evidence addressing perioperative nurse handoff was qualitative and the inclusion of this evidence in the review of literature was necessary. The authors of the included studies assessed the quality of the studies by using more than one researcher or expert and combined results when it was appropriate to do so. Various similar themes were reported, but due to the qualitative nature of the studies precise results were not achievable. With all of this considered, there was little to no quantitative evidence to consider and the limitations of the qualitative methods were

discussed and recommendations for improved research tools are made. The results were easily transferable to local organizations and also appropriate in national mandates (Abraham et al., 2014; Holly & Poletick, 2013; Ong & Coiera, 2011; Riesenberg et al., 2010), as seen in an expert opinion. The intent of restating this information is to make the reader aware of the types of current literature available during the literature review within this paper and the lack of high levels of evidence.

Appraisal of Relevant Evidence

The four systematic reviews and four single studies in the literature review were appraised prior to inclusion using the Critical Appraisal Skills Programme (CASP) criteria (CASP, 2013). The remaining three guidelines were appraised using Melnyk and Fineout-Overholt's checklist for evidence-based clinical practice guidelines (Melnyk & Fineout-Overholt, 2011). Scores were assigned by the project leader based on the criteria on Melnyk and Fineout-Overholt's (2011) ranking system. Decisions about quality were made after appraisal and based on checklist completeness (CASP, 2013).

Quality scores for the guidelines were based on Melnyk and Fineout-Overholt's (2011) appraisal criteria and take into account whether the recommendations were considered valid, reliable, and applicable. If the guideline fulfilled all three requirements, it was considered good (Melnyk & Fineout-Overholt, 2011) and received the highest ranking. If the guideline fulfilled any two of the requirements, it was considered fair and if the guideline only met one requirement it was considered the lowest ranking, poor (Melnyk & Fineout-Overholt, 2011).

The quality scores for the four systematic reviews and four single studies were derived from the CASP criteria and based on three criteria: validity of the study, validity

of results, and usefulness of results (CASP, 2013). Similar to the appraisal ranking listed above, if the study met all three criteria it was called good (CASP, 2013) and received the highest ranking. However, if the study only met two criteria it was fair and if one or none of the criteria were met the study was considered poor, the lowest ranking (CASP, 2013).

The three systematic reviews from qualitative studies were considered good evidence based on the CASP criteria as they all clearly focused on a research question, made use of proper evidence, and used adequate means to evaluate the qualitative data (Holly & Poletick, 2013; Ong & Coiera, 2011; Riesenberg et al., 2010). These reviews did well describing methodology, reporting results, and relating the results' importance to nursing knowledge. The remaining review was considered good evidence as it included random control trials (RCT) and quantitative data, reported its methods for synthesizing results, provided a concise synthesis of data, and consolidated useful data (Abraham et al., 2014).

The four qualitative single studies all made a clear statement about the aims of the research. The qualitative methodology was appropriate as the researchers collected data by observation, self-report, questionnaires, interviews, or interpretive audit. The qualitative methodology was apparent as well as recruitment strategies, data collection methods, limitations of each study, and ethical considerations. Unfortunately, the relationship between the researcher and participants was never discussed and it was disappointing that none of the studies reported on this factor (Greenberg et al., 2007; Joy et al., 2011; Nagpal et al., 2012; Petrovic et al., 2014). The data analysis for all the four single studies cannot be considered rigorous given its qualitative nature, but the

discussion of limitations and tests when appropriate show adequate interpretation of collected data. The four studies were considered good evidence for this proposed EBP project (Greenberg et al., 2007; Joy et al., 2011; Nagpal et al., 2012; Petrovic et al., 2014) based on the CASP tool's criteria of study validity, reporting results, and applicability of results (CASP, 2013).

Finally, the three guidelines were expert reviews by organizations calling for national handoff mandates (Petrovic et al, 2012; Seifert, 2012; Shewchuk, 2014). These guidelines included information on the developers, stakeholders, and if applicable related sources funding. No development strategies were relayed but all cited the Joint Commission or WHO recommendations for handoff and built those factors into the guideline. Literature reviews were conducted in all three expert opinions, they were all peer reviewed, and specific recommendations were made. The intent of these guidelines were explicitly reported and clinically relevant in that they are aimed at direct patient care and feasible to carry out. Most of the data supporting these guidelines was qualitative up to the time of this project. These guidelines were considered to be fair evidence as they meet the criteria for validity and applicability, but lacked in the criteria of reliability (Melnyk & Fineout-Overholt, 2011). These guidelines provided recommendations which were based on evidence and recommended interventions specific to the problem they address. There were no reported results to the efficacy or application efforts of the recommendations and this prevented any conclusions about the guidelines' reliability (Melnyk & Fineout-Overholt, 2011).

Review of the Literature

The evidence selected by the project leader was primarily qualitative based on the study design and data collection for each systematic review and study. The recommendations for the topic were so new that most of the evidence was published from 2006 to 2008 (Riesenberg et al., 2010) and there was no widely accepted single tool for data collection. Often researchers used interviews, observation, and questionnaires in the selected studies and reviews to gather their data (Abraham et al., 2014; Greenberg et al., 2007; Holly & Poletick, 2013; Joy et al., 2011; Nagpal et al., 2012; Ong & Coiera, 2011; Petrovic, Aboumatar, & Scholl, 2014; Petrovic et al., 2012; Riesenberg et al., 2010; Seifert, 2012; Shewchuk, 2014). The qualitative nature of the literature did not take away from the importance of the topic of handoff communication in perioperative nurses, but it did make evidence-based practice recommendations more difficult.

Each source of evidence was thoroughly examined and assigned a level of evidence. Articles were selected based on the inclusion and exclusion criteria previously discussed so that only literature relevant to the topic of this project was included in the literature review. Each appraisal tool was used to evaluate the content, methodology, data collection, and conclusions of the studies. Below in the literature review the results of the included studies are described and a summary of study level of evidence, population, sample, methods, interventions, and result synthesis can be found in the Methods Summary Table 2.2.

Table 2.2

Methods Summary

Authors, Article, Level of Evidence, & Year Published	**Design, Sample & Procedure**	**Data Evaluation**	**Observation of Handoff**
Abraham, Kannampallil, & Patel A Systematic Review of the Literature on the Evaluation of Handoff Tools: Implications for Research and Practice Level I 2014	Systematic Review Literature search of PubMed, Cochrane, and CINAHL Inclusion Criteria: articles on handoff tool evaluation for healthcare practice, English language, peer-reviewed Exclusion Criteria: handoff articles examining barriers, design or development of tools, or evaluation of process-based strategies to handoffs 36 Articles: 3 Random Control Trials (RCT),15 Non-randomized pre-post design, and 18 Observational studies	Quality Scoring System: 12 items with a maximum score of 16 points Riesenberg's Rating Scale: tool specifically for evaluating the quality of handoff related studies	Evaluation of Nurse Handoff Tools by researcher of article
Holly & Poletick A Systematic Review on the Transfer of Information During Nurse Transitions in Care Level V 2013	Systematic Review of Qualitative Studies Initial search in MEDLINE and CINAHL, a second search using keywords, and a third in references of all articles. Inclusion Criteria: qualitative studies determining nurses' handoff experiences 29 articles: 21 ethnocentric, 3 case studies, 2 qualitative descriptive, 1 phenomenological, 1 action research	Qualitative Assessment Review Instrument (QARI) by Joanna Briggs Institute	Nurse Handoff

Table 2.2 Continued

Authors, Article, Level of Evidence, & Year Published	Design, Sample & Procedure	Data Evaluation	Observation of Handoff
Ong & Coiera A Systematic Review of Failures in Handoff Communication During Intrahospital Transfers Level V 2011	Systematic Review of Qualitative Studies Search of MEDLINE Inclusion Criteria: Investigation on why handoffs fail during intrahospital transport, English, and keywords. 24 qualitative studies: 19 primary practice studies & 5 interventional studies	No reported methods	Nurse Handoff
Riesenberg, Leitzsch, & Cunningham Nursing Handoffs: A Systematic Review of the Literature Level V 2010	Systematic Review of Qualitative Studies Literature search of Ovid MEDLINE, Ovid MEDLINE InProcess & Other Non-Indexed Citations, CINAHL, HealthSTAR, and Christiana Care Full Text Journals@Ovid (01/1987-08/ 2004). Inclusion Criteria: English; indexed in Ovid 95 studies: 50 anecdotal, 15 interventional without a control group, 5 abstracts, 5 reviews, 3 cross-sectional, 3 editorial, 2 commentary,1 qualitative study, 1 cohort study, & 1 letter.	Trained reviewers determined if articles met criteria for initial review with a detailed abstraction form. Any disputes were Quality Scoring System: scores 1-16, with 16 being the highest score settled by a third reviewer.	Nurse Handoff Standardization: communication skills, strategies, technologic solutions, & education, staff involvement and leadership, environmental strategies, training

Table 2.2 Continued

Authors, Article, Level of Evidence, & Year Published	Design, Sample & Procedure	Data Evaluation	Observation of Handoff
Joy, Elliot, Hardy, Sullivan, Becker, & Kane Standardized Multidisciplinary Protocol Improves Handover of Cardiac Surgery Patients to the Intensive Care Unit Level VI 2011	Prospective Interventional Study Convenience sample of nurses 79 total handover observations: 41 pre-intervention and 38 post-intervention Direct observation	Statistical Analysis: Two sample nonparametric *t* test equivalent, Summary score, and Wilcoxon rank sum test.	Nurse Handover between OR and CICU
Nagpal, Arora, Vats, Wong, Sevdealis, Vincent, & Moorthy Failures in Communication and Information Transfer across the Surgical Care Pathway: Interview Study Level VI 2012	Grounded Theory Qualitative sampling frame to ensure a broad spectrum of professional characteristics (sampling stopped with saturation of categorical needs were met) 18 healthcare professionals: 7 surgeons, 5 anesthetists, 6 nurses (2 ward, 2 recovery, 2 operating room) Semi structured Interviews	Three researchers independently coded and interpreted all transcripts in all stages. Member checks performed to ensure accurate data interpretation	Preoperative, intraoperative, and postoperative communication phases

Table 2.2 Continued

Authors, Article, Level of Evidence, & Year Published	Design, Sample & Procedure	Data Evaluation	Observation of Handoff
Petrovic, Aboumatar, Scholl, Krenzischek, Camp, Senger, Chang, Jurdi, & Martinez The Perioperative Handoff Protocol: Evaluating Impacts on Handoff Defects and Provider Satisfaction in Adult Perianesthesia Care Units Level VI 2014	Prospective pre-post unblended study Convenience sample and observation of 50 nurse handoffs in the pre-intervention and post-intervention phases. Handoff form & satisfaction survey	Statistical Analysis: 2-sample *t* test and Mann-Whitney *U* test, Fisher exact test	OR-PACU Nurse handoff
Greenberg, Regenbogen, Studdert, Lipsitz, Rogers, Zinner, & Gawande Patterns of Communication Breakdowns Resulting in Injury to Surgical Patients Level VI 2007	Grounded Theory Randomized Purposive Sample 60 closed insurance claims were reviewed by surgical residents, fellows, and board certified surgeons trained by the researchers and assisted by a manual. Inclusion criteria: closed claims involving surgical error that led to patient injury	Two surgeon-investigators conducted independent secondary reviews and classified the cases by communication breakdown type and contributing factors	Surgical patient injury that led to the filing of an insurance claim

Table 2.2 Continued

Authors, Article, Level of Evidence, & Year Published	Design, Sample & Procedure	Data Evaluation	Observation of Handoff
Petrovic, Matinez & Aboumatar Implementing a Perioperative Handoff Tool to Improve Postprocedural Patient Transfers Level VII 2012	Practice Guideline Johns Hopkins Hospital Reviewed: Unknown	Development of a protocol for OR team to ICU/PACU nurse postoperative handoff	OR-ICU/PACU Handoff Protocol Recommendations
Seifert Implementing AORN Recommended Practices for Transfer of Patient Care Information Level VII 2012	Practice Guideline Association of periOperative Registered Nurses Reviewed: Unknown	Education of perioperative nurses in recommended practices for transfer of patient care information	Perioperative nurse communication during patient transfer
Shewchuk Standardization: Perioperative point of care best practice Level VII 2014	Practice Guideline Operating Room Nurses Association of Canada Reviewed: Unknown	Standardization of communication and practice promotes a common goal of safety, accuracy, efficacy, efficiency, and quality.	Standardization of operating nurse communication and professional performance

Systematic reviews.

The purpose of the first systematic review was to investigate how handoff tools in practice were evaluated (Abraham et al., 2014). The review included three RCTs, 15 non-randomized pre-post designs, and 18 observational studies for a total 36 studies. A variety of theories were used to guide the reviewed studies. Theories included Information Processing 89% (*n = 32*), Distributed Cognition 25% (*n = 9*), Accountability 12% (*n = 4*), Cultural Norms 5% (*n = 2*), and Social Interaction 2% (*n = 1*). A total of 88 studies were fully appraised for quality using the Quality Scoring System, a 12 item scale with a maximum score of 16 points, and Riesenberg's Rating Scale, tool specifically for evaluating the quality of handoff related studies, prior to selecting the 36 included studies (Abraham et al., 2014).

The majority of the studies measured handoff tool effectiveness, efficiency, and user satisfaction. Handoff tool effectiveness was measured in 59% (*n = 21*) of the studies; 48% (*n = 10* of 21) of tools were paper while 24% (*n = 5* of 21) were electronic, and 29% (*n = 6* of 21) were integrated. The review did not report individual statistics from the studies regarding the effectiveness of each type of tool as it only reported if authors of studies evaluated the tools by effectiveness, efficiency, or user satisfaction. Handoff tool efficiency was measured in 34% (*n = 12*) of studies by means of a variety of measures including 33% (*n = 4* of 12) electronic stand alone, 25% (*n = 3* of 12) paper based, and 42% (*n = 5* of 12) were Electronic Medical Record (EMR) integrated. There were no particular conclusions relayed about these formats, only the types of tools chosen by researchers. Finally, about half of these studies measured user satisfaction as 53% (*n = 19*) by means of EMR based tools (48%, *n = 9* of 19), electronic standalone

tools (27%, *n* = *6* of 19), and paper based tools (22%, *n* = *4* of 19). Again, specific findings from individual studies were not reported as the goal of the review was to investigate how researchers evaluated standardized handoff tools (Abraham et al., 2014).

Measurement of data was done by means of questionnaires (70%, *n* = *25*), audit of handoff documents (42%, *n* = *15*), interviews (20%, *n* = *7*), log-file analysis (12%, *n* = *4*) and observation (14%, *n* = *5*). Interestingly, only 2 articles used patient related outcomes (Abraham et al., 2014). Only 34% (*n* = *12*) of the studies reported tools specifically for nurse handoff and 34% (*n* = *4* of 12) of all tools were electronic while 16% (*n* = *2* of 12) were integrated with the EMR. The use of handoff tools for inter-departmental handoff use was 5% (*n* = *2*) and intra-departmental handoff use was 94% (*n* = *34*). A major outcome in this review was the positive impact of standardization of handoff and this was due to 81% (*n* = *29*) of the articles using a standardized measure. This systematic review concludes by reporting that a key aspect of using a paper based tool for handoff is single page organization (Abraham et al., 2014). It may be considered a weakness of the systematic review that there were no conclusions regarding which type of tool was the most effective, efficient, or satisfactory; however, the researchers' purpose for this study was to synthesize how other researchers measured the effectiveness, efficiency, and satisfaction of standardization tools. In this way the evaluation process of tools was under scrutiny and not the tools themselves (Abraham et al., 2014).

The second systematic review by Holly and Poletick (2013) consisted of 29 qualitative studies and the purpose of the review was to discover how determinations

were made as to what information was transferred during transition of care between nursing shifts. The factors that influenced what information was transferred during the handoff were also examined.

This review found 117 factors that impacted what information was transferred between nurses during handoff. These factors were grouped together using the Qualitative Assessment Review Instrument (QARI) by Joanna Briggs Institute, which was a program that aggregated data in relation to phenomena under study. These were grouped into 16 categories: status inequality; necessity for control; a time of testing; seeking approval; learning the ropes; the ritual nature of nursing units; team cohesiveness; other handoff functions; formulaic structure of reports; nurse controls the information flow and chooses the information to act upon and use; transitory nature of nurses' reports; ambiguity and labelling; sharing insights; incongruence between written; verbal and observed reports; random presence of the patient's voice; and no time, no place (Holly & Poletick, 2013).

Two main findings resulted from this systematic review. First, individual nurses influenced patient care as gatekeepers of information. Second, there was a hierarchy in relation to handing over information. This review also acknowledged that the evidence showed an incongruence of handoff content between written and verbal report styles. In order to combat these findings, the authors of the review recommended the use of a handoff tool for structure and the use of a one page printed handoff sheets. The SBAR mnemonic was considered the most common format for standardization tools (Holly & Poletick, 2013).

The third systematic review investigated why handoffs fail during intrahospital transport (Ong & Coiera, 2011). Twenty-four qualitative studies consisting of 19 primary studies on handoff practices and deficiencies and five interventional studies were included. These sources of evidence were organized into six groups based on the destination of patients in transport. The first section of the review investigated the handoff conducted before the transport of critically ill patients and included two articles. The first study cited 176 critical incidents where communication and liaison issues were the most common factors in 47 adverse outcomes. There was no analysis of communication errors reported or any methods of data interpretation. The second study showed 97 intrahospital transports where poor communication with staff contributed to delays (Ong & Coiera, 2011).

The second section looked into critical care to specialty ward handoffs and included five studies. The researchers in the first study showed 43% of participants identified communication as the most important factor in the discharge process and that there was a lack of handoff policy so communication between staff was variable. A second study showed nurses reported the need for improved handoff communication and newer nurses showed higher anxiety when receiving patients from the ICU. The remaining studies focused on the role of an ICU liaison facilitating patient transfer and benefits were reported as increased communication, coordination, and the liaison as a communication conduit (Ong & Coiera, 2011).

The third section considered handoffs in the OR and included six studies assessing preoperative and/or postoperative handoffs. However, three of the six were published by the same author within three months and it is unknown if these studies

were from the same data source. A seventh interventional study was also included. In one study, communication errors were equally distributed in three phases of care (preoperative 38%, intraoperative 30%, and postoperative 32%) with 43% of communication errors occurring at handoff and 39% during intrahospital transfers. Postoperative handoff was especially poor with transfer of 66% of patient information, 67% of anesthesia information, and 30% if surgical information. This study then explored the degradation of information from the OR to the recovery room (Ong & Coiera, 2011). Finally, the interventional study examined handoff protocol between the OR and ICU which decreased technical errors from 5.42-3.15 ($p < .001$) and reduced information omission from 2.09-1.07 ($p = .003$). The remaining studies examined handoff between anesthesia and recovery nurses. Information omission was a common concern, 67% of postoperative handoffs information was not verbally transferred, and surgical handoff was very poor (Ong & Coiera, 2011).

The last three sections of this systematic review included handoff in the emergency room, during transfer of oncology patients, and between wards and radiology. The emergency room section included seven studies with one study finding handoff was implicated in adverse events. Twenty-nine percent ($n = 246$) of physicians reported patient events or near misses after ED transfers and 36 errors were identified. Failure to report vital signs ($n = 10$ of 36) was most common. Other studies reported delayed handoff, communication barriers, high workload, communication failure, and nursing handoff as problems attributing to patient safety. In one study of oncology patients, a pharmacist handoff intervention reduced errors (3.97 to 0.45, $p < .0001$) and omissions (100% to 68%, $p = .001$) in prescribing and administering drug therapy. Lastly

the section regarding handoff between wards and radiology also included one study which showed an average of four errors per transfer after viewing 101 transfers. Most commonly handoff errors (*n = 181*) and failure to verify patient errors (*n = 176*) were reported (Ong & Coiera, 2011).

The fourth and final systematic review in this EBP project, completed by Riesenberg and colleagues (2010), reviewed studies regarding nursing handoff conducted in the United States and included a total of 95 studies. A total of 55 (58%) of the studies were published between 2006-2008 in response to the Joint Commission's National Patient Safety Goals, issued in 2006. One third or 33 (35%) of these articles made use of a handoff mnemonic and 14 studies identified the SBAR mnemonic making it the most commonly used method for handoff.

The Quality Scoring System was used to score all studies in the review for study quality prior to inclusion. Scores range from one to sixteen, with sixteen being the highest score (Riesenberg et al., 2010). Quality assessment scores for the 20 (21%, *N* = 95) research articles ranged from 2-12 (range 1-16). Of the 20 research articles 15 (75%) used an intervention, seven did not provide a sample size, 11 had small samples (10-54), and two reviewed shift report accuracy. The review determined that written, problem oriented forms were more concise but did not measure accuracy of content. This conclusion was supported by evidence from a standardized report done in an emergency department which yielded greater accuracy, increased nurse and patient satisfaction, and saved nurses time (Riesenberg et al., 2010).

This review also included barriers to communication and identified eight major categories: communication barriers, problems with standardization, equipment issues,

environmental issues, lack of or misuse of time, difficulty related to complexity of cases or high caseload, lack of training or education, and human factors. Strategies for combatting these barriers included standardization, technologic, communication, providing training, and ensuring recognition of transfer of care (Riesenberg et al., 2010).

Qualitative studies.

Joy and colleagues (2011) investigated the creation and implementation of a standardized handover protocol to reduce the errors that occur during patient transitions from the OR to the ICU after pediatric cardiac surgery. A total of 79 handovers were conveniently observed, with 41 pre-intervention and 38 post-intervention. Results showed that technical errors decreased from 6.24 (95% confidence interval [CI], 5.57-6.91) to 1.52 (95% CI, 1.01-2.02; $p < .0001$) and information omissions decreased from 6.33 (95% CI, 5.57-7.10) to 2.38 (95% CI, 1.74-3.01; p < *.0001*) with the use of a standardized handoff protocol. There was no significant difference in frequency of realized errors 17% (95% CI, 0.04-0.30) to 11% (95% CI, 0.003-0.22; $p = .51$). Another result was that anesthesia verbal handoff time did not increase (2.9 mins to 2.9 mins; $p = .7$); this was reflected in the overall handoff time which did not increase (8.8 mins to 9.8 mins; $p = .27$). The time to transition from central venous pressure monitors to bedside monitors was significantly reduced (20.5 mins to 6.3 mins; $p < .0001$), but there was no difference in time transferring patients from other monitoring modalities (arterial blood pressure, near infrared monitoring, noninvasive blood pressure, and pulse oximetry). Interestingly, the time to obtain post admission chest radiographs was not affected (20.7 mins to 18.8 mins; $p = .15$) while the time required to definitively secure endotracheal tube was significantly decreased (75 mins to 54.4 mins; $p < .05$). Finally,

the standardized handoff protocol implementation improved teamwork (Likert median 4 to 5; $p < .05$) and information received (Likert median, 4 to 5; $p < .05$) (Joy et al., 2011).

The second study by Nagpal and colleagues (2012) article sought to explore Information Transfer and Communication (ITC) failures across the entire surgical journey of patients during their hospital stay. This study specifically considered causes, impact and potential interventions of ITC failures. Qualitative individual interviews were conducted in three phases of patient transfer: preoperative, intraoperative, and postoperative. Preoperative assessment and optimization, preprocedure teamwork, postoperative handover, and daily care were found to be the most vulnerable areas to errors via hazard analysis.

In the preoperative assessment and optimization phase, transmission errors were most common per clinicians and all surgeons acknowledged a lack of interdisciplinary and intradisciplinary communication. There were multiple modes of information transfer which contributed to information loss. Preprocedure teamwork showed that poor handover from the ward to the OR was a main problem and 8/18 healthcare professionals felt that communication failures occurred in the OR team before surgery which lead to omission of preoperative checks (Nagpal et al., 2012). Many failures during postoperative handoff were attributed to incomplete handover as information was missing or incomplete. The handover process was mentioned by all participants as informal, unstructured, and inconsistent. The surgical team was often not present in this phase and critical surgical information might not have been handed over. The most common source failures in the daily ward were followed by transmission failures as well as staff shortages, multiple handovers and multiple teams

simultaneously rounding. Information in this phase was described as fragmented (Nagpal et al., 2012).

Nagpal and colleagues (2012) reported that causes of ITC failures were work environment factors and rapid turnover of staff. The effects of ITC failures were direct and indirect patient harm and damage to team dynamics which caused stress in team members. The interventions recommended included a structured, organized and transparent ITC by means of a checklist or smart card and culture changes. The need for standardization and information transfer tools was heavily stressed.

Petrovic and colleagues (2014) published the third article explored if the implementation of a standardized handoff protocol would reduce the number of perioperative communication errors and technology transfer defects during the handoff process. They hypothesized that communication between team members would increase provider satisfaction without increasing transition time. A total of 103 handoffs were observed in two phases of the study with 53 in the pre-intervention phase and 50 in the post-intervention phase. The intervention made use of The Perioperative Hand Off Protocol which consists of five steps. Results of the study showed that the duration of handoff increased from 9.0 to 11.0 minutes ($p = .01$) and that the time from patient arrival in PACU to handoff start decreased from 4.4 to 2.9 minutes ($p = .01$). Surgery providers' participation in handoff increased from 21% to 83% ($p < .01$) and the number of defects per handoff decreased from an average of 9.92 to 3.68 per handoff ($p < .01$). Missed information items from surgery and anesthesia report decreased from 7.57 to 1.2 per handoff ($p < .01$). The number of technical defects decreased from 0.34 to 0.10 per handoff ($p = .04$) (Petrovic et al., 2014).

A total of 105 surveys were completed pre-intervention and 142 surveys were completed post-intervention, with 4 surveys completed per handoff. Results showed that there was an increase in PACU nurses that agreed with all 9 items on the survey, with statistical significance pertaining to satisfaction with handoff from anesthesia, potential problems, follow up items, physical transferring of monitors, and anticipatory guidance. Anesthesia ratings decreased without significance per satisfaction with OR-PACU handoff, ability to hear all the report, physical transferring of monitors, and clarity with starting and ending of handoff processes (Petrovic et al., 2014).

The fourth and final article by Greenberg and colleagues (2007) was also qualitative and its goal was to develop and prioritize initiatives to prevent communication breakdown resulting in injury to surgical patients. This study conducted a review of 444 claims for malpractice cases that lead to a close examination of 60 cases of communication breakdown by senior surgical residents, surgical fellows, and board certified surgeons who were assisted by a manual (Greenberg et al., 2007). Out of the 60 cases, 81 communication breakdowns were observed. These were equally likely to have occurred in any of the three phases with thirty-eight percent in the preoperative phase, thirty percent in the intraoperative phase, and thirty-two percent in the intraoperative phase. A total of ninety-two percent of communication breakdowns were verbal and sixty-four percent occurred between a single transmitter and a single receiver. Most often information was never transmitted (forty-nine percent) or it was communicated and wrongly received (forty-four percent). Interestingly, thirty-nine percent of communication errors related to intraoperative events and thirty-two percent

were regarding patient status. Fourteen percent (*n = 11* of 81) communication breakdowns involved a miscount during intraoperative phase.

Excluding miscount errors, communication errors in the phases changed to thirty four percent preoperatively, thirty-seven percent postoperatively, and nineteen percent intraoperatively. The researchers conducting this study also found an increase in single transmitter to single receiver errors to seventy one percent, increased information never transmitted to fifty-seven percent decreased wrongly received information to thirty-five percent, increased patient status errors to thirty-seven percent, and decreased intraoperative events errors to thirty-two percent. Ambiguity about roles occurred in fifty-eight percent of cases with communication errors and communication breakdowns in handoffs among providers occurred forty-three percent of these same cases. Errors occurred in thirty-nine percent of these cases involving transfer of the patient from one point of care to another (Greenberg et al., 2007). The researchers developed its own interventions and began this process by creating a list for better recognition of a set of trigger events. It also standardized readbacks and structured protocols, which could have prevented eleven to thirty-five percent of the 60 cases (Greenberg, et al., 2007).

Expert opinions.

The first expert opinion or guideline was developed by Petrovic and colleagues (2012) at John's Hopkins Hospital. This guideline described a perioperative handoff tool that is designed to improve information transfer and enhance social interaction, communication style and accountability of the members of the handoff team (Petrovic et al., 2012). The recommended intervention in this guideline is the use of the Perioperative Hand Off Protocol and Checklist, which consists of five steps. This

checklist was recommended for transfer of patients from the OR to the PACU or intensive care unit (ICU) and was intended to fulfill the Joint Commission requirements for handoff. The authors of this guideline explained that there are many phases to patient care including: prehandoff, physical transport, transfer of technology, transfer of information, and assumption of care. In fact, over 50 steps were identified to the handoff process in the development of this protocol.

The handoff team members included the anesthesia provider, surgery provider, OR nurse, ICU/PACU provider, and ICU/PACU nurse. The Perioperative Hand Off Protocol began with all members at the bedside. Step one was when the anesthesia provider stated the patient's name, stated his/her own name, asked the rest of team to do so, and began monitor/line setup. Step two was monitor and line setup and it was important not to begin report until the nurse completed the monitor/line setup. Step three involved the surgeon giving report by following the surgery report checklist, ending by sharing what worries him/her most about the patient, and allowing time for questions. The surgery report checklist items included the actual surgery performed, surgical findings, surgical complications, special instructions, patient disposition, responsible primary service, and who to page (Petrovic et al., 2012).

The fourth step of the protocol was anesthesia and OR nurse report. The team members were to follow the checklist, end by sharing what worries him/her most about the patient, and allow time for questions. The nurse report checklist items included the actual surgery performed, isolation type, lines, drains, skin inspection, packing, special equipment/other, family information, belongings and valuables, and any intraoperative events or concerns.

The OR nurse should provide handoff report in person, whenever possible and the OR nurse's report can be delivered prior to or after the surgeon's report. A communication should also be made by the OR nurse to the receiving unit team prior to the patient arrival to inform them about anticipated arrival and any special patient needs. The fifth and final step was the ICU or PACU provider and nurse clarifying any remaining issues and announcing "Handoff is now complete" (Petrovic et al., 2012).

The second guideline by Seifert (2012) was endorsed by AORN and focused on the education of perioperative nurses in recommended practices for transfer of patient care information. According to the guideline, 80% of serious medical errors were associated with handoff miscommunication. Specifically barriers to perioperative communication barriers were insufficient information, pressure to hurry, lack of clarity about procedure, interruptions, distractions, and others. The AORN handoff toolkit recommended several mnemonic phrases and the SHARE project with increased consistency and reliability of patient handoff by employing strategies to Standardize content (i.e. SBAR, I PASS the BATON, SURPASS, SHARED), Hardwire behaviors (WHO checklist), Allow questions, Reinforce quality, and Educate. The key to this method is to engage in open multidisciplinary discussion to arrive at procedures and activities that fit a nurse's situation. AORN also recommends standardizing the communication process, encouraging multidisciplinary involvement, using verbal and written techniques, developing a protocol, and involving patient families in communication.

Shewchuk (2014) is the author of the third guideline, which was developed by the Operating Room Nurses Association of Canada (ORNAC) and stated that

standardization of handoff infers a common goal of safety, accuracy, efficacy, efficiency, and quality. This recommendation was based on the concept that perioperative handoff is vulnerable to issues including multiple circulating nurses involved with each case set up, counts, break relief and shift changes. Standardization should pertain to all OR practices, which are delineated within the guideline, and should be followed by circulating and scrub staff. However, practice varied greatly from one OR to another and challenging areas include: nomenclature, labeling and location; noncompliance with instrument table and mayo stand setup; and stress, intimidation and fear for trainees, rotators, and team.

The standardization process included management, educators, clinical leaders, quality improvement, and safety designees who must work as an integrated unified team to establish the framework, content for policy, procedures and practices. The delineation of roles, responsibility, accountability, expectations, audit process and consequences for sustained outcomes should be clear to all employees (Shewchuk, 2014).

Management, quality improvements and safety requirements involved reviewing, updating, approving and communicating all expectations to staff. There should also be a Clinical Practice Committee which is allowed time for meeting and provided support for communication tools and processes. The root cause of errors should be examined for the lack of standardization or process noncompliance. Also, there should be established guiding principles for patient safety, reviews of the count procedure and compliance standards in place (Shewchuk, 2014). Educators and clinical leaders should document current practices and expectations, assess current level of standardization and

compliance, supervise staff for compliance, determine the audit process, post posters for standardized instrument setup, and standardize OR supply by item (Shewchuk, 2014).

The Clinical Practice Committee was responsible for determining the issues and prioritizing them, determining specific projects to standardize at one time, standardizing setup order of case carts to promote organization, establishing best practice standards with rationales, ensuring communication teaching strategies are in place and implemented, and developing a process to list, change and communicate key concerns (Shewchuk, 2014). Communication strategies included the use of stories from actual events to demonstrate a need for change, post projects and process changes, open communication (reports, emails, posters, newsletters, education sessions, etc.), and the celebration and acknowledgement of sustained success for positive motivation (Shewchuk, 2014).

Finally, all the staff have a professional responsibility that included being informed, continuing education as a lifelong requirement, mentoring teammates to maintain standardization requirements, communicating with and taking part in CPC to promote, and implementing and sustaining standards (Shewchuk, 2014). As mentioned previously, this guideline recommended standardization for all OR practices, including handoff, in order to promote high standards of care among all OR staff (Shewchuk, 2014).

Construct the EBP

Synthesis

The most prominent theme from the evidence was standardization of handoff communication by means of a mnemonic phrase or protocol. The use of standardized interventions alone promoted more consistent communication during patient transition (Abraham et al., 2014; Greenberg et al., 2007; Holly, & Poletick, 2013; Joy et al., 2011; Nagpal et al., 2012; Ong & Coiera, 2011; Petrovic et al., 2014; Riesenberg et al., 2010), reduced communication errors and omissions (Abraham et al., 2014; Greenberg et al., 2007; Holly, & Poletick, 2013; Joy et al., 2011; Nagpal et al., 2012; Ong & Coiera, 2011; Petrovic et al., 2014; Riesenberg et al., 2010), and promoted team member satisfaction (Holly, & Poletick, 2013; Joy et al., 2011; Nagpal et al., 2012; Ong & Coiera, 2011; Petrovic et al, 2012). The recommendations based on the literature were to standardize and organize communication and promote the use of one communication tool for handoff among staff.

The proposed evidence-based practice project fulfilled the requirements from the literature by considering the recommendations and implementing a standardized one page form to organize and provide structure to the handoff between OR and PACU nurses in order to reduce communication errors and promote patient safety. In this way the evidence had addressed the clinical question proposed by this paper (Abraham et al., 2014; Greenberg et al., 2007; Holly, & Poletick, 2013; Joy et al., 2011; Nagpal et al., 2012; Ong & Coiera, 2011; Petrovic et al., 2014; Petrovic et al, 2012; Riesenberg et al., 2010; Seifert, 2012; Shewchuk, 2014).

Best Practice Model

Based on the evidence from this literature review, the project leader had chosen the SBAR mnemonic as the basis for a one page written handoff form for OR nurse to PACU nurse handoff (see Appendix A). This intervention was chosen to address the clinical question: Will the use of SBAR during post procedure handoff serve to standardize handoff among perioperative nurses and reduce patient risks? After conducting the review of literature, it was hypothesized that the written SBAR handoff tool would accomplish the standardization of nurse handoff report from the OR to the PACU, promote perceptions of teamwork among perioperative nurses, and reduce risks to patient safety.

The proposed EBP project was implemented by methods similar to Lewin's three step Model of Change because of its practical application and simple structure. The methods of this project involved educating perioperative nurses in order to change their equilibrium (*unfreezing*), providing a new standardized SBAR handoff tool for nursing handoff practice (*moving*), and allowing time for the perioperative nurses to practice this change on their own (*refreezing*).The research and literature review that was required to locate the best evidence fit into the Iowa Evidence-Based Model and reflected the shared focus on evidence based practice.

In order to monitor change in nurse handoff between the OR and PACU nurses, the project leader monitored completeness of the SBAR handoff form (see Appendix A) and asked the PACU nurses to evaluate the OR nurse handoff for comparison (see Appendix B). All participating nurses took the Safety Attitudes Questionnaire (see Appendix C) before the intervention and at the end of the study in order to measure

changes in nurse perceptions of teamwork, safety, job satisfaction, stress recognition, perception of management, and working conditions. Finally an audit of MIDAS reports, risk reports filed by nurses at the organization, was conducted to observe changes in events or near events regarding patient safety and communication errors in the PACU.

The educational component of this project (see Appendix D) occurred after two weeks of observation with the use of the handoff form for OR nurses and handoff evaluation form for PACU nurses. These forms were monitored for completeness and comparison to the forms completed during the last two weeks of the study. The education took place in the OR and PACU monthly department meetings and with a PowerPoint ® presentation adapted from the AORN Handoff Toolkit, which was available online to AORN members. The presentation covered the background of the national standardization requirements, three methods for achieving effective handoff, and discuss the application of these strategies in this project.

Answering the Clinical Question

The overwhelming conclusion found in the evidence was that standardization of nursing handoff promotes more accurate handoff, patient safety, teamwork among the perioperative team, and decreases the omission of information (Abraham et al., 2014; Holly & Poletick, 2013; Ong & Coiera, 2011; Riesenberg et al., 2010). The implementation of this intervention provided an answer to the clinical question but did not call for a change in nursing practice but rather creates a uniformity during communication that occurs many times per shift (Abraham et al., 2014; Holly & Poletick, 2013; Ong & Coiera, 2011; Riesenberg et al., 2010). The evidence was clear and perioperative nurses have already made handoff a part of their routine. All that

remained was for perioperative nurses to come together and give a handoff containing the right information for every patient transition from the OR to the PACU.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

The most important part of recognizing a need for change, aside from supporting the need in the evidence, is successfully implementing the proposed change within the system. This stage in the process required planning and protection of both patients and staff who are participating in changing the way things had been done. During this EBP project permission was asked of the IRB boards in the Community Healthcare system and Valparaiso University in order to guarantee the ethical treatment of all participants. After permission to begin this project was granted, the change process was monitored by the project leader in order to protect patient safety, ensure correct implementation of the SBAR intervention by perioperative nurses, and protect the confidentiality of participants.

This project collected data by means of a perioperative nurse handoff self-report and safety assessment questionnaire. It made use of a convenient sample of perioperative nurses and data collection was chosen by selecting all eligible pairs of forms. The measures of outcomes included perioperative nurse perceptions of safety by means of a questionnaire, reports of handoff received as well as self-evaluation of handoff content, and a MIDAS report audit were utilized to measure changes in patient safety.

Participants and Setting

The EBP project was set in the post anesthesia care unit, or PACU, at the time of handoff between the OR nurse and PACU nurse. The facility was a non-profit organization with 195 acute care beds, eight ORs, and eight PACU bays. At this

institution there was an average of 15-25 cases per day Monday through Friday, which lead to 75-125 cases per work week. A handoff occurred during every transfer of patient care from the OR to PACU. The participants in this project included nurses and neither anesthetists, surgeons, nor any other medical staff were be included in the sample. Any nurses who were working may be included during data collection.

Outcomes

There were several outcomes measured in this project. First, OR nurse and PACU nurse perceptions of teamwork, safety, job satisfaction, stress recognition, perception of management, and working conditions were measured by the Safety Attitudes Questionnaire (SAQ). The SAQ was used as a pretest and posttest measure before and after the nurses receive SBAR handoff education (see Appendix C) (The University of Texas Health Science Center at Houston [UTHSCH], 2015). A demographic form (see Appendix E) was filled out at the monthly department meetings for the OR and PACU nurses to collect data on characteristics of the participants. The posttest SAQ was filled out by perioperative nurses at the end of the project.

The second outcome measured were handoff items via a handoff evaluation form (see Appendix B) for OR nurses and a handoff evaluation form (see Appendix B) for PACU nurses. Later, the OR nurses were guided by an SBAR handoff form (see Appendix A) which was audited for completeness by the project leader and matched to the handoff evaluation form by the PACU nurse. These two forms were be paired by patient stickers and kept confidential by depositing into a locked box located in the PACU after completion.

These forms were developed by the project leader and follow explicit guidelines from the AORN handoff toolkit, which was compliant with both the Joint Commission and WHO checklist guidelines (AORN, 2012; TJC, 2015; WHO, 2008). The AORN recommendations were developed along the Joint Commission guidelines and are considered reliable because of extensive testing and use (AORN, 2012; TJC, 2015; WHO, 2008). Concerns for validity were addressed by means of simple administration, easy completion scoring, multiple similar sources reporting similar intervention content, and reported ease of use (AORN, 2012; TJC, 2015; WHO, 2008).

A third outcome measured was that of patient safety. In this particular hospital the quality department tracks MIDAS reports, which were incident reports that may be filed by any staff member. For the purposes of this project, patient events or near events involving communication errors were retrospectively audited and tallied upon project completion in order to allow the project leader to monitor changes in patient safety.

Intervention

The intervention for standardizing perioperative nurse handoff was to implement a one page written standardized from using the mnemonic phrase SBAR (see Appendix A). This mnemonic phrase was intended to improve nurse memory and stands for situation, background, assessment, and recommendation.

In order to aid the success of this intervention an education session was led by the project leader at the monthly staff meeting for both the OR and PACU departments. During the meeting the perioperative nurses will be informed of the project and introduced to the importance of the topic with a PowerPoint® presentation about standardizing handoff and the content of specific transitions of patient care. The

PowerPoint ® was a combination of slides from the patient handoff toolkit that has been made available to all members of the AORN (2012) and can be located on the organization's website. A copy of the education PowerPoint® can be seen in Appendix D (AORN 2012).

Planning

The length of the practice change and follow-up was six weeks and was divided into three two week phases. The first phase began with the introduction of the handoff evaluation form to both OR and PACU nurses, which was be used during every OR to PACU handoff. Two forms were always collected for each handoff, one from the OR nurse and one from the PACU nurse.

In phase two, the perioperative nurses were educated on the importance of standardizing handoff by the project leader with the educational PowerPoint ® during the monthly meeting. During this meeting the project leader gathered the demographic form and the initial SAQ. After these meetings, the OR nurses began using the SBAR handoff form and the PACU nurses will continue to evaluate the OR to PACU handoff with the handoff evaluation form. The OR nurses filled out the SBAR handoff form for every patient and the PACU nurses filled out the handoff evaluation form for every patient so that there were two forms filled out for each handoff. Throughout this phase the project leader was be available to educate and encourage perioperative nurse compliance with the SBAR handoff standardization.

In the third phase, the OR nurses continued to use the SBAR handoff forms and the PACU nurses continued to evaluate the handoff with the handoff evaluation forms. Just like in phase two, the OR nurses filled out the SBAR handoff form and the PACU

nurses filled out the handoff evaluation form for every patient so there were two forms filled out for each handoff. The distinction between phase two and phase three was that the project leader was not available to promote perioperative nurse compliance with the SBAR handoff standardization in phase three.

During all three phases, the nurses were required to label their respective forms with patient stickers so that two forms from every OR to PACU handoff could be matched. This way the nurses who filled out the forms remained anonymous and their privacy was protected. The nurses who filled out these forms were required to deposit them into a locked box located in the PACU in order to protect patient confidentiality. The OR nurses should give report and immediately deposit their forms in the locked box as they leave the PACU. Once the PACU nurse assumed care of the patient and has had time to fill out the correct form, it too should be placed in the same locked box as soon as it was completed. It should be noted that in phase one the OR and PACU nurses filled out the same form. The handoff evaluation form had boxes that must be checked in order to differentiate the nurse's department and shift so that data could be correctly associated to either the OR PACU. Forms were also color coded to avoid confusion, with OR forms being blue and PACU forms being green.

At the end of phase three, the project leader conducted a retrospective audit of MIDAS reports and gathered data regarding communication errors in the perioperative area. Special attention was paid to those communication errors occurring in the PACU and the goal was to observe any changes in reports that may indicate a decline in patient events and an increase in patient safety.

Recruiting Participants

This EBP project sampled any OR PACU nurses who happen to be working during the time of project implementation. The project was approved by the manager of both departments and the participation of all nurses was required. The identities of all participating perioperative nurses remained anonymous.

Data

Demographic data was collected on all the perioperative nurses in the OR and PACU and reported by department. The items included in the demographic form included age, race, gender, level of education, current employment status, years of practice, shift worked, length of shift, and department (see Appendix E).

The SAQ was developed by Bryan Sexton, Eric Thomas, and Bob Helmreich with funding from the Robert Wood Johnson Foundation and Agency for Healthcare Research and Quality (UTHSCH, 2015). This project made use of the short SAQ form (see Appendix C), as recommended by the developers, and its use was specifically intended to measure medical staff perceptions of safety in the workplace. The SAQ was a 36 item, six category self-assessment questionnaire scored on a Likert scale (UTHSCH, 2015).

The two handoff evaluation forms from phase one as well as the SBAR handoff form and handoff evaluation forms from phases two and three were paired based on patient stickers applied to the forms by the OR and PACU nurses. Once these forms were successfully paired, they were included in the sample for data collection. At this particular institution there were an average of 15-25 cases per day Monday through Friday, which lead to 75-125 cases per work week. While this project did not make use

of direct observation, the short duration and limitations of one researcher determined the factors of data collection.

The completed forms were be collected from the locked box located in the PACU every other scheduled surgical day. Forms were separated by date based on the patient sticker attached to each form. If a form was unable to be paired because one of the two forms were missing, it was shredded. It was hypothesized that several trends would emerge from the handoff evaluation forms and the SBAR handoff forms when comparing forms from phase one to phase three. It was hoped that items on the forms would be reported and that as nurses become practiced missed items would decrease.

All paper forms were coded by the project manager so that they corresponded with the data collection forms provided within the appendices. This included the SBAR handoff form, the handoff evaluation form, SAQ pretest and posttest, and the demographic data form. Each form was coded upon collection at the time of patient information removal. Once forms were paired together, the pair received a chronological number beginning with “1” and running numerically through all three phases until the end of the project. The second pair of forms received the number “2”, the third “3”, and so on.

Finally, the MIDAS report audit was not perfect for identifying risks to patient safety; however, it was the tool that this organization uses to report patient safety evens. It was also easily accessible and assessable means for the project leader to observe a change in patient safety.

Reliability and Validity of Data Measures

The SAQ had been used by various studies (UTHSCH, 2015) and measured six items with 36 Likert scale questions (UTHSCH, 2015). It was developed by the University of Texas at Houston and the project leader was granted permission to use the SAQ via electronic permission letter from the university (see Appendix C). While this tool was not considered common, it had been used to test perceptions of healthcare staff and the project leader used it as recommended by the developers (UTHSCH, 2015). The SAQ was considered reliable as it had been used successfully by other researchers and valid due to its consistent ability to measure what it was designed to (UTHSCH, 2015).

The demographic form that was filled out by the perioperative nurses had nine categories: age, race, gender, level of education, current employment status, years of practice, shift worked, length of shift, and department. This form was considered reliable, as many researchers have used self-reporting methods to gather demographic data (Greenberg et al., 2007; Joy et al., 2011; Manser et al., 2013; Nagpal et al., 2012; Petrovic et al., 2014). This form was considered valid as similar collection tools have successfully gathered demographic data (Greenberg et al., 2007; Joy et al., 2011; Manser et al., 2013; Nagpal et al., 2012; Petrovic et al., 2014).

As the SBAR handoff form and handoff evaluation form were self-reported measures, there were limitations to the reliability and validity of their data. The project leader was reliant on the perioperative nurses' ability to complete these measures in an honest fashion and return the completed forms to the proper location for collection. Both forms were created by the project leader (see Appendices A & B) based directly on

explicit recommendations from the AORN Handoff Toolkit (AORN, 2015) and the Joint Commission's National Patient Safety Guidelines (TJC, 2015) which added greatly to the reliability of both forms. The SBAR handoff form was formatted for OR nurses to fill in specific pieces of information and similar forms were widely used, adding to the validity of the form in this project (AORN, 2015; TJC, 2015). As the handoff evaluation form was in a checklist format, it could only measure the items listed and was considered valid (AORN, 2015; TJC, 2015).

The MIDAS report audit was dependent on nurses' reporting of near events and events involving patients. This was the only way the project leader can observe changes to patient safety related to the intervention of this project. The MIDAS reports were specifically limited by nurse judgment and willingness to report events or near events. Thus the measure was only as valid as the nurses completing the information and as reliable as the form's prefilled codes are specific to communication errors.

Finally, the project leader chose the three phase non-observation method in order to reduce the impact of a researcher on natural perioperative nurse behavior. By collecting forms and not directly observing handoff, the project leader gathered data that had not been effected by the project leader's presence during data collection. The goal of this design was to add to the ultimate reliability of all data collection measures.

Management and Analysis

All data was collected by the project leader from the locked box located in the PACU every few days. The forms were directly placed in an envelope for transportation out of the unit in order to remain confidential. Once forms were successfully paired, the patient information was removed and the forms were coded for inclusion.

All collected data was analyzed by the project leader and run through SPSS 22, a computer program, for statistical analysis. The project leader ran descriptive statistics and frequencies on the demographic data; an independent-samples *t* test and paired-samples *t* test were completed on the SAQ paired pretests and posttests; frequencies, mean scores, and an independent-samples *t* test on the SBAR handoff form; and frequencies, mean scores, independent-samples *t* test, paired-samples *t* test, and ANOVA testing were completed on the handoff evaluation items. These tests allowed the project leader to compare items reported during handoff by the OR nurses to those recorded by PACU nurses on average and for individual handoff. MIDAS reports were retrospectively audited for a six week period of time during the project implementation and analyzed with a t-test.

Protection of Human Subjects

Before beginning any data collection for this proposed EBP project, the project leader successfully applied for exempt status from the IRB boards of Valparaiso University and the Community Healthcare system. The project leader underwent the National Institutes of Health training and was certified to maintain ethical considerations throughout the project (see Appendix F). Once approval was acquired, the project leader contacted the Operating Department manager, who was in charge of the OR and PACU, and set up a calendar for the project on the unit.

The SBAR handoff form, handoff evaluation form, SAQ, and demographic form were anonymous to protect the perioperative nurses' privacy. These forms were collected from a locked box in the PACU. The SBAR handoff forms and handoff evaluation forms were labeled with a patient sticker in order to pair the forms from the

same handoff together. Once this pairing was accomplished the project leader removed the patient information from the forms in order to protect patient information.

Chapter 4

Findings

The goal of this EBP project was to standardize handoff communication between OR and PACU nurses in order to decrease risks to patient safety. In order to measure the effectiveness of the SBAR handoff sheet on standardizing handoff, the nurses who participated in the EBP project were asked to evaluate the handoff they participated in. OR nurses were asked to fill out the Handoff Evaluation form for two weeks and the SBAR Handoff form for weeks three through six. The PACU nurses were asked to fill out the Handoff Evaluation form for the entire six weeks of the project. These forms were evaluated for completeness and not content so that trends could be observed in item inclusion. The project manager chose to focus on frequency of handoff items as not all items would be appropriate to include in every patient handoff.

The perioperative nurses were also asked to provide their demographic data as well as to fill out the SAQ as a pretest and posttest. This questionnaire observed changes in nurse perception on the topics of teamwork, safety, job satisfaction, stress recognition, perception of management, and working conditions. Finally, an audit of MIDAS reports, the event report system at the organization, was run to determine any changes in the occurrence of patient safety events.

Participant Characteristics

Size.

At the time of this EBP project, there were a total of 15 OR nurses and 14 PACU nurses employed in surgical services. Due to low attendance to the monthly department meetings, 10 OR nurses and seven PACU nurses participated in filling out demographic

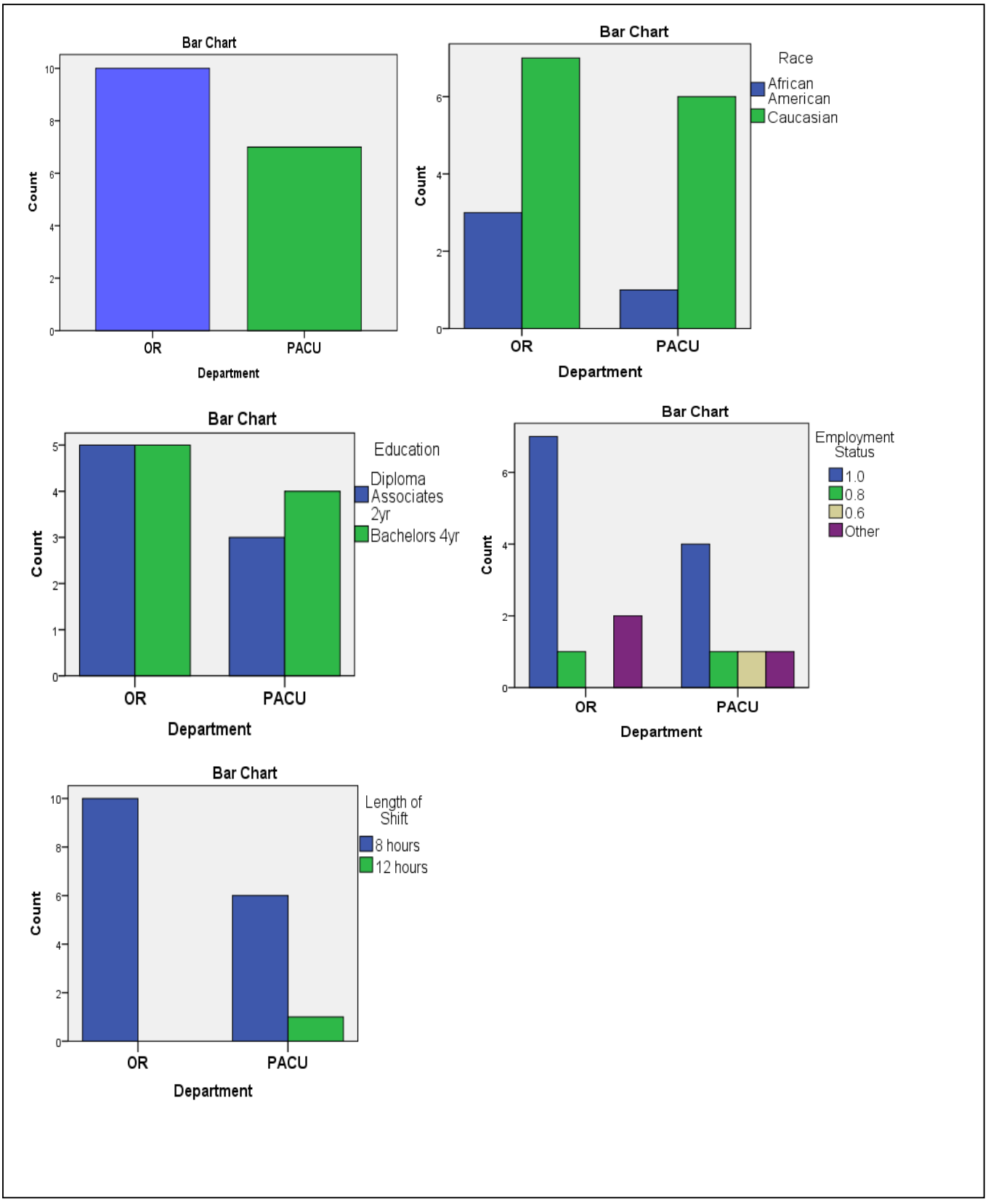
data. Participants were asked to fill out a pretest SAQ and posttest SAQ; however, few participants successfully returned both forms and resulted in a total of 12 (*N* = 12) participants.

Sample characteristics.

The demographic data collected underwent descriptive statistics and revealed the characteristics of the sample. There were a total of 17 (*N* = 17) participants who completed the demographic data form; however, only 12 participants completed both the pretest and posttest SAQ. All of these participants were female and reported being hired to the 7a-3p day shift, with 10 being OR nurses and seven being PACU nurses. Descriptive statistics showed that four nurses were African American and the remaining 13 were Caucasian. Eight of the nurses possessed a two year associates or diploma degree in nursing while nine had obtained a four year or bachelor's degree in nursing. Eleven of the nurses were employed as 1.0 status or full time, two were 0.8 status or 32hours biweekly, one nurse was a 0.6 status or 24 hours biweekly, and three remaining nurses reported other employment status. Finally, 16 nurses reported that their assigned shift was eight hours and one nurse reported being hired to a 12 hour shift (Figure 4.1).

The PACU nurses reported years of nursing experience with an average of 20.2 (*SD* = 15.02) and a range of 3–45 years of experience. In comparison, the OR nurses reported years of nursing experience with an average of 14.15 (*SD* = 10.35) and a range of 2.5–32 years of experience (see Table 4.1). On average, the PACU nurses were 45.8 (*SD* = 12.95) years old and ages ranged from 25-55 years old. By

Figure 4.1 *Perioperative Nurse Demographic Data*



comparison, the average OR nurse was age 42.9 (*SD* = 11.64) years old with a range from age 26-61 (see Table 4.2).

Table 4.1 *Perioperative Years of Practice*

	Department		
Years of Practice	OR	PACU	Total
2.5	1	0	1
3	1	1	2
6	1	0	1
7	0	1	1
9	1	0	1
10	1	1	2
15	2	0	2
19	1	1	2
27	0	1	1
30	1	0	1
31	0	1	1
32	1	0	1
45	0	1	1
Average	14.15	20.2	

Table 4.2 *Perioperative Age*

	Department		
Age	OR	PACU	Total
25	0	1	1
26	2	0	2
36	1	1	2
40	1	0	1
41	1	0	1
42	0	1	1
43	1	0	1
49	0	1	1
50	1	1	2
51	1	0	1
54	0	1	1
55	1	0	1
61	1	0	1
65	0	1	1
Average	42.9	45.8	

Attrition from this EBP project showed that three OR nurses and two PACU nurses failed to complete the posttest SAQ. These nurses were not working the days the project manager was available on the unit in order to provide the posttest SAQ to all participants.

Changes in Outcomes

Reliability.

It was necessary to test the reliability of the instruments used to collect data in this project and so Cronbach's alpha was used to evaluate the SAQ, Handoff Evaluation form, and SBAR Handoff form. Cronbach's alpha is a measure for internal consistency and determines the degree to which the items in the tools measured the same construct consistently.

Cronbach's alpha was performed on the SAQ and the overall reliability coefficient was 0.544. However, when the pretests and posttests were separated the reliability of the SAQ pretests was 0.892 and the reliability of the posttests was 0.498. This may have been related to perioperative nurses having already taken the SAQ as a pretest or variability related to using a self-report tool.

Cronbach's alpha was performed on the Handoff Evaluation form individually for the OR and the PACU and also on the departments together. The overall reliability coefficient for the Handoff Evaluation form in the OR during phase 1 was 0.849. The overall reliability coefficient for the PACU was 0.531. When the phases of the project were evaluated individually Cronbach's alpha in the PACU during phase 1 was 0.392, phase 2 was 0.832, and phase 3 2as 0.720. When looking at the OR and PACU together, the overall reliability of the Handoff Evaluation form was 0.683.

Cronbach's alpha was also performed on the SBAR Handoff form that was used by the OR nurses during weeks 3-6 of data collection. In phase 2 Cronbach's alpha was 0.816 and in phase 3 it was 0.703. Overall, the reliability coefficient for this form was 0.761.

Statistical Testing.

Descriptive statistics and frequencies were completed on the demographic data gathered from the OR and PACU nurses (*N* = 17). Independent and paired-sample t tests were calculated on the pairs of SAQ pretests and posttests (*N* = 12). Finally frequencies and independent-sample *t* tests were performed on the items from the SBAR handoff forms and handoff evaluation forms (*N* = 69). These tests were chosen to allow the project leader to compare items reported during handoff by the OR nurses to

those recorded by PACU nurses. MIDAS risk reports were retrospectively audited for a six week period of time prior to project implementation, compared to the six week timeframe during project implementation, and the data were assessed for differences.

Significance.

SAQ. This EBP project made use of the short SAQ form (see Appendix C), as recommended by the developers, and its use is specifically intended to measure medical staff perceptions of safety in the workplace. The SAQ is a 36 item, six category self-assessment questionnaire scored on a Likert scale which scores teamwork, safety climate, job satisfaction, stress recognition, perceptions of management, and working conditions (UTHSCH, 2015). Scores were assigned to each questionnaire by calculating the 100 point scale score for each of the six categories, as recommended by the scoring key, and scores could range from 0-100. First, the scores for items 2, 11, and 36 were reverse scored. A mean for each of the six categories was calculated based on the Likert scale values (1 = 5 points, 5 = 0 points), a value of one was subtracted and the result was multiplied by 25 (i.e. Teamwork Climate Scale Score for a Respondent = ((Mean of the teamwork items)-1) x 25) (UTHSCH, 2015). Using this form, items 14 and 33-36 are not part of the calculated scores as they are not part of the six recommended categories (UTHSCH, 2015).

The SAQ pretests were analyzed with an independent-sample *t* test, which revealed significant differences between the means of four items, and an additional four items approached significance. Significant items included Ask Questions, Good Job B, Problem Personnel B, and Timely Info B. The mean for the Ask Questions item on the SAQ pretest in the OR (M = 2.70, SD = 1.16) was significantly lower than the PACU (M

= 3.86, *SD* = 1.07), (*t*(15) = -2.14, *p* = 0.050).The mean for the Good Job B item on the SAQ pretest in the OR (*M* = 2.20, *SD* = 1.87) was significantly lower than the PACU (*M* = 4.29, *SD* = 0.95), (*t*(15) = -2.69, *p* = 0.017). The mean for the Problem Personnel B item on the SAQ pretest in the OR (*M* = 1.20, *SD* = 1.03) was significantly lower than the PACU (*M* = 3.57, *SD* = 0.79), (*t*(15) = -5.11, *p* = 0.000). The mean for the Timely Info B item on the SAQ pretest in the OR (*M* = 2.0, *SD* = 1.69) was significantly lower than the PACU (*M* = 4.0, *SD* = 0.82), (*t*(15) = -2.87, *p* = 0.012) (see Table 4.3). Significantly lower means on the posttest indicated that perioperative nurses felt these items scored lower than when they filled out the pretest.

The items which approached significance included Disagreement, Feedback, Supervised, and Working Conditions. The mean for the Disagreement item on the SAQ pretest in the OR (*M* = 2.7, *SD* = 1.6) was compared to the PACU (*M* = 3.86, *SD* = 1.07), (*t*(15) = -2.09, *p* = 0.054). The mean for the Feedback item on the SAQ pretest in the OR (*M* = 3.90, *SD* = 1.10) was compared to the PACU (*M* = 4.71, *SD* = 0.49), (*t*(15) = -1.82, *p* = 0.088). The mean for the Supervised item on the SAQ pretest in the OR (*M* = 3.1, *SD* = 1.19) was compared to the PACU (*M* = 4.14, *SD* = 0.69), (*t*(15) = -2.07, *p* = 0.057). The mean for the Working Conditions item on the SAQ pretest in the OR (*M* = 54.15, *SD* = 24.29) was compared to the PACU (*M* = 73.79, *SD* = 14.78), (*t*(15) = -1.89, *p* = 0.77) (see Table 4.3). All means in the OR were lower when compared to the PACU, indicating that PACU nurses have more positive perceptions of these items than OR nurses.

The SAQ posttests were analyzed with an independent-sample *t* test and revealed significant differences between the OR and PACU for eight items including:

Table 4.3 SAQ Pretest Independent-Samples t Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Nurse Input	Equal variances assumed	.457	.509	-.361	15	.723	-.12857	.35569	-.88671	.62957
	Equal variances not assumed			-.390	14.964	.702	-.12857	.32954	-.83111	.57397
Speak Up	Equal variances assumed	.737	.404	.632	15	.537	.37143	.58744	-.88068	1.62353
	Equal variances not assumed			.598	10.448	.562	.37143	.62095	-1.00413	1.74699
Disagreement	Equal variances assumed	.095	.763	-2.089	15	.054	-1.15714	.55401	-2.33798	.02370
	Equal variances not assumed			-2.121	13.739	.053	-1.15714	.54563	-2.32949	.01520
Support	Equal variances assumed	2.140	.164	-1.023	15	.322	-.31429	.30719	-.96905	.34048
	Equal variances not assumed			-1.092	14.993	.292	-.31429	.28793	-.92801	.29944
Ask Questions	Equal variances assumed	6.474	.022	-2.136	15	.050	-.75714	.35439	-1.51251	-.00178
	Equal variances not assumed			-2.430	13.043	.030	-.75714	.31157	-1.43002	-.08427
Team	Equal variances assumed	1.635	.220	-1.312	15	.209	-.57143	.43550	-1.49967	.35682
	Equal variances not assumed			-1.466	13.994	.165	-.57143	.38978	-1.40745	.26460
Feel Safe	Equal variances assumed	4.879	.043	-1.375	15	.189	-.61429	.44677	-1.56656	.33799
	Equal variances not assumed			-1.560	13.203	.142	-.61429	.39386	-1.46384	.23527
Medical Errors	Equal variances assumed	2.791	.116	.401	15	.694	.28571	.71333	-1.23472	1.80615
	Equal variances not assumed			.362	8.625	.726	.28571	.78824	-1.50928	2.08071
Proper Channels	Equal variances assumed	1.253	.281	.230	15	.822	.15714	.68471	-1.30229	1.61657
	Equal variances not assumed			.205	8.192	.842	.15714	.76590	-1.60182	1.91611
Feedback	Equal variances assumed	5.997	.027	-1.823	15	.088	-.81429	.44677	-1.76656	.13799
	Equal variances not assumed			-2.067	13.203	.059	-.81429	.39386	-1.66384	.03527
Discuss Errors	Equal variances assumed	.468	.504	-.246	15	.809	-.14286	.58111	-1.38146	1.09575
	Equal variances not assumed			-.253	14.254	.804	-.14286	.56464	-1.35187	1.06616
Safety Concerns	Equal variances assumed	.278	.606	.072	15	.943	.04286	.59351	-1.22219	1.30790
	Equal variances not assumed			.067	9.819	.948	.04286	.63641	-1.37868	1.46440
Culture	Equal variances assumed	.000	.996	.020	15	.984	.01429	.71447	-1.50856	1.53714
	Equal variances not assumed			.020	13.726	.984	.01429	.70388	-1.49821	1.52678
Suggestions	Equal variances assumed	.291	.597	-1.543	15	.144	-.95714	.62019	-2.27905	.36477
	Equal variances not assumed			-1.677	14.875	.114	-.95714	.57065	-2.17435	.26007

(Table 4.3 SAQ Pretest Independent-Samples t Test Cont.)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
I Like My Job	Equal variances assumed	.072	.793	.079	15	.938	.02857	.36246	-.74398	.80113
	Equal variances not assumed			.077	12.019	.940	.02857	.37057	-.77870	.83584
Family	Equal variances assumed	3.589	.078	.404	15	.692	.27143	.67106	-1.15891	1.70177
	Equal variances not assumed			.425	14.837	.677	.27143	.63797	-1.08967	1.63253
Good Place	Equal variances assumed	1.315	.270	-.969	15	.348	-.47143	.48643	-1.50823	.56537
	Equal variances not assumed			-1.030	14.970	.319	-.47143	.45776	-1.44730	.50444
Proud To Work	Equal variances assumed	.339	.569	-.492	15	.630	-.22857	.46429	-1.21818	.76104
	Equal variances not assumed			-.517	14.825	.612	-.22857	.44170	-1.17101	.71387
Morale	Equal variances assumed	.707	.414	-.966	15	.349	-.64286	.66553	-2.06139	.77568
	Equal variances not assumed			-.916	10.552	.380	-.64286	.70188	-2.19572	.91000
Impaired	Equal variances assumed	.000	.998	.747	15	.467	.47143	.63128	-.87412	1.81697
	Equal variances not assumed			.748	13.166	.467	.47143	.62996	-.88777	1.83063
Fatigued	Equal variances assumed	1.037	.325	-1.357	15	.195	-.72857	.53705	-1.87326	.41612
	Equal variances not assumed			-1.472	14.905	.162	-.72857	.49508	-1.78439	.32725
Hostile Situations	Equal variances assumed	.973	.340	.080	15	.937	.04286	.53619	-1.10000	1.18571
	Equal variances not assumed			.077	11.291	.940	.04286	.55657	-1.17831	1.26402
Emergency Situations	Equal variances assumed	.678	.423	.069	15	.946	.05714	.82910	-1.71003	1.82432
	Equal variances not assumed			.068	12.266	.947	.05714	.84333	-1.77590	1.89019
Daily Efforts A	Equal variances assumed	.018	.896	-.239	15	.814	-.12857	.53705	-1.27326	1.01612
	Equal variances not assumed			-.247	14.365	.808	-.12857	.52010	-1.24141	.98427
Compromise Patient Safety A	Equal variances assumed	5.132	.039	.543	15	.595	.32857	.60509	-.96115	1.61829
	Equal variances not assumed			.489	8.474	.637	.32857	.67143	-1.20481	1.86195
Good Job A	Equal variances assumed	.003	.955	-.375	15	.713	-.20000	.53381	-1.33779	.93779
	Equal variances not assumed			-.367	12.077	.720	-.20000	.54511	-1.38685	.98685
Problem Personnel A	Equal variances assumed	3.401	.085	.024	15	.981	.01429	.59039	-1.24410	1.27267
	Equal variances not assumed			.027	14.264	.979	.01429	.53174	-1.12420	1.15277
Timely Info A	Equal variances assumed	.026	.874	.505	15	.621	.27143	.53705	-.87326	1.41612
	Equal variances not assumed			.499	12.469	.626	.27143	.54396	-.90884	1.45170

(Table 4.3 SAQ Pretest Independent-Samples t Test Cont.)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Daily Efforts B	Equal variances assumed	5.648	.031	-2.849	15	.012	-2.04286	.71705	-3.57122	-.51450
	Equal variances not assumed			-3.173	14.137	.007	-2.04286	.64384	-3.42251	-.66321
Compromise Patient Safety B	Equal variances assumed	2.162	.162	-.854	15	.406	-.82857	.97000	-2.89608	1.23893
	Equal variances not assumed			-.888	14.567	.389	-.82857	.93309	-2.82256	1.16542
Good Job B	Equal variances assumed	5.608	.032	-2.694	15	.017	-2.08571	.77428	-3.73605	-.43537
	Equal variances not assumed			-3.009	14.000	.009	-2.08571	.69308	-3.57223	-.59920
Problem Personnel B	Equal variances assumed	.882	.363	-5.108	15	.000	-2.37143	.46429	-3.36104	-1.38182
	Equal variances not assumed			-5.369	14.825	.000	-2.37143	.44170	-3.31387	-1.42899
Timely Info B	Equal variances assumed	5.226	.037	-2.870	15	.012	-2.00000	.69693	-3.48548	-.51452
	Equal variances not assumed			-3.227	13.682	.006	-2.00000	.61978	-3.33220	-.66780
Level of Staffing	Equal variances assumed	3.336	.088	.000	15	1.000	.00000	.62335	-1.32865	1.32865
	Equal variances not assumed			.000	14.400	1.000	.00000	.56344	-1.20531	1.20531
Training	Equal variances assumed	7.859	.013	-1.300	15	.213	-.85714	.65942	-2.26266	.54837
	Equal variances not assumed			-1.428	14.621	.174	-.85714	.60008	-2.13906	.42478
Information Available	Equal variances assumed	.526	.480	-1.006	15	.331	-.55714	.55401	-1.73798	.62370
	Equal variances not assumed			-1.068	14.962	.303	-.55714	.52184	-1.66966	.55537
Supervised	Equal variances assumed	2.036	.174	-2.065	15	.057	-1.04286	.50509	-2.11943	.03372
	Equal variances not assumed			-2.268	14.628	.039	-1.04286	.45974	-2.02495	-.06077
Nurse Collaboration	Equal variances assumed	.008	.929	.000	15	1.000	.00000	.44078	-.93950	.93950
	Equal variances not assumed			.000	11.270	1.000	.00000	.45774	-1.00453	1.00453
Physician Collaboration	Equal variances assumed	.011	.917	-.975	15	.345	-.40000	.41034	-1.27462	.47462
	Equal variances not assumed			-.913	10.027	.382	-.40000	.43789	-1.37533	.57533
Pharmacist Collaboration	Equal variances assumed	1.890	.189	-.996	15	.335	-.60000	.60222	-1.88360	.68360
	Equal variances not assumed			-1.052	14.903	.309	-.60000	.57016	-1.81595	.61595
Communication Breakdowns	Equal variances assumed	1.178	.295	-.344	15	.735	-.21429	.62243	-1.54096	1.11239
	Equal variances not assumed			-.324	10.266	.752	-.21429	.66060	-1.68104	1.25247
Teamwork Climate	Equal variances assumed	.020	.888	-.843	15	.413	-6.36457	7.55140	-22.46001	9.73086
	Equal variances not assumed			-.829	12.295	.423	-6.36457	7.67636	-23.04552	10.31638

(Table 4.3 SAQ Pretest Independent-Samples t Test Cont.)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Safety Climate	Equal variances assumed	.189	.670	-.599	15	.558	-4.70414	7.84924	-21.43441	12.02613
	Equal variances not assumed			-.573	10.919	.578	-4.70414	8.21227	-22.79552	13.38724
Job Satisfaction	Equal variances assumed	.244	.628	-.594	15	.561	-6.64286	11.17655	-30.46511	17.17940
	Equal variances not assumed			-.591	12.820	.565	-6.64286	11.23701	-30.95373	17.66802
Stress Recognition	Equal variances assumed	.359	.558	.211	15	.836	2.61571	12.41402	-23.84414	29.07557
	Equal variances not assumed			.205	11.732	.841	2.61571	12.76779	-25.27354	30.50497
Perceptions of Management	Equal variances assumed	.529	.478	-1.101	15	.288	-9.91257	9.00621	-29.10884	9.28370
	Equal variances not assumed			-1.089	12.572	.297	-9.91257	9.10236	-29.64526	9.82012
Working Conditions	Equal variances assumed	1.995	.178	-1.898	15	.077	-19.64929	10.35450	-41.71938	2.42080
	Equal variances not assumed			-2.069	14.820	.056	-19.64929	9.49882	-39.91702	.61845

Family, Daily Efforts B, Compromise Patient Safety B, Good Job B, Problem Personnel B, Timely Info B, Level of Staffing, and Communication Breakdowns. The mean for the Family item on the SAQ posttest in the OR (M = 4.43, SD = 0.79) was significantly higher than the PACU (M = 3.00, SD = 0.71), (t(10) = 3.227, p = 0.009). The mean for the Daily Efforts B item on the SAQ posttest in the OR (M = 2.86, SD = 1.46) was significantly higher than the PACU (M = 0.00, SD = 0.00), (t(10) = 4.03, p = 0.002). The mean for the Compromise Patient Safety B item on the SAQ posttest in the OR (M = 3.57, SD = 1.81) was significantly higher than the PACU (M = 0.000, SD = 0.000), (t(10) = 4.34, p = 0.001). The mean for the Good Job B item on the SAQ posttest in the OR (M = 3.29, SD = 1.70) was significantly higher than the PACU (M = 0.00, SD = 0.000), (t(10) = 4.25, p = 0.002). The mean for the Problem Personnel B item on the SAQ posttest in OR (M = 2.00, SD = 1.63) was significantly higher than the PACU (M = 0.00, SD = 0.00), (t(10) = 2.70, p = 0.022). The mean for the Timely Info B item on the SAQ posttest in the OR (M = 3.00, SD = 1.53) was significantly higher than the PACU (M = 0.00, SD = 0.00), (t(10) = 4.33, p = 0.001). The mean for the Level of Staffing item on the SAQ posttest in the OR (M = 3.14, SD = 1.07) was significantly higher than the PACU (M = 1.60, SD = 0.89), (t(10) = 2.63, p = 0.025). The mean for the Communication Breakdowns item on the SAQ posttest in the OR (M = 2.71, SD = 0.76) was significantly higher than the PACU (M = 1.40, SD = 1.14), (t(10) = 2.42, p = 0.036) (see Table 4.4). All eight items were scored higher by perioperative nurses in the OR when compared to the PACU, indicating that OR nurses felt more positively about these posttest items than PACU nurses.

Table 4.4 SAQ Posttest Independent-Samples t Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Nurse Input	Equal variances assumed	.980	.345	.578	10	.576	.31429	.54391	-.89762	1.52619
	Equal variances not assumed			.538	6.480	.609	.31429	.58449	-1.09062	1.71919
Speak Up	Equal variances assumed	2.821	.124	.711	10	.493	.45714	.64295	-.97544	1.88973
	Equal variances not assumed			.629	5.195	.556	.45714	.72665	-1.38991	2.30419
Disagreement	Equal variances assumed	.730	.413	-.310	10	.763	-.17143	.55284	-1.40323	1.06038
	Equal variances not assumed			-.290	6.669	.780	-.17143	.59028	-1.58138	1.23852
Support	Equal variances assumed	5.883	.036	.364	10	.723	.20000	.54929	-1.02388	1.42388
	Equal variances not assumed			.321	5.132	.761	.20000	.62259	-1.38814	1.78814
Ask Questions	Equal variances assumed	3.288	.100	.655	10	.527	.54286	.82926	-1.30485	2.39057
	Equal variances not assumed			.564	4.638	.599	.54286	.96334	-1.99268	3.07840
Team	Equal variances assumed	.866	.374	-1.191	10	.261	-.54286	.45571	-1.55825	.47253
	Equal variances not assumed			-1.137	7.251	.292	-.54286	.47752	-1.66415	.57844
Feel Safe	Equal variances assumed	1.807	.209	-.581	10	.574	-.22857	.39342	-1.10516	.64801
	Equal variances not assumed			-.638	9.684	.538	-.22857	.35838	-1.03064	.57350
Medical Errors	Equal variances assumed	.004	.952	-1.033	10	.326	-.54286	.52559	-1.71394	.62823
	Equal variances not assumed			-1.034	8.805	.329	-.54286	.52502	-1.73455	.64884
Proper Channels	Equal variances assumed	2.280	.162	-1.351	10	.207	-.51429	.38076	-1.36268	.33410
	Equal variances not assumed			-1.475	9.793	.172	-.51429	.34876	-1.29360	.26502
Feedback	Equal variances assumed	2.361	.155	.327	10	.751	.25714	.78683	-1.49602	2.01031
	Equal variances not assumed			.342	9.856	.740	.25714	.75241	-1.42267	1.93695
Discuss Errors	Equal variances assumed	1.379	.268	.556	10	.590	.48571	.87300	-1.45944	2.43087
	Equal variances not assumed			.507	5.915	.630	.48571	.95753	-1.86544	2.83687
Safety Concerns	Equal variances assumed	.004	.953	.595	10	.565	.40000	.67273	-1.09895	1.89895
	Equal variances not assumed			.596	8.843	.566	.40000	.67118	-1.12241	1.92241
Culture	Equal variances assumed	.303	.594	-.040	10	.969	-.02857	.71509	-1.62188	1.56474
	Equal variances not assumed			-.041	9.350	.968	-.02857	.70092	-1.60518	1.54804
Suggestions	Equal variances assumed	.005	.945	-.234	10	.820	-.14286	.61012	-1.50229	1.21657
	Equal variances not assumed			-.237	9.137	.818	-.14286	.60271	-1.50318	1.21747

(Table 4.4 SAQ Posttest Independent-Samples t Test Cont.)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
I Like My Job	Equal variances assumed	18.519	.002	-1.291	10	.226	-.28571	.22131	-.77883	.20740
	Equal variances not assumed			-1.549	6.000	.172	-.28571	.18443	-.73699	.16556
Family	Equal variances assumed	.968	.348	3.227	10	.009	1.42857	.44263	.44234	2.41481
	Equal variances not assumed			3.291	9.336	.009	1.42857	.43409	.45194	2.40520
Good Place	Equal variances assumed	1.124	.314	-.418	10	.685	-.17143	.41048	-1.08602	.74317
	Equal variances not assumed			-.445	9.999	.666	-.17143	.38527	-1.02988	.68702
Proud To Work	Equal variances assumed	.485	.502	.381	10	.711	.11429	.30020	-.55461	.78318
	Equal variances not assumed			.373	8.088	.719	.11429	.30662	-.59144	.82001
Morale	Equal variances assumed	1.081	.323	.782	10	.452	.54286	.69423	-1.00399	2.08970
	Equal variances not assumed			.715	6.011	.501	.54286	.75871	-1.31284	2.39856
Impaired	Equal variances assumed	1.507	.248	.645	10	.533	.60000	.92952	-1.47109	2.67109
	Equal variances not assumed			.585	5.779	.580	.60000	1.02493	-1.93133	3.13133
Fatigued	Equal variances assumed	2.160	.172	.381	10	.711	.34286	.90061	-1.66383	2.34955
	Equal variances not assumed			.334	4.994	.752	.34286	1.02745	-2.29917	2.98489
Hostile Situation	Equal variances assumed	.001	.977	-.456	10	.658	-.42857	.93895	-2.52069	1.66355
	Equal variances not assumed			-.473	9.696	.647	-.42857	.90651	-2.45703	1.59989
Emergency Situations	Equal variances assumed	.004	.950	.494	10	.632	.37143	.75247	-1.30517	2.04803
	Equal variances not assumed			.491	8.631	.635	.37143	.75584	-1.34962	2.09248
Daily Efforts A	Equal variances assumed	.024	.880	.135	10	.896	.14286	1.06138	-2.22205	2.50776
	Equal variances not assumed			.133	8.457	.897	.14286	1.07190	-2.30589	2.59160
Compromise Patient Safety A	Equal variances assumed	.061	.810	.461	10	.654	.51429	1.11451	-1.96899	2.99756
	Equal variances not assumed			.451	8.001	.664	.51429	1.14131	-2.11752	3.14609
Good Job A	Equal variances assumed	.007	.933	.805	10	.440	.82857	1.02952	-1.46535	3.12249
	Equal variances not assumed			.797	8.446	.447	.82857	1.04008	-1.54798	3.20512
Problem Personnel A	Equal variances assumed	.002	.968	.245	10	.811	.25714	1.04838	-2.07879	2.59308
	Equal variances not assumed			.244	8.631	.813	.25714	1.05308	-2.14073	2.65501
Timely Info A	Equal variances assumed	.638	.443	1.702	10	.120	1.48571	.87300	-.45944	3.43087
	Equal variances not assumed			1.836	9.953	.096	1.48571	.80930	-.31867	3.29009

(Table 4.4 SAQ Posttest Independent-Samples t Test Cont.)

		Levene's Test for Equality of Variances		t -test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Daily Efforts B	Equal variances assumed	2.372	.155	4.303	10	.002	2.85714	.66394	1.37779	4.33649
	Equal variances not assumed			5.164	6.000	.002	2.85714	.55328	1.50331	4.21098
Compromise Patient Safety B	Equal variances assumed	7.544	.021	4.344	10	.001	3.57143	.82214	1.73958	5.40328
	Equal variances not assumed			5.213	6.000	.002	3.57143	.68512	1.89500	5.24785
Good Job B	Equal variances assumed	5.362	.043	4.251	10	.002	3.28571	.77301	1.56333	5.00810
	Equal variances not assumed			5.101	6.000	.002	3.28571	.64418	1.70947	4.86196
Problem Personnel B	Equal variances assumed	5.556	.040	2.700	10	.022	2.00000	.74066	.34972	3.65028
	Equal variances not assumed			3.240	6.000	.018	2.00000	.61721	.48973	3.51027
Timely Info B	Equal variances assumed	2.419	.151	4.330	10	.001	3.00000	.69282	1.45630	4.54370
	Equal variances not assumed			5.196	6.000	.002	3.00000	.57735	1.58727	4.41273
Level of Staffing	Equal variances assumed	.141	.715	2.627	10	.025	1.54286	.58721	.23447	2.85124
	Equal variances not assumed			2.714	9.638	.022	1.54286	.56856	.26954	2.81618
Training	Equal variances assumed	2.316	.159	-.264	10	.797	-.20000	.75895	-1.89104	1.49104
	Equal variances not assumed			-.233	5.202	.824	-.20000	.85746	-2.37864	1.97864
Information Available	Equal variances assumed	1.739	.217	1.546	10	.153	1.02857	.66541	-.45406	2.51121
	Equal variances not assumed			1.389	5.549	.218	1.02857	.74056	-.81982	2.87696
Supervised	Equal variances assumed	1.798	.210	.393	10	.703	.28571	.72731	-1.33483	1.90626
	Equal variances not assumed			.346	5.100	.743	.28571	.82561	-1.82418	2.39561
Nurse Collaboration	Equal variances assumed	4.215	.067	.662	10	.523	.57143	.86284	-1.35109	2.49395
	Equal variances not assumed			.591	5.373	.579	.57143	.96750	-1.86461	3.00747
Physician Collaboration	Equal variances assumed	3.288	.100	.310	10	.763	.25714	.82926	-1.59057	2.10485
	Equal variances not assumed			.267	4.638	.801	.25714	.96334	-2.27840	2.79268
Pharmacist Collaboration	Equal variances assumed	4.545	.059	.115	10	.911	.08571	.74593	-1.57632	1.74774
	Equal variances not assumed			.097	4.370	.927	.08571	.87978	-2.27750	2.44893
Communication Breakdowns	Equal variances assumed	.980	.345	2.416	10	.036	1.31429	.54391	.10238	2.52619
	Equal variances not assumed			2.249	6.480	.062	1.31429	.58449	-.09062	2.71919
Teamwork Climate	Equal variances assumed	2.369	.155	.240	10	.815	2.73600	11.37860	-22.61711	28.08911
	Equal variances not assumed			.215	5.419	.838	2.73600	12.73346	-29.25000	34.72200

(Table 4.4 SAQ Posttest Independent-Samples t Test Cont.)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Safety Climate	Equal variances assumed	.010	.924	-.188	10	.854	-1.63371	8.67391	-20.96040	17.69297
	Equal variances not assumed			-.180	7.360	.862	-1.63371	9.05818	-22.84254	19.57511
Job Satisfaction	Equal variances assumed	.208	.658	1.095	10	.299	8.14286	7.43626	-8.42616	24.71188
	Equal variances not assumed			1.041	7.128	.332	8.14286	7.82222	-10.28641	26.57212
Stress Recognition	Equal variances assumed	.013	.912	.247	10	.810	3.32143	13.46356	-26.67724	33.32010
	Equal variances not assumed			.250	9.156	.808	3.32143	13.29123	-26.66749	33.31035
Perceptions of Management	Equal variances assumed	2.317	.159	3.151	10	.010	39.54029	12.54902	11.57932	67.50125
	Equal variances not assumed			3.617	8.096	.007	39.54029	10.93299	14.38082	64.69975
Working Climate	Equal variances assumed	1.559	.240	.545	10	.598	7.13886	13.10519	-22.06132	36.33904
	Equal variances not assumed			.487	5.407	.646	7.13886	14.67274	-29.73956	44.01728

The matched SAQ pretest and posttest pairs for all perioperative nurses were analyzed with a paired-samples *t* test. Only one of the 36 variables included in the form showed statistical significance when compared. A paired-samples *t* test was calculated to compare the mean pretest Support score to the mean posttest Support score. The mean on the pretest (*M* = 4.58, *SD* = 0.67) was significantly higher than the mean on the posttest (*M* = 3.92, *SD* = 0.90), (*t*(11) = 2.60, *p* = 0.025), indicating this was the only item which perioperative nurses scored differently from pretest to posttest. Only one other item from the SAQ approached significance. The Suggestions item mean on the pretest score (*M* = 3.00, *SD* = 1.35) was compared to the mean on the posttest score (*M* = 3.92, *SD* = 0.99), (*t*(11) = -2.11, *p* = 0.059), indicating that perioperative nurses scored this item higher on the pretest than they did on the posttest (see Table 4.5).

Handoff Evaluation Form.

For the first two weeks of the EBP project, the OR nurses and the PACU nurses used the Handoff Evaluation Form to evaluate OR to PACU nurse handoff and forms were matched by patient. Then for weeks three through six, the PACU nurses continued to use the Handoff Evaluation form while the OR nurses used the SBAR Handoff form, with forms being matched again by patient. The 42 pairs of forms from the first two weeks, or phase one, were statistically analyzed using the paired-samples *t* test to compare the 24 items. A total score for each form was also calculated, with one point being awarded for ‘Yes’ or ‘No’ answers and no points for answers that were ‘Not Indicated’ (NI). The mean was calculated for each phase and in each department with phase one in the OR (*M* = 8.87, *SD* = 4.15). The PACU Handoff Evaluation forms showed that phase one (*M* = 8.14, *SD* = 3.2), phase two (*M* = 8.31,

Table 4.5 *SAQ Pretest Posttest Paired-Samples t Test Results*

Handoff Item		Pre-test Mean	Post-test Mean	Paired Differences					t	df	Sig. (2-tailed)
				Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
							Lower	Upper			
Pair 1	Pre Nurse Input – Post Nurse Input	3.3333	3.5833	-.25000	1.05529	.30464	-.92050	.42050	-.821	11	.429
Pair 2	Pre Speak Up – Post Speak Up	3.7500	3.6667	.08333	1.78164	.51432	-1.04867	1.21533	.162	11	.874
Pair 3	Pre Disagreement – Post Disagreement	3.0000	3.5000	-.50000	1.38170	.39886	-1.37789	.37789	-1.254	11	.236
Pair 4	Pre Support – Post Support	4.5833	3.9167	.66667	.88763	.25624	.10270	1.23064	2.602	11	.025
Pair 5	Pre Ask Questions – Post Ask Questions	4.2500	3.9167	.33333	1.61433	.46602	-.69236	1.35903	.715	11	.489
Pair 6	Pre Team – Post Team	4.2500	4.0833	.16667	1.26730	.36584	-.63854	.97187	.456	11	.658
Pair 7	Pre Feel Safe – Post Feel Safe	4.2500	4.6667	-.41667	.90034	.25990	-.98871	.15538	-1.603	11	.137
Pair 8	Pre Medical Errors – Post Medical Errors	3.500	4.0833	-.58333	1.56428	.45157	-1.57723	.41056	-1.292	11	.223
Pair 9	Pre Proper Channels – Post Proper Channels	3.9167	4.5000	-.58333	1.67649	.48396	-1.64852	.48186	-1.205	11	.253
Pair 10	Pre Feedback – Post Feedback	4.0833	3.7500	.33333	1.72328	.49747	-.76159	1.42825	.670	11	.517
Pair 11	Pre Discuss Errors – Post Discuss Errors	2.9167	3.0833	-.16667	1.85047	.53418	-1.34240	1.00907	-.312	11	.761
Pair 12	Pre Safety Concerns – Post Safety Concerns	4.0000	3.8333	.16667	1.40346	.40514	-.72505	1.05838	.411	11	.689
Pair 13	Pre Culture – Post Culture	3.1667	3.5833	-.41667	2.06522	.59618	-1.72885	.89551	-.699	11	.499
Pair 14	Pre Suggestions – Post Suggestions	3.0000	3.9167	-.91667	1.50504	.43447	-1.87292	.03959	-2.110	11	.059
Pair 15	Pre I Like My Job – Post I Like My Job	4.5833	4.8333	-.25000	.96531	.27866	-.86333	.36333	-.897	11	.389
Pair 16	Pre Family – Post Family	3.5833	3.8333	-.25000	1.54479	.44594	-1.23151	.73151	-.561	11	.586
Pair 17	Pre Good Place – Post Good Place	4.2500	4.5000	-.25000	1.05529	.30464	-.92050	.42050	-.821	11	.429
Pair 18	Pre Proud To Work – Post Proud To Work	4.1667	4.6667	-.50000	1.16775	.33710	-1.24195	.24195	-1.483	11	.166
Pair 19	Pre Morale – Post Morale	2.8333	2.9167	-.08333	1.97523	.57020	-1.33833	1.17166	-.146	11	.886
Pair 20	Pre Impaired – Post Impaired	3.5000	3.7500	-.25000	2.41680	.69767	-1.78556	1.28556	-.358	11	.727
Pair 21	Pre Fatigued – Post Fatigued	3.8333	4.0000	-.16667	2.16725	.62563	-1.54367	1.21034	-.266	11	.795
Pair 22	Pre Hostile Situations – Post Hostile Situation	3.9167	3.7500	.16667	1.89896	.54818	-1.03988	1.37321	.304	11	.767
Pair 23	Pre Emergency Situations – Post Emergency Situations	2.7500	3.4167	-.66667	2.01509	.58171	-1.94700	.61366	-1.146	11	.276

(Table 4.5 *SAQ Pretest Posttest Paired-Samples t Test Results Cont.)*

Handoff Item		Pre-test Mean	Post-test Mean	Paired Differences					t	df	Sig. (2-tailed)
				Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
							Lower	Upper			
Pair 24	Pre Daily Efforts A – Post Daily Efforts A	3.1667	3.0833	.08333	2.27470	.65665	-1.36194	1.52861	.127	11	.901
Pair 25	Pre Compromise Patient Safety A – Post Compromise Patient Safety A	3.5000	3.5000	.00000	2.44949	.70711	-1.55633	1.55633	.000	11	1.000
Pair 26	Pre Good Job A – Post Good Job A	3.6667	3.0833	.58333	2.35327	.67933	-.91186	2.07853	.859	11	.409
Pair 27	Pre Problem Personnel A – Post Problem Personnel A	3.2500	2.7500	.50000	2.02260	.58387	-.78510	1.78510	.856	11	.410
Pair 28	Pre Timely Info A – Post Timely Info A	3.4167	2.6667	.75000	1.60255	.46262	-.26821	1.76821	1.621	11	.133
Pair 29	Pre Daily Efforts B – Post Daily Efforts B	2.9167	1.6667	1.25000	2.76751	.79891	-.50839	3.00839	1.565	11	.146
Pair 30	Pre Compromise Patient Safety B – Post Compromise Patient Safety B	2.7500	2.0833	.66667	2.46183	.71067	-.89751	2.23084	.938	11	.368
Pair 31	Pre Good Job B – Post Good Job B	2.8333	1.9167	.91667	3.05877	.88299	-1.02678	2.86012	1.038	11	.321
Pair 32	Pre Problem Personnel B – Post Problem Personnel B	3.2500	1.1667	.83333	2.62274	.75712	-.83308	2.49975	1.101	11	.295
Pair 33	Pre Timely Info B – Post Timely Info B	2.7500	1.7500	1.00000	2.82843	.81650	-.79710	2.79710	1.225	11	.246
Pair 34	Pre Level of Staffing – Post Level of Staffing	2.8333	2.5000	.33333	1.43548	.41439	-.57873	1.24539	.804	11	.438
Pair 35	Pre Training – Post Training	3.25000	3.0833	.16667	1.46680	.42343	-.76530	1.09863	.394	11	.701
Pair 36	Pre Information Available – Post Information Available	3.5000	3.0000	.50000	1.44600	.41742	-.41874	1.41874	1.198	11	.256
Pair 37	Pre Supervised – Post Supervised	3.3333	3.1667	.16667	1.64225	.47408	-.87677	1.21010	.352	11	.732
Pair 38	Pre Nurse Collaboration – Post Nurse Collaboration	3.9167	3.3333	.58333	1.37895	.39807	-.29281	1.45948	1.465	11	.171
Pair 39	Pre Physician Collaboration – Post Physician Collaboration	3.7500	3.7500	.00000	1.41421	.40825	-.89855	.89855	.000	11	1.000
Pair 40	Pre Pharmacist Collaboration – Post Pharmacist Collaboration	3.5833	3.2500	.33333	1.07309	.30977	-.34847	1.01514	1.076	11	.305
Pair 41	Pre Communication Breakdowns- Post Communication Breakdowns	2.7500	2.1667	.58333	1.31137	.37856	-.24987	1.41654	1.541	11	.152
Pair 42	Pre Teamwork Climate – Post Teamwork Climate	65.9483	64.9200	1.02833	29.36157	8.47596	-17.62712	19.68379	.121	11	.906
Pair 43	Pre Safety Climate – Post Safety Climate	70.8075	72.6150	-1.80750	22.35033	6.45198	-16.00822	12.39322	-.280	11	.785
Pair 43	Pre Job Satisfaction – Post Job Satisfaction	72.9167	78.7500	-5.83333	28.59063	8.25340	-23.99895	12.33229	-.707	11	.494
Pair 45	Pre Stress Recognition – Post Stress Recognition	64.2333	70.9375	-6.70417	36.89571	10.65087	-30.14658	16.73825	-.629	11	.542
Pair 46	Pre Perceptions of Management – Post Perceptions of Management	51.0458	35.7892	15.25667	31.82922	9.18831	-4.96666	35.47999	1.660	11	.125
Pair 47	Pre Working Conditions – Post Working Climate	59.6983	55.8283	3.87000	24.66276	7.11953	-11.79997	19.53997	.544	11	.598

SD = 3.4), phase three (*M* = 7.57, *SD* = 3.25), and the overall mean in the PACU was (*M* = 8.05, *SD* = 3.24). A one-way ANOVA revealed no significant differences between the mean scores in all three phases ($F(66,68) = 0.207$, $p = 0.814$).

Phase one. During phase one, only three of the 24 items were statistically significant in the paired-samples *t* test. The mean on NPO Status on the PACU Handoff Evaluation forms (*M* = 2.71, *SD* = 0.46) was significantly higher than the mean on the OR Handoff Evaluation forms (*M* = 1.5, *SD* = 0.86), ($t(41) = 7.51$, $p < 0.00$). The mean on the Skin item on the PACU Handoff Evaluation forms (*M* = 2.98, *SD* = 0.15) was significantly higher than the mean on the OR Handoff Evaluation forms (M = 2.62, *SD* = 0.77), ($t(41) = 2.93$, $p < 0.006$). The mean on Shift item on the PACU Handoff Evaluation forms (*M* = 1.24, *SD* = 0.62) was significantly higher than the mean on the OR Handoff Evaluation forms was (*M* =1.02, *SD* = 0.15), ($t(41) = 0.04$, $p < 0.037$). The scores for these items indicated that PACU nurses reported they received these items in handoff more often than OR nurses reported giving them (see Table 4.6).

In addition, six items approached significance: History, DNR, Blood, Equipment, Family, and Plan. The mean of the History item on the PACU Handoff Evaluation (*M* = 1.45, *SD* = 0.80) was compared to the mean on the OR SBAR Handoff forms (*M* = 1.81, *SD* = 0.99), ($t(41) = -1.776$, $p = 0.083$). The mean of the DNR item on the PACU Handoff Evaluation forms (*M* = 2.88, *SD* = 0.39) was compared to the mean on the OR SBAR Handoff forms (*M* = 2.64, *SD* = 0.73), ($t(41) = 1.76$, $p = 0.086$). The mean of the Blood item on the PACU Handoff Evaluation forms (*M* = 2.96, *SD* = 0.22) was compared to the mean on the OR SBAR Handoff forms (*M* =2.79, *SD* = 0.52), ($t(41) = 1.86$, $p = 0.07$). The mean of the Equipment item on the PACU Handoff Evaluation

Table 4.6 *Handoff Evaluation Form OR PACU Phase One Paired-Samples t Test*

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PACU Name – OR Name	-.07143	.46291	.07143	-.21568	.07282	-1.000	41	.323
Pair 2	PACU Allergies – OR Allergies	-.07143	1.31396	.20275	-.48089	.33803	-.352	41	.726
Pair 3	PACU NPO – OR NPO	1.21429	1.04848	.16178	.88756	1.54101	7.506	41	.000
Pair 4	PACU Physician – OR Physician	-.02381	.56258	.08681	-.19912	.15150	-.274	41	.785
Pair 5	PACU History – OR History	-.35714	1.30331	.20110	-.76328	.04900	-1.776	41	.083
Pair 6	PACU Labs – OR Labs	.19048	1.13133	.17457	-.16207	.54302	1.091	41	.282
Pair 7	PACU Antibiotics – OR Antibiotics	-.16667	.85302	.13162	-.43249	.09915	-1.266	41	.213
Pair 8	PACU DNR – OR DNR	.23810	.87818	.13551	-.03556	.51175	1.757	41	.086
Pair 9	PACU Religion – OR Religion	.14286	.60773	.09378	-.04653	.33224	1.523	41	.135
Pair 10	PACU Procedure – OR Procedure	.04762	1.03482	.15968	-.27485	.37009	.298	41	.767
Pair 11	PACU Implants – OR Implant	.14286	.81365	.12555	-.11069	.39641	1.138	41	.262
Pair 12	PACU Blood – OR Blood	.16667	.58086	.08963	-.01434	.34768	1.860	41	.070
Pair 13	PACU Drain Catheter – OR Drain Catheter	-.16667	1.18767	.18326	-.53677	.20344	-.909	41	.368
Pair 14	PACU Dressings – OR Dressings	-.09524	1.12205	.17314	-.44489	.25442	-.550	41	.585
Pair 15	PACU Neuro – OR Neuro	.04762	.53885	.08315	-.12030	.21554	.573	41	.570
Pair 16	PACU Circulation – OR Circulation	.02381	.56258	.08681	-.15150	.19912	.274	41	.785
Pair 17	PACU Position – OR Position	.11905	.50376	.07773	-.03794	.27603	1.532	41	.133
Pair 18	PACU Skin – OR Skin	.35714	.79084	.12203	.11070	.60359	2.927	41	.006
Pair 19	PACU Equipment – OR Equipment	.16667	.58086	.08963	-.01434	.34768	1.860	41	.070
Pair 20	PACU Additional – OR Additional	-.07143	.74549	.11503	-.30374	.16088	-.621	41	.538
Pair 21	PACU Family – OR Family	.23810	.84995	.13115	-.02677	.50296	1.815	41	.077
Pair 22	PACU Comments – OR Comments	.42857	4.78892	.73895	-1.06376	1.92091	.580	41	.565
Pair 23	PACU Abnormal – OR Abnormal	.09524	.69175	.10674	-.12033	.31080	.892	41	.377
Pair 24	PACU Plan – OR Plan	.19048	.67130	.10358	-.01871	.39967	1.839	41	.073
Pair 25	PACU Shift – OR Shift	.21429	.64527	.09957	.01320	.41537	2.152	41	.037

forms (*M* = 2.98, *SD* = 0.15) was compared to the mean on the OR Handoff Evaluation forms (*M* = 2.81, *SD* = 0.55), (*t*(41) = 1.86, *p* = 0.07). The mean of the Family item on the PACU Handoff Evaluation forms (*M* = 2.90, *SD* = 0.37) was compared to the mean on the OR Handoff Evaluation (*M* = 2.67, *SD* = 0.72), (*t*(41) = 1.85, *p* = 0.077).

The mean of the Plan item on the PACU Handoff Evaluation forms (*M* = 2.95, *SD* = 0.22) was compared to the mean on the OR Handoff Evaluation forms (*M* = 2.76, *SD* = 0.62), (*t*(41) =1.84, *p* = 0.073) (see Table 4.6). These findings indicated, other than the History item, that all these items were not received by PACU nurses even though OR nurses reported giving them in handoff. PACU nurses reported they did not receive the History item as often as the OR nurses report they gave it.

The pairs of PACU Handoff Evaluation forms and OR SBAR Handoff forms, matched by surgical patient, were analyzed with an independent-samples *t* test. Three items showed significant results and included: NPO, Skin, and Shift. The mean of NPO item the Handoff Evaluation forms in the PACU (*M* = 2.71, *SD* = 0.46) was significantly higher than the mean in the OR (*M* = 1.50, *SD* = 0.86), (*t*(82) = 8.061, *p* = 0.000). The mean of the Skin item on the Handoff Evaluation forms in the PACU (*M* = 2.98, *SD* = 0.15) was significantly higher than the mean in the OR (*M* = 2.62, *SD* = 0.76), (*t*(82) = -2.97, p = 0.004). The mean of the Shift item on the Handoff Evaluation forms in the PACU (*M* = 1.24, *SD* = 0.62) was significantly higher than the mean in the OR (*M* = 1.02, *SD* = 0.15), (*t*(82) = 2.18, *p* = 0.032) (see Table 4.7). This indicated that these three items were scored higher in the PACU, meaning that PACU nurses reported receiving these items more than OR nurses reported giving them during handoff.

Table 4.7 *Handoff Evaluation Form OR PACU Phase One Independent-Samples t Test*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Name	Equal variances assumed	4.401	.039	-1.011	82	.315	-.07143	.07065	-.21197	.06912
	Equal variances not assumed			-1.011	51.337	.317	-.07143	.07065	-.21324	.07038
Allergies	Equal variances assumed	.752	.388	-.380	82	.705	-.07143	.18803	-.44548	.30262
	Equal variances not assumed			-.380	81.660	.705	-.07143	.18803	-.44550	.30264
NPO	Equal variances assumed	20.389	.000	8.061	82	.000	1.21429	.15063	.91463	1.51394
	Equal variances not assumed			8.061	62.358	.000	1.21429	.15063	.91321	1.51536
Physician	Equal variances assumed	.346	.558	-.281	82	.780	-.02381	.08487	-.19265	.14503
	Equal variances not assumed			-.281	77.934	.780	-.02381	.08487	-.19278	.14517
History	Equal variances assumed	16.492	.000	-1.812	82	.074	-.35714	.19708	-.74919	.03490
	Equal variances not assumed			-1.812	78.524	.074	-.35714	.19708	-.74945	.03516
Labs	Equal variances assumed	5.398	.023	1.074	82	.286	.19048	.17740	-.16242	.54337
	Equal variances not assumed			1.074	79.097	.286	.19048	.17740	-.16262	.54357
Antibiotics	Equal variances assumed	7.123	.009	-1.201	82	.233	-.16667	.13878	-.44275	.10942
	Equal variances not assumed			-1.201	70.345	.234	-.16667	.13878	-.44344	.11010
DNR	Equal variances assumed	16.000	.000	1.866	82	.066	.23810	.12762	-.01579	.49198
	Equal variances not assumed			1.866	63.312	.067	.23810	.12762	-.01692	.49311
Religion	Equal variances assumed	11.099	.001	1.563	82	.122	.14286	.09139	-.03894	.32465
	Equal variances not assumed			1.563	53.234	.124	.14286	.09139	-.04042	.32613
Procedure	Equal variances assumed	.411	.523	.320	82	.750	.04762	.14892	-.24864	.34387
	Equal variances not assumed			.320	81.513	.750	.04762	.14892	-.24866	.34390
Implants	Equal variances assumed	2.730	.102	.951	82	.344	.14286	.15022	-.15597	.44169
	Equal variances not assumed			.951	80.264	.344	.14286	.15022	-.15607	.44178
Blood	Equal variances assumed	16.807	.000	1.920	82	.058	.16667	.08681	-.00602	.33935
	Equal variances not assumed			1.920	54.702	.060	.16667	.08681	-.00732	.34065
Drain/ Catheter	Equal variances assumed	3.482	.066	-.890	82	.376	-.16667	.18729	-.53925	.20592
	Equal variances not assumed			-.890	80.644	.376	-.16667	.18729	-.53934	.20601

(Table 4.7 *Handoff Evaluation Form OR PACU Phase One Independent-Samples t Test* Cont.)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Dressings	Equal variances assumed	.400	.529	-.499	82	.619	-.09524	.19069	-.47459	.28411
	Equal variances not assumed			-.499	81.945	.619	-.09524	.19069	-.47459	.28412
Neuro	Equal variances assumed	1.281	.261	.591	82	.556	.04762	.08061	-.11275	.20798
	Equal variances not assumed			.591	80.319	.556	.04762	.08061	-.11280	.20804
Circulation	Equal variances assumed	.292	.590	.285	82	.776	.02381	.08356	-.14242	.19004
	Equal variances not assumed			.285	81.651	.776	.02381	.08356	-.14243	.19005
Position	Equal variances assumed	10.719	.002	1.553	82	.124	.11905	.07666	-.03345	.27154
	Equal variances not assumed			1.553	49.657	.127	.11905	.07666	-.03495	.27304
Skin	Equal variances assumed	53.908	.000	2.971	82	.004	.35714	.12020	.11802	.59627
	Equal variances not assumed			2.971	44.343	.005	.35714	.12020	.11494	.59934
Equipment	Equal variances assumed	16.676	.000	1.886	82	.063	.16667	.08839	-.00916	.34249
	Equal variances not assumed			1.886	47.377	.065	.16667	.08839	-.01111	.34444
Additional	Equal variances assumed	1.042	.310	-.544	82	.588	-.07143	.13120	-.33243	.18958
	Equal variances not assumed			-.544	80.873	.588	-.07143	.13120	-.33249	.18963
Family	Equal variances assumed	16.909	.000	1.903	82	.061	.23810	.12511	-.01078	.48697
	Equal variances not assumed			1.903	61.197	.062	.23810	.12511	-.01206	.48825
Comments	Equal variances assumed	1.771	.187	.573	82	.568	.42857	.74810	-1.05963	1.91677
	Equal variances not assumed			.573	42.611	.570	.42857	.74810	-1.08051	1.93765
Abnormal	Equal variances assumed	3.600	.061	.929	82	.356	.09524	.10251	-.10869	.29916
	Equal variances not assumed			.929	71.703	.356	.09524	.10251	-.10913	.29960
Plan	Equal variances assumed	17.046	.000	1.888	82	.063	.19048	.10088	-.01020	.39116
	Equal variances not assumed			1.888	50.853	.065	.19048	.10088	-.01206	.39301
Shift	Equal variances assumed	23.693	.000	2.183	82	.032	.21429	.09817	.01900	.40958
	Equal variances not assumed			2.183	46.105	.034	.21429	.09817	.01669	.41188

Six other items approached significance and these included: History, DNR, Blood, Equipment, Family, and Plan. The mean of History item on the Handoff Evaluation forms in the PACU (M = 1.45, SD = 0.80) was compared to the mean in the OR (M = 1.81, SD = 0.99), (t(82) = -1.81, p = 0.074). The mean of the DNR item on the Handoff Evaluation forms in the PACU (M = 2.88, SD = 0.39) was compared to the mean in the OR (M = 2.64, SD =0.73), (t(82) = 1.87, p = 0.066). The mean of the Blood item on the Handoff Evaluation forms in the PACU (M = 2.95, SD = 0.22) was compared to the mean in the OR (M = 2.79, SD = 0.52), (t(82) = 1.92, p = 0.058). The mean of the Equipment item on the Handoff Evaluation forms in the PACU (M = 2.98, SD = 0.15) was compared to the mean in the OR (M = 2.81, SD = 0.55), (t(82) = 1.86, p = 0.063). The mean of the Family item on the Handoff Evaluation forms in the PACU (M = 2.90, SD = 0.37) was compared to the mean in the OR (M = 2.67, SD = 0.72), (t(82) = 1.90, p = 0.061). The mean of the Plan item on the Handoff Evaluation forms in the PACU (M = 2.95, SD = 0.22) was compared to the mean in the OR (M = 2.76, SD = 0.62), (t(82) = 1.89, p = 0.063) (see Table 4.7). Except for the History item, all items that approached significance were reported as being received during by PACU nurses when compared to OR nurses who reported not giving the items during handoff.

Phases one, two, & three. In order to compare data from the Handoff Evaluation forms in each of the three phases in the PACU, a one-way ANOVA was run to investigate variability of each item on the Handoff Evaluation form. The results of the ANOVA support the conclusion that there were no significant differences between the three phases in any of the 24 items reported (see Table 4.8).

Table 4.8 *Handoff Evaluation Form PACU Three Phases One-Way ANOVA*

		Sum of Squares	df	Mean Square	F	Sig.
Name	Between Groups	.000	2	.000	.	.
	Within Groups	.000	66	.000		
	Total	.000	68			
Allergies	Between Groups	.054	2	.027	.145	.866
	Within Groups	12.236	66	.185		
	Total	12.290	68			
NPO	Between Groups	.005	2	.003	.012	.988
	Within Groups	14.198	66	.215		
	Total	14.203	68			
Physician	Between Groups	.043	2	.021	.743	.480
	Within Groups	1.899	66	.029		
	Total	1.942	68			
History	Between Groups	.030	2	.015	.101	.904
	Within Groups	9.883	66	.150		
	Total	9.913	68			
Labs	Between Groups	.260	2	.130	.788	.459
	Within Groups	10.899	66	.165		
	Total	11.159	68			
Antibiotics	Between Groups	.096	2	.048	.694	.503
	Within Groups	4.542	66	.069		
	Total	4.638	68			
DNR	Between Groups	.217	2	.109	1.045	.357
	Within Groups	6.855	66	.104		
	Total	7.072	68			
Religion	Between Groups	.012	2	.006	.103	.902
	Within Groups	3.756	66	.057		
	Total	3.768	68			
Procedure	Between Groups	.128	2	.064	.500	.609
	Within Groups	8.423	66	.128		
	Total	8.551	68			
Implants	Between Groups	.157	2	.078	.530	.591
	Within Groups	9.756	66	.148		
	Total	9.913	68			
Blood	Between Groups	.037	2	.019	.646	.528
	Within Groups	1.905	66	.029		
	Total	1.942	68			
Drain/Catheter	Between Groups	.006	2	.003	.014	.986
	Within Groups	14.603	66	.221		
	Total	14.609	68			
Dressings	Between Groups	.413	2	.206	1.020	.366
	Within Groups	13.355	66	.202		
	Total	13.768	68			

(Table 4.8 *Handoff Evaluation Form PACU Three Phases One-Way ANOVA Cont.)*

		Sum of Squares	df	Mean Square	F	Sig.
Neuro	Between Groups	.036	2	.018	.422	.657
	Within Groups	2.833	66	.043		
	Total	2.870	68			
Circulation	Between Groups	.000	2	.000	.002	.998
	Within Groups	4.637	66	.070		
	Total	4.638	68			
Position	Between Groups	.042	2	.021	.487	.617
	Within Groups	2.828	66	.043		
	Total	2.870	68			
Skin	Between Groups	.042	2	.021	.487	.617
	Within Groups	2.828	66	.043		
	Total	2.870	68			
Equipment	Between Groups	.037	2	.019	.646	.528
	Within Groups	1.905	66	.029		
	Total	1.942	68			
Additional	Between Groups	.030	2	.015	.101	.904
	Within Groups	9.883	66	.150		
	Total	9.913	68			
Family	Between Groups	.072	2	.036	.437	.648
	Within Groups	5.407	66	.082		
	Total	5.478	68			
Comments	Between Groups	1.067	2	.534	2.682	.076
	Within Groups	13.136	66	.199		
	Total	14.203	68			
Abnormal	Between Groups	.059	2	.030	.528	.592
	Within Groups	3.709	66	.056		
	Total	3.768	68			
Plan	Between Groups	.112	2	.056	.817	.446
	Within Groups	4.526	66	.069		
	Total	4.638	68			
Total Score	Between Groups	4.427	2	2.214	.207	.814
	Within Groups	707.341	66	10.717		
	Total	711.768	68			
Shift	Between Groups	.158	2	.079	.678	.511
	Within Groups	7.668	66	.116		
	Total	7.826	68			
Department	Between Groups	.000	2	.000	.	.
	Within Groups	.000	66	.000		
	Total	.000	68			

Frequencies were completed for all of the Handoff Evaluation form data from both departments. Data from all three phases of the EBP project provided useful information on trends of items reported during handoff. Emphasis was placed on items answers where ‘No’ was the trending entry, as ‘Yes’ and ‘NA’ answers indicated that the item was either addressed during a handoff or not appropriate. Seven items showed interesting findings and these included Allergies, NPO, Labs, Antibiotics, Dressings, Additional, and Abnormal (see Table 4.9). These items displayed a wide range of reported frequencies in each phase of implementation, although overall reports were not significant.

SBAR Handoff Form.

Phase two. The OR SBAR Handoff forms were treated similarly to the Handoff Evaluation forms with independent-sample *t* tests, frequencies, and mean scores were completed on the data to observe changes and trends in each phase. Mean total score calculations on the SBAR Handoff form in phase two were (M = 12.38, SD = 3.69) and the overall mean from both phases two and three (M = 11.92, SD = 3.54).

Phases two and three SBAR Handoff Forms were compared via an independent-samples *t* test which showed that one item was statistically significant and that three others approached significance. The mean of the Implants item on the SBAR Handoff form from phase two in the OR (M = 0.92, SD = 0.28) was significantly higher than the mean from phase 3 in the OR (M = 0.57, SD = 0.51), ($t(25) = 2.19$, $p < 0.038$). This indicated that OR nurses significantly reported the implant item more in phase two when compared to phase three (see Table 4.10).

Table 4.9 *Handoff Evaluation Form Item Frequencies*

	Phase 1				Phase 2		Phase 3	
Item	PACU 1 (N=31) Frequency & %	OR 1 (N=31) Frequency & %	PACU 2 (N=11) Frequency & %	OR 2 (N=11) Frequency & %	PACU 3 (N=0) Frequency & %	PACU 4 (N=13) Frequency & %	PACU 5 (N=5) Frequency & %	PACU 6 (N=9) Frequency & %
Name	Yes–31:100% No-0:0% Na– 0:0%	Yes–29: 93% No-0:0% Na– 2:6.5%	Yes-10:90.1% No-1:9.1% Na-0:0%	Yes-11:100% No-0:0% Na-0:0%	Yes-0:0% No-0:0% Na-0:0%	Yes-13:100% No-0:0% Na-0:0%	Yes-5:100% No-0:0% Na-0:0%	Yes-9:100% No-0:0% Na-0:0%
Allergies	Yes-22:71% No-0:0 % Na-0:29%	Yes-25:80.6% No-1:3.2 % Na-5:16.1%	Yes-9:81.8% No-0:0% Na-2:18.2%	Yes-5:45.5% No-0:0% Na-6:54.5%	Yes-0:0% No-0:0% Na-0:0%	Yes-9:69.2% No-1:7.7% Na-3:23.1%	Yes-3:60% No-2:40% Na-0:0%	Yes-7:77.8% No-0:0% Na-2:22.2%
NPO	Yes-0:0% No-7:22.6% Na-24:77.4%	Yes-22:71% No-1:3.2% Na-8:25.8%	Yes-5:45.5% No-6:54.5% Na-0:0%	Yes-9:81.8% No-0:0% Na-2:18.2%	Yes-0:0% No-0:0% Na-0:0%	Yes-4:30.8% No-0:0% Na-9:69.2%	Yes-1:20% No-4:80% Na-0:0%	Yes-1:11.1% No-2:22.2% Na-6:66.7%
Physi-cian	Yes-30:96.8% No-0:0% Na-1:3.2%	Yes-29:93.5% No-0:0% Na-2:6.5%	Yes-10:90.1% No-1:9.1% Na-0:0%	Yes-11:100% No-0:0% Na-0:0%	Yes-0:0% No-0:0% Na-0:0%	Yes-12:92.3% No-0:0% Na-1:7.7%	Yes-5:100% No-0:0% Na-0:0%	Yes-9:100% No-0:0% Na-0:0%
History	Yes-22:71% No-2:6.5% Na-7:22.6%	Yes-22:71% No-0:0% Na-9:29%	Yes-9:81.8% No-1:9.1% Na-1:9.1%	Yes-3:27.3% No-0:0% Na-8:72.2%	Yes-0:0% No-0:0% Na-0:0%	Yes-11:84.6% No-0:0% Na-2:15.4%	Yes-4:80% No-0:0% Na-1:20%	Yes-8:88.9% No-0:0% Na-1:11.1%
Labs	Yes-6:19.4% No-2:65% Na-23:74.2%	Yes-8:25.8% No-1:3.2% Na-22:71%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-3:27.3% No-1:9.1% Na-7:63.6%	Yes-0:0% No-0:0% Na-0:0%	Yes-1:7.7% No-0:0% Na-12:92.3%	Yes-0:0% No-0:0% Na-5:100%	Yes-3:33.3% No-0:0% Na-6:67%
Antibiotic	Yes-27:87.1% No-2:6.5% Na-2:6.5%	Yes-25:80.6% No-0:0% Na-6: 19.4%	Yes-10:90.1% No-1:9.1% Na-0:0%	Yes-10:90.9% No-0:0% Na-1:9.1%	Yes-0:0% No-0:0% Na-0:0%	Yes-11:84.6% No-1:7.7% Na-1:7.7%	Yes-5:100% No-0:0% Na-0:0%	Yes-7:77.8% No-0:0% Na-2:22.2%
DNR	Yes-1:3.2% No-2:6.5% Na-28:90.3%	Yes-5:16.1% No-1:3.2% Na-25:80.6%	Yes-0:0% No-1:9.1% Na-10:90.1%	Yes-1:9.1% No-2:18.2% Na-8:72.7%	Yes-0:0% No-0:0% Na-0:0%	Yes-3:23.1% No-0:0% Na-10:76.9%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-1:11.1% Na-8:88.9%
Religion	Yes-1:3.2% No-0:0% Na-30:96.8%	Yes-3:9.7% No-0:0% Na-28:90.3%	Yes-0:0% No-1:9.1% Na-10:90.1%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-0:0% No-1:7.7% Na-12:92.3%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-1:11.1% Na-8:89.9%
Proce-dure	Yes-27:87.1% No-0:0% Na-4:12.9%	Yes-27:87.1% No-0:0% Na-4:12.9%	Yes-9:81.8% No-0:0% Na-2:18.2%	Yes-10:90.9% No-0:0% Na-1:9.1%	Yes-0:0% No-0:0% Na-0:0%	Yes-12:92.3% No-0:0% Na-1:7.7%	Yes-5:100% No-0:0% Na-0:0%	Yes-6:66.7% No-0:0% Na-3:33.3%
Implants	Yes-3:9.7% No-3:9.7% Na-25:80.6%	Yes-6:19.4% No-4:12.9% Na-21:67.7%	Yes-1:9.1% No-1:9.1% Na-9:81.8%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-1:7.7% No-0:0% Na-12:92.3%	Yes-2:40% No-0:0% Na-3:60%	Yes-1:11.1% No-0:0% Na-8:88.9%
Blood	Yes-2:6.5% No-0:0% Na-29:93.5%	Yes-2:6.5% No-3:9.7% Na-26:83.9%	Yes-0:0% No-0:0% Na-11:100%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-0:0% No-0:0% Na-13:100%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-0:0% Na-9:100%

(Table 4.9 *Handoff Evaluation Form Item Frequencies Cont.)*

	Phase 1				Phase 2		Phase 3	
Item	PACU 1 (N=31) Frequency & %	OR 1 (N=31) Frequency & %	PACU 2 (N=11) Frequency & %	OR 2 (N=11) Frequency & %	PACU 3 (N=0) Frequency & %	PACU 4 (N=13) Frequency & %	PACU 5 (N=5) Frequency & %	PACU 6 (N=9) Frequency & %
Drain/ Catheter	Yes-9:29% No-1:3.2% Na-21:67.7%	Yes-3:9.7% No-2:6.5% Na-26:83.9%	Yes-3:27.3% No-0:0% Na-8:72.7%	Yes-5:45.5% No-6:54.5% Na-0:0%	Yes-0:0% No-0:0% Na-0:0%	Yes-4:30.8% No-0:0% Na-9:69.2%	Yes-1:20% No-0:0% Na-4:80%	Yes-2:2.2% No-1:11.1% Na-6:66.7%
Dressi-ngs	Yes-23:74.2% No-1:3.2% Na-7:22.6%	Yes-18:58.1% No-2:6.5% Na-11:35.5%	Yes-8:72.7% No-0:0% Na-3:27.3%	Yes-10:90.9% No-1:9.1% Na-0:0%	Yes-0:0% No-0:0% Na-0:0%	Yes-10:76.9% No-0:0% Na-3:23.1%	Yes-5:100% No-0:0% Na-0:0%	Yes-3:33.3% No-0:0% Na-6:66.7%
Neuro	Yes-1:3.2% No-1:3.2% Na-29:93.5%	Yes-1:3.2% No-2:6.5% Na-28:90.3%	Yes-0:0% No-0:0% Na-11:100%	Yes-0:0% No-1:9.1% Na-10:90.9%	Yes-0:0% No-0:0% Na-0:0%	Yes-0:0% No-0:0% Na-13:100%	Yes-0:0% No-0:0% Na-5:100%	Yes-1:11.1% No-0:0% Na-8:88.9%
Circula-tion	Yes-1:3.2% No-2:6.5% Na-28:90.3%	Yes-1:3.2% No-1:3.2% Na-29:93.5%	Yes-0:0% No-0:0% Na-11:100%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-1:7.7% No-0:0% Na-12:92.3%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-1:11.1% Na-8:88.9%
Position	Yes-1:3.2% No-0:0% Na-30:96.8%	Yes-2:6.5% No-0:0% Na-29:93.5%	Yes-0:0% No-0:0% Na-11:100%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-1:7.7% No-0:0% Na-12:92.3%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-1:11.1% Na-8:88.9%
Skin	Yes-1:3.2% No-0:0% Na-30:96.8%	Yes-4:12.9% No-0:0% Na-27:87.1%	Yes-0:0% No-0:0% Na-11:100%	Yes-3:27.3% No-2:18.2% Na-6:54.5%	Yes-0:0% No-0:0% Na-0:0%	Yes-1:7.7% No-0:0% Na-12:92.3%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-1:11.1% Na-8:88.9%
Equip-ment	Yes-1:3.2% No-0:0% Na-30:96.8%	Yes-3:6.5% No-0:0% Na-28:93.5%	Yes-0:0% No-0:0% Na-11:100%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-0:0% No-0:0% Na-13:100%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-1:11.1% Na-8:88.9%
Addition-al	Yes-3:9.7% No-3:9.7% Na-25:80.6%	Yes-3:9.7% No-1:3.2% Na-27:87.1%	Yes-1:9.1% No-1:9.1% Na-9:%80.8	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-2:15.4% No-0:0% Na-11:84.6%	Yes-1:20% No-0:0% Na-4:80%	Yes-0:0% No-1:11.1% Na-8:88.9%
Family	Yes-1:3.2% No-1:3.2% Na-29:93.5%	Yes-6:19.4% No-0:0% Na-25:80.6%	Yes-0:0% No-1:9.1% Na-10:90.9%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-2:15.4% No-0:0% Na-11:84.6%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-1:11.1% Na-8:88.9%
Com-ments	Yes-9:29% No-2:6.5% Na-20:64.5%	Yes-5:16.1% No-0:0% Na-26:83.9%	Yes-2:18.2% No-1:%9.1 Na-8:72.7%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-6:46.2% No-0:0% Na-7:53.8%	Yes-0:0% No-0:0% Na-5:100%	Yes-1:11.1% No-0:0% Na-8:88.9%
Abnor-mal	Yes-1:3.2% No-1:3.2% Na-29:93.5%	Yes-3:9.7% No-0:0% Na-28:90.3%	Yes-0:0% No-1:9.1% Na-10:90.9%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-1:7.7% No-12:92.3% Na-0:0%	Yes-0:0% No-0:0% Na-5:100%	Yes-0:0% No-0:0% Na-9:100%
Plan	Yes-0:0% No-1:3.2% Na-30:96.8%	Yes-4:12.9% No-0:0% Na-27:87.1%	Yes-0:0% No-1:9.1% Na-10:90.9%	Yes-0:0% No-2:18.2% Na-9:81.8%	Yes-0:0% No-0:0% Na-0:0%	Yes-2:15.4% No-0:0% Na-11:84.6%	Yes-0:0% No-0:0% Na-5:100%	Yes-1:11.1% No-0:0% Na-8:88.9%
Shift 7a-3p 9a-5p	 31:100% 0:0%	 30:96.8% 1:3.2%	 11:100%	 11:100%	 0:0%	 10:76.9% 3:23.1%	 4:80% 1:20%	 7:77.8% 2:22.2%

Table 4.10 *SBAR Handoff Form Phases Two & Three Independent-Samples t Test*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
NPO	Equal variances assumed	24.826	.000	1.812	25	.082	.21429	.11827	-.02929	.45786
	Equal variances not assumed			1.883	13.000	.082	.21429	.11380	-.03157	.46014
DNR	Equal variances assumed	24.826	.000	1.812	25	.082	.21429	.11827	-.02929	.45786
	Equal variances not assumed			1.883	13.000	.082	.21429	.11380	-.03157	.46014
Allergies	Equal variances assumed	4.467	.045	.985	25	.334	.13736	.13952	-.14998	.42470
	Equal variances not assumed			1.000	22.504	.328	.13736	.13736	-.14714	.42187
Procedure	Equal variances assumed	5.142	.032	-1.039	25	.309	-.07692	.07401	-.22935	.07551
	Equal variances not assumed			-1.000	12.000	.337	-.07692	.07692	-.24452	.09068
Implants	Equal variances assumed	27.889	.000	2.188	25	.038	.35165	.16070	.02069	.68261
	Equal variances not assumed			2.235	20.282	.037	.35165	.15734	.02374	.67956
Antibiotics	Equal variances assumed	5.142	.032	-1.039	25	.309	-.07692	.07401	-.22935	.07551
	Equal variances not assumed			-1.000	12.000	.337	-.07692	.07692	-.24452	.09068
Position	Equal variances assumed	.011	.917	-.052	25	.959	-.00549	.10482	-.22138	.21039
	Equal variances not assumed			-.052	24.679	.959	-.00549	.10497	-.22183	.21084
Laterality	Equal variances assumed	10.068	.004	-1.394	25	.176	-.20879	.14977	-.51726	.09967
	Equal variances not assumed			-1.420	21.359	.170	-.20879	.14702	-.51423	.09665
Device	Equal variances assumed	24.826	.000	-1.812	25	.082	-.21429	.11827	-.45786	.02929
	Equal variances not assumed			-1.883	13.000	.082	-.21429	.11380	-.46014	.03157
Anesthesia	Equal variances assumed	1.162	.291	.527	25	.603	.06593	.12510	-.19172	.32358
	Equal variances not assumed			.532	24.142	.599	.06593	.12384	-.18958	.32145
Medications	Equal variances assumed	1.963	.174	-.698	25	.492	-.12637	.18102	-.49919	.24644
	Equal variances not assumed			-.701	24.942	.489	-.12637	.18015	-.49744	.24470
Blood	Equal variances assumed	4.347	.047	-.962	25	.345	-.07143	.07423	-.22431	.08145
	Equal variances not assumed			-1.000	13.000	.336	-.07143	.07143	-.22574	.08288
Drain/Catheter	Equal variances assumed	.858	.363	.534	25	.598	.10440	.19556	-.29838	.50717
	Equal variances not assumed			.533	24.648	.599	.10440	.19589	-.29933	.50812
Location	Equal variances assumed	2.756	.109	-.803	25	.430	-.13187	.16431	-.47026	.20653
	Equal variances not assumed			-.809	24.500	.426	-.13187	.16293	-.46778	.20404

(Table 4.10 *SBAR Handoff Form Phases Two & Three Independent-Samples t Test Cont.)*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Dressings	Equal variances assumed	5.293	.030	1.450	25	.159	.26923	.18564	-.11311	.65157
	Equal variances not assumed			1.460	24.797	.157	.26923	.18446	-.11082	.64928
Equipment	Equal variances assumed	3.370	.078	.949	25	.352	.17033	.17957	-.19951	.54017
	Equal variances not assumed			.942	23.557	.356	.17033	.18076	-.20312	.54378
History	Equal variances assumed	.080	.780	-.142	25	.888	-.02747	.19322	-.42541	.37046
	Equal variances not assumed			-.142	24.775	.888	-.02747	.19335	-.42587	.37093
Labs	Equal variances assumed	3.370	.078	.949	25	.352	.17033	.17957	-.19951	.54017
	Equal variances not assumed			.942	23.557	.356	.17033	.18076	-.20312	.54378
Skin	Equal variances assumed	.099	.755	.553	25	.585	.10989	.19879	-.29952	.51930
	Equal variances not assumed			.553	24.810	.585	.10989	.19887	-.29984	.51962
Notes	Equal variances assumed	5.142	.032	1.039	25	.309	.07692	.07401	-.07551	.22935
	Equal variances not assumed			1.000	12.000	.337	.07692	.07692	-.09068	.24452
Family	Equal variances assumed	1.324	.261	.569	25	.574	.08791	.15449	-.23026	.40609
	Equal variances not assumed			.565	23.392	.577	.08791	.15560	-.23368	.40950
Total Score	Equal variances assumed	.108	.745	.641	25	.527	.88462	1.37925	-1.95600	3.72523
	Equal variances not assumed			.640	24.557	.528	.88462	1.38230	-1.96489	3.73412

The mean of the NPO item on the SBAR Handoff form from phase two in the OR (*M* = 1.00, *SD* = 0.00) was compared to the mean from phase 3 in the OR (*M* = 0.79, *SD* = 0.43), (*t(25*) = 1.81, *p = 0.082*). The mean of the DNR item on the SBAR Handoff form from phase two in the OR (*M* = 1.00, *SD* = 0.00) was compared to the mean from phase 3 in the OR (*M* = 0.79, *SD* = 0.43), (*t(25*) = 1.81, *p = 0.082*). The mean of the Device item on the SBAR Handoff form from phase two in the OR (*M* = 0.00, *SD* = 0.00) was compared to the mean from phase 3 in the OR (*M* = 0.21, *SD* = 0.43), (*t(25*) = -0.81, *p = 0.082*). This data indicated that the NPO and DNR item were reported more in phase two when compared to phase three and that the Device item was reported more in phase three than in phase two (see Table 4.10).

Phase three. An independent *t* test, frequencies and mean scores were completed on the SBAR Handoff Form data. Means were also calculated for total scores on the SBAR Handoff form in phase three (*M* = 11.5, *SD* = 3.48). An independent *t* test revealed that there was no significant difference between the scores in phase two when compared to phase three (*t*(82) = 1.81, *p* = 0.241).

Frequencies from the SBAR Handoff forms from phase two and three were useful in discovering trends in the reported items. Both ‘Yes’ and ’No’ items were considered as reported during a handoff, and ‘Not Indicated’ (NI) answers were considered items that were not communicated. Several items showed interesting findings in variability when compared with an independent *t* test: Allergies, History, Labs, Implants, Drain/Catheter, Location, Equipment, Laterality, Device, Medication, Other, and Notes. There was considerable variability in the reported handoff items when

compared over the course of the EBP project, although they ultimately were not significant.

Allergies showed an increase in ‘NI’ answers from 7.7% in week 4 to 33.3% in week 6. History showed an increase in NI answers from 38.5% in week 4 to 40% in week 5, but then decreased to 33.3% in week 6. Labs showed an increase in ‘NI’ answers from 61.5% in week 4 to 100% in week 5, but then decreased to 33.3% in week 6. Implants showed an increase in ‘NI’ answers from 7.7% in week 4, 40% in week 5, and 44% in week 6. Drain/Catheter showed an increase in ‘NI’ answers from 53.8% in week 4, 60% in week 5, and 66.7% in week 6. Location showed a decrease in ‘NI’ answers from 84.6% in week 4 to 60% in week 5, but then increased to 77.8% in week 6. Equipment showed an increase in ‘NI’ answers from 61.5% in week 4 to 80% in week 5, but then decreased to 77.8% in week 6. Laterality showed a decrease in ‘NI’ answers from 92.3% in week 4 to 60% in week 5, but increased to 77.8% in week 6. Device showed a decrease in ‘NI’ answers from 100% in week 4 to 60% in week 5, but increased to 88.9% in week 6. Medication showed a decrease in ‘NI’ answers from 53.8% in week 4 to 40% in week 5, but increased to 77.8 in week 6. The Other item showed ‘NI’ answers being 100% from weeks 4-6. Finally, Notes showed an increase in ‘NI’ answers from 92.3% in week 4 to 100% in weeks 5 and 6 (see Table 4.11).

MIDAS Reports.

An audit of MIDAS reports was conducted to observe any changes in reportable patient events. During the two weeks prior to the start of the EBP project and also during two weeks of phase one, there were no reported events regarding communication and patient safety. In phases two and three, with the implementation of

Table 4.11 *SBAR Handoff Form Item Frequencies*

	Phase 2		Phase 3	
Item	OR 3 (N=0) Frequency & %	OR 4 (N=13) Frequency & %	OR 5 (N=5) Frequency & %	OR 6 (N=9) Frequency & %
Allergies	Yes-0:0% No-0:0% NI[a]-0:0%	Yes-11:84.6% No-1:7.7% NI-1:7.7%	Yes-5:100% No-0:0% NI-0:0%	Yes-6:66.7% No-0:0% NI-3:33.3%
NPO	Yes-0:0% No-0:0% NI-0:0%	Yes-13:100% No-0:0% NI-0:0%	Yes-3:60% No-2:40% NI-0:0%	Yes-6:66.7% No-0:0% NI-3:33.3%
Physician	Yes-0:0% No-0:0% NI-0:0%	Yes-13:100% No-0:0% NI-0:0%	Yes-5:100% No-0:0% NI-0:0%	Yes-9:100% No-0:0% NI-0:0%
History	Yes-0:0% No-0:0% NI-0:0%	Yes-8:61.5% No-0:0% NI-5:38.5%	Yes-3:60% No-0:% NI-2:40%	Yes-6:66.7% No-0:0% NI-3:33.3%
Labs	Yes-0:0% No-0:0% NI-0:0%	Yes-5:38.5% No-0:0% NI-8:61.5%	Yes-0:0% No-0:0% NI-5:100%	Yes-3:33.3% No-0:0% NI-6:66.7%
Antibiotics	Yes-0:0% No-0:0% NI-0:0%	Yes-12:92.3% No-0:0% NI-1:7.7%	Yes-5:100% No-0:0% NI-0:0%	Yes-9:100% No-0:0% NI-0:0%
DNR	Yes-0:0% No-0:0% NI-0:0%	Yes-2:15.4% No-11:84.6% NI-0:0%	Yes-0:0% No-5:100% NI-0:0%	Yes-0:0% No-6:66.7% NI-3:33.3%
Procedure	Yes-0:0% No-0:0% NI-0:0%	Yes-12:92.3% No-0:0% NI-1:7.7%	Yes-5:100% No-0:0% NI-0:0%	Yes-9:100% No-0:0% NI-0:0%
Implants	Yes-0:0% No-0:0% NI-0:0%	Yes-10:76.9% No-2:15.4% NI-1:7.7%	Yes-3:60% No-0:0% NI-2:40%	Yes-5:55.6% No-0:0% NI-4:44.4%
Blood	Yes-0:0% No-0:0% NI-0:0%	Yes-0:0% No-0:0% NI-13:100%	Yes-1:20% No-0:0% NI-4:80%	Yes-0:0% No-0:0% NI-9:100%
Drain/ Catheter	Yes-0:0% No-0:0% NI-0:0%	Yes-6:46.2% No-0:0% NI-7:53.8%	Yes-2:40% No-0:0% NI-3:60%	Yes-3:33.3% No-0:0% NI-6:66.7%
Location	Yes-0:0% No-0:0% NI-0:0%	Yes-2:15.4% No-0:0% NI-11:84.6%	Yes-2:40% No-0:0% NI-3:60%	Yes-2:22.2% No-0:0% NI-7:77.8%
Dressings	Yes-0:0% No-0:0% NI-0:0%	Yes-10:76.9% No-0:0% NI-3:23.1%	Yes-4:80% No-0:0% NI-1:20%	Yes-3:33.3% No-0:0% NI-6:66.7%
Skin	Yes-0:0% No-0:0% NI-0:0%	Yes-7:53.8% No-0:0% NI-6:46.2%	Yes-3:60% No-0:0% NI-2:40%	Yes-3:33.3% No-0:0% NI-6:66.7%
Equipment	Yes-0:0% No-0:0% NI-0:0%	Yes-5:38.5% No-0:0% NI-8:61.5%	Yes-1:20% No-0:0% NI-4:80%	Yes-2:22.2% No-0:0% NI-7:77.8%
Family	Yes-0:0% No-0:0% NI-0:0%	Yes-3:23.1% No-0:0% NI-10:76.9%	Yes-2:40% No-0:0% NI-3:60%	Yes-0:0% No-0:0% NI-9:100%
Position	Supine-0:0% Lithotomy-0:0% Prone-0:0% Side Lying-0:0% NI-0:0%	Supine-10:76.9% Lithotomy-2:15.4% Prone-1:7.7% Side Lying-0:0% NI-0:0%	Supine-4:80% Lithotomy-0:0% Prone-0:0% Side Lying-1:20% NI-0:0%	Supine-3:33.3% Lithotomy-4:44.4% Prone-1:11.1% Side Lying-1:11.1% NI-0:0%

(Table 4.11 *SBAR Handoff Form Item Frequencies Cont.)*

	Phase 2		Phase 3	
Item	OR 3 (N=0) Frequency & %	OR 4 (N=13) Frequency & %	OR 5 (N=5) Frequency & %	OR 6 (N=9) Frequency & %
Laterality	Left-0:0% Right-0:0% NI-0:0%	Left-0:0% Right-1:7.7% NI-12:92.3%	Left-1:20% Right-1:20% NI-3:60%	Left-2:22.2% Right-0:0% NI-7:77.8%
Device	Yes-0:0% No-0:0% NI-0:0%	Yes-0:0% No-0:0% NI-13:100%	Yes-2:40% No-0:0% NI-3:60%	Yes-1:11.1% No-0:0% NI-8:88.9%
Anesthesia	Gen-0:0% MAC-0:0% Local-0:0% Spinal-0:0% NI-0:0%	Gen-9:69.2% MAC-2:15.4% Local-1:7.7% Spinal-1:7.7% NI-0:0%	Gen-3:60% MAC-0:0% Local-2:40% Spinal-0:0% NI-0:0%	Gen-7:77.8% MAC-2:22.2% Local-0:0% Spinal-0:0% NI-0:0%
Medication	Yes-0:0% No-0:0% NI-0:0%	Yes-6:46.2% No-0:0% NI-7:53.8%	Yes-3:60% No-0:0% NI-2:40%	Yes-1:11.1% No-1:11.1% NI-7:77.8%
Other	Yes-0:0% No-0:0% NI-0:0%	Yes-0:0% No-0:0% NI-13:100%	Yes-0:0% No-0:0% NI-5:100%	Yes-0:0% No-0:0% NI-9:100%
Notes	Yes-0:0% No-0:0% NI-0:0%	Yes-1:7.7% No-0:0% NI-12:92.3%	Yes-0:0% No-0:0% NI-5:100%	Yes-0:0% No-0:0% NI-9:100%
Shift 7a-3p	0:0%	13:100%	5:100%	9:100%

[a]NI = Not Indicated

the SBAR handoff intervention, there was only one patient event reported. This event was a physician and PACU nurse communication error and not an OR to PACU nurse communication error. There were no changes in numbers of MIDAS reports that were written in response to OR nurse to PACU nurse communication error.

Chapter 5

Discussion

This EBP project investigated the clinical question: In perioperative nurses, how will the implementation of a written SBAR Handoff Form affect the content of Handoffs between OR and post anesthesia care unit nurses and impact the perceptions of teamwork and patient safety of perioperative nurses over the course of three months when compared to current oral report practice? The goal was to implement a written handoff form which used a mnemonic phrase to aid memory, as recommended by the literature. This goal was measured using the SAQ, a MIDAS risk report audit, and paired SBAR Handoff form and Handoff Evaluation form item trends. This chapter will discuss the findings, applicability of the theoretical and EBP frameworks, strengths and weaknesses of the EBP project, and implications for the future.

Explanation of Findings

The SAQ, Handoff Evaluation form, and SBAR Handoff form utilized in this project were analyzed with multiple statistical tests. Each phase of the EBP project was also considered individually, as to compare the results throughout project implementation. These findings reveal the efficacy of the intervention and its impact on perioperative nurse handoff.

SAQ.

Pretest. The SAQ pretests were analyzed with an independent-sample *t* test which revealed statistical significance in four items and four other items that approached significance. Significant items included Ask Questions, Good Job B, Problem Personnel B, and Timely Info B. These findings revealed that OR nurse perceptions were

significantly lower in these items when compared to PACU nurse perceptions, indicating that OR nurses have less positive perceptions for all these items in regards to patient safety. OR nurses may have had less positive perceptions about these items than PACU nurses due to a higher rate of employee turnover and increased interaction with a large number of OR staff. OR nurses work with many other staff members on a daily basis and this could account for their poor perception of these items.

The items that approached significance were Disagreement, Feedback, Supervised, and Working Conditions. These results suggested that OR nurses again had more negative perceptions of these items when compared to PACU nurses, although these results only approached significance. This may be related to the high level of interaction with other staff including scrub techs, anesthesia, other perioperative nurses, and others. PACU nurses interact primarily with their patients and a limited number of assigned staff. As OR nurses interact with many personnel, it is reasonable that OR nurses might have poorer perceptions on these items as their work environment is subject to a high rate of variability. A second consideration is the short duration of the project, as these data may not reflect the true perceptions of perioperative nurses. Low scores in the OR may also have been influenced by other recent changes taking place at the time of the EBP project, such as multiple management staff changes and alteration of time-out practices, or the small sample size.

Posttest. The SAQ posttests were analyzed with an independent-sample *t* test which revealed statistical significance in eight items. These items included Family, Daily Efforts B, Compromise Patient Safety B, Good Job B, Problem Personnel B, Timely Info

B, Level of Staffing, and Communication Breakdowns. All eight of these statistically significant items showed that OR nurses scored them higher or more positively than PACU nurses, indicating that OR nurses perceived higher safety scores on the items. This finding is interesting because when compared to the pretests, the significant items were always scored higher in the PACU. The reader will note that five of these items end in “B” {Daily Efforts B, Compromise Patient Safety B, Good Job B, Problem Personnel B, and Timely Info B}, indicating that perioperative nurses scored these items twice on both the pretest and posttest. Items ending in “A” were scored for staff and items ending in “B” were scored for management. The Level of Staffing and Communication Breakdowns items are also associated with leadership roles. It is likely that these seven items scored higher in the OR SAQ posttest because of the change in management experienced in the department during the EBP project.

Only the three items Good Job B, Timely Info B, and Problem Personnel B were significant in both the pretest and the posttest and all three essentially reversed scores in the departments, shifting from negative to positive. It is unknown why this change in scores occurred, but variations in the scores may have been related to other changes occurring in the departments at the time of the project such as new staff or relocating both departments. It must also be considered that the project was short in duration. The “B” at the end of these three items indicates that the perioperative nurses rated these items for management. During the project the manager left the organization, and it is possible that the perioperative nurses perceived the change in management as a positive event.

Matched. When the SAQ pretests and posttests were matched with a paired-samples *t* test, one item showed statistical significance and this was the Support item which meant that perioperative nurses perceived they had less support on the posttest. Only one other item approached significance and this was the Suggestions item meaning that perioperative nurses believed their suggestions were more likely to be considered at the time of the posttest. These two items revealed that before the SBAR Handoff form intervention, the perioperative staff believed they had more support, and after the intervention they perceived their suggestions were more considered. Ultimately, perioperative nurse perceptions of teamwork and patient safety were unchanged. Changes in both these items may be attributed to the shift in management, but it is difficult to determine the ultimate cause for the perioperative nurses' altered in perceptions.

These scores on the SAQ might have been influenced by changes in management, change in handoff procedure, or other unknown factors. The literature review revealed studies that showed increased nurse perceptions of teamwork (Joy et al., 2011), satisfaction (Petrovic et al., 2014; Riesenberg et al., 2010) and patient safety due to increased communication accuracy (Greenberg et al., 2007; Nagpal et al., 2012; Petrovic et al., 2014; Riesenberg et al., 2010). Based on results from past studies, it was expected that posttest SAQ scores would have improved in both the teamwork and patient safety items. However, in this EBP project, teamwork and safety scores on the SAQ did not significantly differ in the perioperative nurses from the pretest to the posttest.

Handoff Evaluation Forms.

Phase one. The mean for total scores on the Handoff Evaluation form was calculated for each department during each phase. During phase one, the scores in the OR were higher than in the PACU. This finding may be due to nurses using the self-report form incorrectly or nurses demonstrating adoption of the learning process associated with early stages of change in the EBP project because it was being measured- such as the Hawthorne effect. This phase was intended to set a baseline for current perioperative nurse handoff practice and it is reasonable to expect nurses to be unfamiliar with the Handoff Evaluation form. As the OR nurses were not yet using a mnemonic phrase to standardize handoff, the difference between reported items by PACU and OR nurses may be related to poor nurse memory (Holly & Poletick, 2013; Kalkman, 2010; Riesenberg, Leitzsch & Little, 2009). Had the perioperative nurses been using the mnemonic phrase and participating in a standardized handoff protocol, the inclusion and exclusion of handoff items would have been more apparent and the Handoff Evaluation forms more accurately filled out.

A paired-samples *t* test was used to analyze the Handoff Evaluation forms in phase one and three items showed significance including NPO Status, Skin, and Shift. These results indicated the OR nurses underreported their inclusion of these items during handoff, as the PACU nurses report they received them. Six other items approached significance in the paired-samples *t* test and included History, DNR, Blood, Equipment, Family, and Plan. Other than the History item, these results showed that the PACU nurses reported not having received these items during handoff from the OR nurses even though the OR nurses reported their inclusion. As discussed previously, it

is thought that as the OR nurses had not begun using a mnemonic phrase to standardize handoff, the difference between reported items by PACU and OR nurses may be related to poor nurse memory (Holly & Poletick, 2013; Kalkman, 2010; Riesenberg, Leitzsch & Little, 2009).

An independent-sample *t* test was also performed and revealed three significant items including NPO, Skin, and Shift. The results of the significant items indicated that the OR nurses underreported three of the items on their forms as the PACU reported to have received the items in handoff. Thus, the same three items {NPO, Skin, and Shift} tested with paired *t* tests and those tested with independent *t* tests showed the same pattern. Six other items approached significance and these included: History, DNR, Blood, Equipment, Family, and Plan. Again these findings matched the paired testing. These findings indicated that except for the History item, all items that approached significance were reported as being received during by PACU nurses when compared to OR nurses who reported not giving the items during handoff. The same pattern of findings between paired and independent data indicates that: (a) perioperative nurses were not filling out their respective self-report forms correctly; (b) perioperative nurses used the self-report forms correctly, but did not accurately relay handoff content; or (c) the self-report forms were not an appropriate measure for perioperative nurses to relay handoff content.

Phase two. During phase two, the total score mean for Handoff Evaluation form in the PACU was calculated and it was higher than the mean in phase one. While PACU nurses reported that they received more items in handoff from OR nurses, the change was not statistically significant. However, the trend of data was in the expected

direction. Based on perception, OR Nurses were providing increased data to the PACU nurses after the intervention leading one to believe the intervention was having a positive effect on perception.

Phase one, two & three. A one-way ANOVA was performed to compare data from the PACU across the three phases. There were no significant differences among the reported variables when comparing the three phases so post hoc testing was not necessary. This seems to indicate the SBAR Handoff form used by the OR nurses did not statistically affect the frequency of reported items during handoff and therefore did not completely standardize handoff items per the intervention form. However, the mean in phase one was 8.14, the mean in phase two was 8.31, and the mean in phase three was 7.57. Thus, the intervention, during the moving phase, did result in an increase of reported items when support was provided by the project leader. However, once reminders were no longer included, the phase three rate fell even lower than the baseline rate, in the refreezing phase. Frequencies were also run on each individual item in the Handoff Evaluation forms, and while several items (Allergies, NPO, Labs, Antibiotics, Dressings, Additional, and Abnormal) showed interesting trends, there were no significant differences among the variables in the three phases of this EBP project. However, the trends indicated that for practice a standardized protocol for handoff is indeed appropriate, as inclusion of these items may not be appropriate for every patient or every procedure. Perioperative nurses should report these items when appropriate and understand the rationale of when to include these items during handoff.

Overall, the intervention in this project did not support lasting change in reported handoff items needed to standardize the content of handoff. This may be due to a poor

climate for change (Burns, 2004), poor baseline teamwork and satisfaction SAQ scores (Joy et al., 2011; Petrovic et al., 2014; Riesenberg et al., 2010), the format of the form (Abraham et al., 2014; Holly & Poletick, 2013; Riesenberg et al., 2010), and the short implementation time for changing nurse practice behaviors (Burns, 2004).

SBAR Handoff Forms.

Phase two. During this phase the OR nurses began using the SBAR Handoff forms and mean scores were calculated. Phase two data were compared to phase three data using an independent-samples *t* test and results showed one significant item. The Implants item from phase two was significantly higher than phase three, indicating inclusion of the item in handoff decreased during handoff from phase two to phase three. While the item was significant, it is important to note that this item may not be appropriate for every patient or procedure and thus the types of surgery scheduled during this phase of the project could have affected the rates.

In addition, three other items approached significance from phase two to phase three and included NPO, DNR, and Device. All three items increased in frequency from phase two to phase three, indicating use of the SBAR Handoff form helped OR nurses include these items during handoff. The results of these tests do not support evidence found in the literature review supporting a mnemonic phrase being helpful in standardizing report. However, all three items do relate to safety concerns for patients. Thus, having an increased reporting of these items may lead to less safety issues for patients.

The implementation of a mnemonic phrase SBAR during handoff should have decreased the incidence of missed or incorrect information transfer (Greenberg et al.,

2007; Holly & Poletick, 2013; Nagpal et al., 2012; Petrovic et al., 2014; Riesenberg et al., 2010). As handoff was not previously standardized and there was little change in reported items from phase two and three, it is thought that either the format or perioperative nurse use of the SBAR Handoff form was sub-optimal. As there is limited research on specific mnemonic phrases, it is difficult to say which factor is more likely a plausible conclusion (Nagpal et al., 2012; Seifert 2012). It is important to recall that the SBAR mnemonic was chosen as it was considered effective and common among nurses (Holly & Poletick, 2013; Seifert, 2012). The items included on the SBAR Handoff form were chosen based on AORN's Handoff Toolkit and the Joint Commission's recommendations (AORN, 2012; The Joint Commission, 2015). These items are considered important to the perioperative nurse's care and should be included in handoff in order to preserve patient safety (AORN, 2012; The Joint Commission, 2015).

Phase three. The mean scores for the SBAR Handoff form were evaluated in the OR nurses and the overall mean was also calculated. These data suggested that OR nurses reported fewer items in phase three when compared to phase two, which may be due to project fatigue or simply poor compliance with the SBAR Handoff form. As previously discussed, the lack of improved handoff items suggest the mnemonic phrase was sub-optimal or the use of a written format was inappropriate. Studies investigating these factors have recommended more research be conducted, as no one mnemonic phrase (Nagpal et al., 2012; Seifert 2012) or format (Abraham et al, 2014; Riesenberg et al., 2010) has been determined superior to the others.

Frequencies run on the individual items also revealed some interesting trends in items that were not significant on in the independent-samples *t* test. Allergies, Implants,

Drain/Catheter, Equipment, Medication, and Device were reported at an increased frequency from phase two to phase three. History, Labs, Location, Laterality, and Device all decreased in frequency from phase two to phase three. These items may have varied in frequency due to the variety of patients and applicability of the item to each individual patient seen during the EBP project. It is also possible that because the SBAR handoff form was a self-report tool, the OR nurses were not accurate in reporting items included in handoff.

MIDAS Report Audit.

An audit of MIDAS risk reports was performed to identify any changes in the number of risk reports related to nurse communication and patient safety. During the four weeks the SBAR Handoff written report form was in use, only one MIDAS report was filed and it was in regards to PACU nurse and physician communication. There were no reports filed during the month before the intervention utilized by the EBP project. These results indicate that there was either no change in risks to patient safety or events which might have occurred were not properly reported through the MIDAS system.

Evaluation of the Theoretical Framework

The theoretical framework chosen to guide this EBP project was Lewin's Model of Change, a three step model for organizational change. This theory uses three steps to implement a lasting change and the first step, unfreezing, allows an old behavior to be unlearnt so that a new behavior can be adopted. The second step, moving, implies the group learns a new behavior and step three, freezing, required that the change becomes part of the group's behavior so that it becomes a lasting change.

The theory was a good for this project, as it dealt primarily with change and complimented the three phases of the project where a new behavior was introduced, learned, and monitored. Strengths of the theory included the steps for change, acknowledgement of forces acting on the group, and its application to problems within a system. The steps for change clearly guided the structure for the EBP project and provided a clear strategy to implement change. The acknowledgement of forces acting on a group was not evident, as there were no recommendations how to manage these forces. This theory was easily applicable to implementing change within a system, although this might be attributed to the steps for change.

The weaknesses of this theory include its simplicity, that it ignored politics and power, and that it advocated top-down change. While the simplicity was not a problem for this EBP project, the fact that politics and power were not considered by the theory was evident within the project. Perioperative nurses with many years of experience seemed reluctant to begin a new practice and a change in management during implementation resulted in decreased sample sizes, as this affected perceptions about the need to participate in the project. The top-down weakness was also evident during the implementation of the EBP project as perioperative staff were reluctant to participate in a colleague's project and this was reflected in a small sample.

This theory was a good fit for this project as the goal was to implement a change of practice in perioperative nurses. The steps were simple and easy to follow, however there were no recommendations how to combat hesitant participants and ensure lasting change. It was also difficult to navigate the project when there was a lack of power behind implementation as a result of a change in management.

Evaluation of the EBP Framework

The Iowa Model of Evidence-Based Practice was ideal for this project, as it uses six structured steps to answer a clinical question: (a) identify a practice question; (b) determine if the topic is a priority; (c) formulate a team to do an evidence search, critique, and synthesis; (d) appraise the evidence; (e) pilot a change; and (f) evaluate the change. This model focused on evidence and is useful for implementing change within a system. Strengths of this model included that it is easily applicable in many areas of practice, provides six structured steps, and is simple to implement. These steps are clearly used in the beginning of this EBP project during the PICOT question formation, literature search, and evidence appraisal. The Iowa Model was certainly easy to follow and was quite applicable to the unique environment of the PACU. The focus on gathering evidence helped to provide a need for the project when proposing the project to management and seeking IRB approval.

Limitations of the model include that there is a lack of structure beyond collection of evidence and that the theory was too focused on finding and appraising evidence, as this might limit its use in making new discoveries. The lack of structure was apparent after completion of evidence collection and raised some concern when planning implementation of the proposed intervention. This concern was combatted by choosing a theoretical framework which provided guidance for this portion of the project. As this EBP project did not seek to generate new knowledge but to implement current evidence-based practice, the second limitation of the Iowa Model was not a limiting factor.

During the project there were no modifications made regarding the implementation or intervention. If the project were repeated, it is suggested that simplifying the implementation to monitor a smaller number of handoff items would improve nurse compliance by shortening the handoff forms. It is also suggested that increasing the duration of data collection in order to increase the sample and make data analysis more reliable.

Strengths & Weaknesses of the EBP Project

Strengths for this EBP project include the use of the Iowa Model of Evidence-Based Practice and Lewin's Model of Change. These frameworks together provided a sound structure for formulating the clinical question, gathering evidence, and project implementation. The EBP project, while in a unique environment, was founded on evidence and an intervention was chosen based on current research. The implementation of the project was based on Lewin's Model for change and the three phases reflect his three steps for lasting change.

Weaknesses for this EBP project include limitations of the department chosen for implementation and a limited sample size. The department chosen for implementation suffered from undergoing a variety of other new changes at the time of this EBP project, adding to the workload of a busy staff. The unit was further altered by a sudden change in management during project implementation so that staff believed participation in these changes was no longer necessary. This unstable environment served in limiting the sample size and reducing the amount of eligible data that could be utilized in statistical analysis. It should also be noted that it was difficult to direct a lasting change as the project leader was considered a colleague among the perioperative nurses, and

this relationship served to undercut any authority that may have otherwise been associated with the role. It is recommended that if this project is repeated in the future, the project leader should not be closely tied to the perioperative nurses in order to preserve the role's integrity. Another limitation of the EBP project was the lack of time to implement Lewin's change model, as only two weeks were allotted for each phase of the model. In order to complete a change involving staff members, months are needed for each phase of the model (Burns, 2004). Thus if this project were repeated, additional time would be needed for moving and refreezing stages. This increased time would also allow the development of interventions to combat the environmental influences that interfered with the change process.

Implications for the Future

Practice.

The findings in this EBP project indicate that perioperative nurses who participate in transferring patient information during handoff may not benefit from a written SBAR handoff sheet. The data analysis does not support the use of the written SBAR Handoff sheet, as many items did not increase in frequency, suggesting that this intervention did not standardize communication between OR and PACU nurses.

Measures used in this project included the Handoff Evaluation form, filled out by PACU nurses, and the SBAR Handoff form, used by OR nurses, whose items were compared by inclusion during handoff. These forms together revealed the overall communication between PACU and OR nurses. Statistical analysis showed that a minimal number of items significantly improved from the beginning to the end of the project. Results also showed that the overall reported items actually improved during

closer support of the new reporting process (moving) but then decreased slightly in both departments during the last phase of the project (refreezing). These results add support to the idea that any change needs a longer transition time. In order for change to be sustained, support for new practices should go on beyond the short time frame of this project. In addition, any change in practice must receive support of administration over time to assist with sustaining a change.

The manager who was present at the beginning of the project was no longer with the departments at the end of the project. The change in authority was a challenge in maintaining the sample size, as perioperative nurses gave up many changes which the manager had supported. The results of this project were reported to the department director, as the manager had not been replaced. The director's response to the project was that the results were considered useful knowledge pertaining to the departments' handoff practices, but that the lack of significant results did not support further use of the SBAR Handoff form. The lack of support from higher levels of administration further demonstrates the need to have a united front when changes are implemented in practice. The change process needs a champion who can address the challenges and sustain a continued effort to reach a goal realizing that early results may be weak and it is necessary to create interventions that support the change environment.

It is supposed that the mnemonic phrase SBAR in the form of a written handoff form did not work related to the either the paper format or the choice of mnemonic phrase. Currently there is not enough evidence to support one mnemonic phrase or one format (Nagpal et al., 2012; Seifert 2012) of handoff tool over another (Abraham et al,

2014; Riesenberg et al., 2010). The SBAR mnemonic was chosen as it was considered effective and common among nurses (Holly & Poletick, 2013; Seifert, 2012).

Another measure included the SAQ, which served as a pretest and posttest to detect changes in perioperative nurse perceptions of teamwork and patient safety. This data revealed no changes in these categories and highlighted the environmental changes in the OR. When compared to the PACU, the OR reported low scores on eight of the 36 items on the pretest and then high scores on the same eight items on the posttest. It is supposed that the other changes in the OR have contributed to the poor response of the departments to the intervention and also influenced the perioperative nurses' perceptions, as measured by the SAQ.

An audit of MIDAS risk reports, which are risk reports filed by nurses as a trackable quality measure, showed no change in the number of patient events related to nurse communication in the PACU. There were no reports filed before the intervention or after the intervention, supporting the statistical analysis of nurse perceptions of patient safety being unchanged on the posttest SAQ.

Theory.

The findings from this EBP project influence future theory development in that this project, while supported by evidence, did not produce results which reflected past the success of past studies. The Iowa Model provided a successful means to form a PICOT question, find current evidence and appraise the evidence; however it did not provide any structure for project implementation. The lack of structure for project implementation is a primary criticism of the model, despite its strength for building a foundation for any project.

Lewin's Model of change was an appropriate theory to guide implementation recommendations from the evidence. The unfreezing, moving and refreezing steps were directly utilized in the three phases of this project. While the simplicity of the steps is considered a strength, one criticism of them is that they are vague and result in poor identification of other forces which might interfere with the proposed change. Perioperative nurses may have been overwhelmed with change in the unit, making lasting change unlikely according to Lewin's change theory (Burns, 2004). In addition, the timeline for moving and refreezing were extremely short in this EBP project. This theory also emphasizes the influence of forces which act on a group and ultimately determine the group's decision to adopt the change (Burns, 2004). This criticism was certainly true during this project, however the environmental and management changes experienced by the perioperative nurses could not have been prevented.

Future theory development may benefit from finding a means to combine aspects of both these frameworks, so that researchers may benefit by using one theory to direct collection of evidence and implementation of a change.

Research.

The implications for nursing research based on the results of this EBP project include a lack of handoff evidence from the perioperative setting. More research should be conducted in this unique setting in order to determine the best practice for handoff between OR and PACU nurses. Current recommendations from the literature do not recommend a specific mnemonic phrase (Nagpal et al., 2012; Seifert 2012) or handoff tool format (Abraham et al, 2014; Riesenberg et al., 2010). More research should be conducted in both these areas of interest in order to fill this gap in evidence. It is also

astounding how little research has been conducted on nurse handoff in the unique setting of the PACU. In order to make sound patient safety recommendations, additional research should be conducted in this complex setting.

Education.

The education provided to the perioperative nurses during unit meetings consisted of presenting a portion of AORN's Handoff Toolkit. The Handoff Talking Points PowerPoint ® presentation took 10 minutes and the nurses were allowed time to ask questions and afterwards they filled out the SAQ pretest. There was no measure conducted for nurse education retention, but this is perhaps one reason why perioperative nurses did not achieve significant results in statistical testing of the Handoff Evaluation and SBAR Handoff forms. Future repetition of this project may consider adding a measure to evaluate perioperative nurse education efficacy.

There is a need for increased education regarding nurse handoff in the perioperative area of practice in order to reduce risks to patient safety. This is a vulnerable time for patients and it is imperative that nurses transfer patient information quickly and accurately. Perioperative nurses are in need of tools to make this transition efficient and complete, so that the transfer of one patient from the OR to the PACU is safe. This EBP project lacked strong support for the use of a written SBAR Handoff form, but the current evidence supports the use of a standardized tool across a department in order to reduce risks to patient safety. All perioperative nurses should be educated on how to reduce these risks and keep every patient safe.

Conclusion

The outcomes of this EBP project using a written SBAR Handoff form did not support claims from the evidence that a mnemonic phrase and one page sheet would aid to standardize perioperative nurse handoff. Independent *t* tests on the SBAR Handoff forms and Handoff Evaluation forms revealed many items did not increase in frequency and an ANOVA on the Handoff Evaluation forms showed the PACU did not report any changes in handoff items during the duration of the project. There was no significant difference in nurse perceptions regarding teamwork or patient safety between the pretest and posttest SAQ. An audit of MIDAS risk reports showed no change in patient safety events related to perioperative nurse communication.

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BIOGRAPHICAL MATERIAL

Erin graduated from Trinity Christian College in 2011 with a Bachelor of Science in Nursing degree. As the result of a positive clinical experience during her undergraduate schooling, she accepted her first nursing position in the operating room. Since then Erin has worked in several surgical specialties as both a circulator and scrub nurse. After gaining a few years of nursing experience, Erin desired to provide a higher level of patient care in the surgical setting and chose to continue her education in Valparaiso University's DNP program. In the academic setting, Erin explored her interests in nurse communication and the role of surgical nurse practitioners. As part of her coursework, Erin submitted a manuscript for publication which investigated the role of surgical nurse practitioners. She also worked with undergraduate nursing students as a clinical preceptor. Since enrolling in the DNP program, Erin has continued developing her surgical skills as she works to complete her registered nurse first assistant certification. She is a member of the Association of periOperative Registered Nurses and the ANA. Utilizing her skills as a family nurse practitioner and a surgical first assistant, Erin hopes to work to improve care provided to surgical patients both in an office setting and in the operating room.

ACRONYM LIST

ANOVA: Analysis of Variance

AORN: Association of periOperative Registered Nurses

CASP: Critical Appraisal Skills Programme

EMR: Electronic Medical Record

ICU: Intensive Care Unit

ITC: Information Transfer and Communication

OR: Operating Room

ORNAC: Operating Room Nurses Association of Canada

PACU: Post Anesthesia Care Unit

QARI: Qualitative Assessment Review Instrument

RCT: Randomized Control Trial

SAQ: Safety Attitudes Questionnaire

SBAR: Situation Background Assessment Recommendation

TJC: The Joint Commission

UTHSCH: University of Texas Health Science Center at Houston

WHO: World Health Organization

Patient Sticker

Code Number

Appendix A

SBAR Handoff Form

Patient Handoff Form

Shift worked (7-3) (9-5) (11-7) (1-9)

Situation

NPO (Y N) DNR (Y N) *Allergies:

*Surgeon:

*Procedure (R L): *Implants Available Y N

*Antibiotics _____ Time _____

*Position Supine Lithotomy Prone Side Lying (R L) Device: _____

Anesthesia Gen Mac Local Spinal Block: Location _____ Time Out @ _____

Medications (& Blood Products):

Drains: JP_____ Blake_____ Foley_____@_____ Other_____

Location: _____

Dressings

Equipment (i.e. Tourniquet):

Background

History:

Labs:

Assessment

Skin:

Other:

Recommend-ation

Notes:

Communication with Family:

Count:

Raytec

Laps

Blades

Bovie Tips

Hypos

Needles

Other:

Code Number

Appendix B

Handoff Evaluation Form (Patient Sticker Here)

Perioperative Nurse OR to PACU Handoff Evaluation Form

S

Y N (N/A) OR to PACU:

- ❒ ❒ (❒) Patient Name
- ❒ ❒ (❒) Allergies
- ❒ ❒ (❒) NPO Status
- ❒ ❒ (❒) Physician

Please Indicate Shift:

- ❒ **Days (7-3)**
- ❒ **Afternoon (1-9 OR 11-7)**
- ❒ **Evening (1-9)**

B

Y N (N/A) OR to PACU:

- ❒ ❒ (❒) Significant History
- ❒ ❒ (❒) Significant Labs
- ❒ ❒ (❒) Antibiotics PreOp
- ❒ ❒ (❒) DNR
- ❒ ❒ (❒) Religious Needs

Please Indicate Department

- ❒ **OR**
- ❒ **PACU**

A

Y N (N/A) OR to PACU:

- ❒ ❒ (❒) Procedure (R or L)
- ❒ ❒ (❒) Implants used
- ❒ ❒ (❒) Blood Products
- ❒ ❒ (❒) Drains/Catheters
- ❒ ❒ (❒) Dressings
- ❒ ❒ (❒) Motor Activity (neuro)
- ❒ ❒ (❒) Peripheral Circulation Issues
- ❒ ❒ (❒) Positional Issues
- ❒ ❒ (❒) Skin Integrity
- ❒ ❒ (❒) Equipment Needs
- ❒ ❒ (❒) Additional Issues & Concerns
- ❒ ❒ (❒) Communication with Family: Condition & Changes

R

Y N (N/A) OR to PACU:

- ❒ ❒ (❒) Additional Questions/Comments:
- ❒ ❒ (❒) Abnormal Results and Related:
- ❒ ❒ (❒) Plan For Continuing Care Interventions:

OR Patient Handoff Evaluation Data Collection Form

Code Number																														
Patient Name	Y																													
	N																													
Allergies	Y																													
	N																													
NPO Status	Y																													
	N																													
Physician	Y																													
	N																													
Significant History	Y																													
	N																													
Significant Labs	Y																													
	N																													
Antibiotics PreOp	Y																													
	N																													
DNR	Y																													
	N																													
Religious Needs	Y																													
	N																													
Procedure (R/L)	Y																													
	N																													
Implants used	Y																													
	N																													
Blood Products	Y																													
	N																													

OR Patient Handoff Evaluation Data Collection Form

Code Number																														
Drains/ Catheters	Y																													
	N																													
Dressings	Y																													
	N																													
Motor Activity (neuro)	Y																													
	N																													
Peripheral Circ. Issue	Y																													
	N																													
Positional Issues	Y																													
	N																													
Skin Integrity	Y																													
	N																													
Equipment Needs	Y																													
	N																													
Additional Issues	Y																													
	N																													
Family Communication	Y																													
	N																													
Additional Questions	Y																													
	N																													
Abnormal Results	Y																													
	N																													
Care Plan	Y																													
	N																													

PACU Patient Handoff Evaluation Data Collection Form

Code Number																														
Patient Name	Y																													
	N																													
Allergies	Y																													
	N																													
NPO Status	Y																													
	N																													
Physician	Y																													
	N																													
Significant History	Y																													
	N																													
Significant Labs	Y																													
	N																													
Antibiotics PreOp	Y																													
	N																													
DNR	Y																													
	N																													
Religious Needs	Y																													
	N																													
Procedure (R/L)	Y																													
	N																													
Implants used	Y																													
	N																													
Blood Products	Y																													
	N																													

PACU Patient Handoff Evaluation Data Collection Form

Code Number																													
Drains/ Catheters	Y																												
	N																												
Dressings	Y																												
	N																												
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Peripheral Circ. Issue	Y																												
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Skin Integrity	Y																												
	N																												
Equipment Needs	Y																												
	N																												
Additional Issues	Y																												
	N																												
Family Communication	Y																												
	N																												
Additional Questions	Y																												
	N																												
Abnormal Results	Y																												
	N																												
Care Plan	Y																												
	N																												

Appendix C

Safety Attitudes Questionnaire Scoring Key and Short Form

SAQ Short Form Scale Items:

Teamwork Climate Items 1 – 6

Safety Climate Items 7 – 13

Job Satisfaction Items 15 – 19

Stress Recognition Items 20 – 23

Perceptions of Management
Items 24 – 29 (each of these items is measured at *two* levels – unit and hospital)

Working Conditions Items 30 – 32

Please NOTE:

- Items 14 and 33-36 are not part of the scales above.
- Items 2, 11, and 36 are REVERSE SCORED.

To calculate the 100pt scale score (e.g., teamwork climate) for an individual respondent:

1) **Reverse score all negatively worded items – see table below for list of reverse scored items.**
2) **Calculate the mean of the set of items from the scale 3) Subtract 1 from the mean 4) Multiply the result by 25.**

The equation looks like this:

Teamwork Climate Scale Score for a Respondent = (((Mean of the teamwork items)-1) * 25)

In order to calculate the percent of respondents who are positive (i.e., percent agreement), you would look at the percent of respondents who got a scale score of 75 or higher. A score of 75 on the scale score indicates the same thing as “agree slightly” on the original 5 point Likert scale (1=Disagree Strongly, 2=Disagree Slightly, 3=Neutral, 4=Agree Slightly, 5=Agree Strongly).

With the conversion to the 100 point scale:

1=0	4=75
2=25	5=100
3=50	

SAQ Item Descriptives used for Benchmarking across 203 administrations

Teamwork Climate	**Is item reverse scored?**	**% Item Missing Data**	**Mean (SD)**	**% Agree (Min Agree-Max Agree)**	**% Disagree (Min Disagree-Max Disagree)**	**Skewness**	**Kurtosis**
It is easy for personnel in this ICU to ask questions when there is something that they do not understand.	**No**	**1.4**	4.17 (.96)	81.31 (41.67-100.00)	7.39 (.00-35.00)	-1.216	1.115
I have the support I need from other personnel to care for patients.	**No**	**2.2**	3.97 (.99)	74.27 (33.33-98.04)	9.13 (.00-42.86)	-.907	.399
Nurse input is well received in this ICU.	**No**	**1.6**	3.98 (1.05)	73.36 (23.94-100.00)	10.15 (.00-54.93)	-.955	.335
In this ICU, it is difficult to speak up if I perceive a problem with patient care.	**Yes**	**2.0**	2.40 (1.21)	21.77 (.00-50.00)	59.86 (9.09-100.00)	.528	-.752
Disagreements in this ICU are resolved appropriately (i.e., not *who* is right, but *what* is best for the patient)	**No**	**1.7**	3.53 (1.10)	56.93 (22.73-85.19)	17.73 (.00-55.07)	-.549	-.345
The physicians and nurses here work together as a well-coordinated team.	**No**	**1.6**	3.78 (1.07)	68.41 (25.71-97.83)	14.24 (.00-52.17)	-.781	-.031
Safety Climate							
The culture in this ICU makes it easy to learn from the errors of others.	**No**	**1.8**	3.95 (1.01)	71.96 (33.33-100.00)	9.51 (.00-33.33)	-.837	.171
Medical errors are handled appropriately in this ICU.	**No**	**2.2**	3.45 (1.06)	51.05 (14.29-91.67)	17.22 (.00-57.14)	-.404	-.342
I know the proper channels to direct questions regarding patient safety in this ICU.	**No**	**1.6**	3.83 (1.01)	64.44 (24.00-100.00)	9.46 (.00-38.10)	-.601	-.171
I am encouraged by my colleagues to report any patient safety concerns I may have	**No**	**1.4**	4.08 (.94)	78.33 (47.62-100.00)	7.13 (.00-26.32)	-1.011	.742
I receive appropriate feedback about my performance.	**No**	**0.9**	3.20 (1.23)	46.40 (4.55-76.60)	30.53 (.00-76.00)	-.256	-.945
I would feel safe being treated here as a patient.	**No**	**1.2**	4.05 (1.04)	74.96 (36.36-100.00)	9.46 (.00-41.67)	-1.024	.424

In this ICU, it is difficult to discuss errors.	**Yes**	**1.6**	2.53 (1.13)	20.11 (.00-46.15)	52.38 (20.83-91.67)	.373	-.628
Job Satisfaction							
This hospital is a good place to work.	**No**	**0.9**	3.73 (1.08)	63.42 (4.55-100.00)	13.44 (.00-59.09)	-.673	-.154
I am proud to work at this hospital.	**No**	**0.8**	3.78 (1.07)	62.44 (16.00-100.00)	10.91 (.00-50.00)	-.636	-.158
Working in this hospital is like being part of a large family.	**No**	**0.5**	3.10 (1.30)	42.08 (.00-93.55)	32.74 (.00-80.00)	-.171	-1.050
Moral in this ICU area is high.	**No**	**1.4**	2.96 (1.25)	38.71 (4.17-83.33)	36.72 (.00-78.26)	-.103	-1.049
I like my job.	**No**	**0.3**	4.37 (.88)	85.30 (61.29-100.00)	4.64 (.00-18.31)	-1.486	1.955
Stress Recognition							
When my workload becomes excessive, my performance is impaired.	**No**	**1.2**	3.83 (1.13)	72.19 (28.57-100.00)	15.11 (.00-53.33)	-.945	.132
I am more likely to make errors in tense or hostile situations.	**No**	**1.2**	3.74 (1.16)	66.92 (30.00-88.00)	16.92 (.00-50.00)	-.777	-.241
Fatigue impairs my performance during emergency situations (e.g., emergency resuscitation, seizure).	**No**	**3.5**	3.00 (1.28)	39.63 (5.88-79.17)	35.84 (12.50-76.47)	-.109	-1.075
I am less effective at work when fatigued.	**No**	**1.1**	3.97 (1.03)	76.97 (37.50-95.83)	10.69 (.00-30.00)	-1.088	.760
Perceptions of Management							
Hospital management does not knowingly compromise the safety of patients.	**No**	**1.9**	3.21 (1.22)	41.05 (9.09-87.18)	27.21 (4.88-90.91)	-.170	-.829
Hospital administration supports my daily efforts.	**No**	**0.8**	2.75 (1.15)	25.10 (.00-93.33)	40.01 (.00-100.00)	.108	-.721
I am provided with adequate, timely information about events in the hospital that might affect my work.	**No**	**1.6**	3.16 (1.09)	41.70 (12.00-74.19)	27.09 (.00-63.64)	-.246	-.636
The levels of staffing in this clinical area are sufficient to handle the number of patients	**No**	**1.7**	2.68 (1.34)	33.37 (.00-85.42)	51.72 (4.17-95.83)	.254	-1.214
Working Conditions							
All the necessary information for diagnostic	**No**	**2.3**	3.56 (1.08)	58.42 (16.67-	18.10 (.00-66.67)	-.498	-.462

and therapeutic decisions is routinely available to me.				89.66)			
This hospital constructively deals with problem physicians and employees.	**No**	**1.7**	2.82 (1.12)	24.91 (.00-83.33)	35.33 (.00-80.00)	.031	-.570
Trainees in my discipline are adequately supervised.	**No**	**2.7**	3.53 (1.17)	57.96 (10.00-100.00)	21.39 (.00-62.50)	-.506	-.649
This hospital does a good job of training new personnel.	**No**	**1.1**	3.54 (1.18)	57.25 (15.71-96.36)	20.41 (.00-61.43)	-.506	-.632

This Table Provides General Descriptive Information at the Item Level (Likert scale: 1=Disagree Strongly, 2=Disagree Slightly, 3=Neutral, 4=Agree Slightly, 5=Agree Strongly): Percent Missing Data; Overall Mean (Standard Deviation); Overall Percent Agree (Minimum Agree-Maximum Agree by clinical area); Overall Percent Disagree (Minimum Disagree-Maximum Disagree by clinical area); Item Skewness; Item Kurtosis

Safety Attitudes: Frontline Perspectives from this Patient Care Area

I work in the (clinical area or patient care area where you typically spend your time): _____ This is in the Department of: _____ Please complete this survey with respect to your experiences in this clinical area.

- Use number 2 pencil only.
- Erase cleanly any mark you wish to change.

Correct Mark ● Incorrect Marks ✓ ✗ ◒ ◔

Please answer the following items with respect to your specific unit or clinical area.
Choose your responses using the scale below:

A	B	C	D	E	X
Disagree Strongly	Disagree Slightly	Neutral	Agree Slightly	Agree Strongly	Not Applicable

Not Applicable
Agree Strongly
Agree Slightly
Neutral
Disagree Slightly
Disagree Strongly

1. Nurse input is well received in this clinical area.	A B C D E X
2. In this clinical area, it is difficult to speak up if I perceive a problem with patient care.	A B C D E X
3. Disagreements in this clinical area are resolved appropriately (i.e., not *who* is right, but *what* is best for the patient).	A B C D E X
4. I have the support I need from other personnel to care for patients.	A B C D E X
5. It is easy for personnel here to ask questions when there is something that they do not understand.	A B C D E X
6. The physicians and nurses here work together as a well-coordinated team.	A B C D E X
7. I would feel safe being treated here as a patient.	A B C D E X
8. Medical errors are handled appropriately in this clinical area.	A B C D E X
9. I know the proper channels to direct questions regarding patient safety in this clinical area.	A B C D E X
10. I receive appropriate feedback about my performance.	A B C D E X
11. In this clinical area, it is difficult to discuss errors.	A B C D E X
12. I am encouraged by my colleagues to report any patient safety concerns I may have.	A B C D E X
13. The culture in this clinical area makes it easy to learn from the errors of others.	A B C D E X
14. My suggestions about safety would be acted upon if I expressed them to management.	A B C D E X
15. I like my job.	A B C D E X
16. Working here is like being part of a large family.	A B C D E X
17. This is a good place to work.	A B C D E X
18. I am proud to work in this clinical area.	A B C D E X
19. Morale in this clinical area is high.	A B C D E X
20. When my workload becomes excessive, my performance is impaired.	A B C D E X
21. I am less effective at work when fatigued.	A B C D E X
22. I am more likely to make errors in tense or hostile situations.	A B C D E X
23. Fatigue impairs my performance during emergency situations (e.g. emergency resuscitation, seizure).	A B C D E X
24. Management supports my daily efforts: Unit Mgt	A B C D E X Hosp Mgt A B C D E X
25. Management doesn't knowingly compromise pt safety: Unit Mgt	A B C D E X Hosp Mgt A B C D E X
26. Management is doing a good job: Unit Mgt	A B C D E X Hosp Mgt A B C D E X
27. Problem personnel are dealt with constructively by our: Unit Mgt	A B C D E X Hosp Mgt A B C D E X
28. I get adequate, timely info about events that might affect my work, from: Unit Mgt	A B C D E X Hosp Mgt A B C D E X
29. The levels of staffing in this clinical area are sufficient to handle the number of patients.	A B C D E X
30. This hospital does a good job of training new personnel.	A B C D E X
31. All the necessary information for diagnostic and therapeutic decisions is routinely available to me.	A B C D E X
32. Trainees in my discipline are adequately supervised.	A B C D E X
33. I experience good collaboration with nurses in this clinical area.	A B C D E X
34. I experience good collaboration with staff physicians in this clinical area.	A B C D E X
35. I experience good collaboration with pharmacists in this clinical area.	A B C D E X
36. Communication breakdowns that lead to delays in delivery of care are common.	A B C D E X

BACKGROUND INFORMATION

Have you completed this survey before? ○ Yes ○ No ○ Don't Know **Today's Date (month/year):** _____

Position: (mark only one)

- ○ Attending/Staff Physician
- ○ Fellow Physician
- ○ Resident Physician
- ○ Physician Assistant/Nurse Practitioner
- ○ Nurse Manager/Charge Nurse
- ○ Registered Nurse
- ○ Pharmacist
- ○ Therapist (RT, PT, OT, Speech)
- ○ Clinical Social Worker
- ○ Dietician/Nutritionist
- ○ Clinical Support (CMA, EMT, Nurses Aide, etc.)
- ○ Technologist/Technician (e.g., Surg., Lab, Rad.)
- ○ Admin Support (Clerk/Secretary/Receptionist)
- ○ Environmental Support (Housekeeper)
- ○ Other Manager (e.g., Clinic Manager)
- ○ Other: _____

Mark your gender: ○ Male ○ Female **Primarily** ○ Adult ○ Peds ○ Both

Years in specialty: ○ Less than 6 months ○ 6 to 11 mo. ○ 1 to 2 yrs ○ 3 to 4 yrs ○ 5 to 10 yrs ○ 11 to 20 yrs ○ 21 or more

Thank you for completing the survey - your time and participation are greatly appreciated.

PLEASE DO NOT WRITE IN THIS AREA

Mark Reflex® forms by Pearson NCS MW263511-1 321 HC99 Printed in U.S.A.

UTHealth
The University of Texas
Health Science Center at Houston

Medical School
University of Texas at Houston-Memorial Hermann
Center for Healthcare Quality and Safety

June 8, 2015

Dear Erin Long,

You have our permission to use any of the following Safety Attitudes Questionnaires and the corresponding scoring keys:

Safety Attitudes Questionnaire – Short Form
Safety Attitudes Questionnaire – Teamwork and Safety Climate
Safety Attitudes Questionnaire – Ambulatory Version
Safety Attitudes Questionnaire – ICU Version
Safety Attitudes Questionnaire – Labor and Delivery Version
Safety Attitudes Questionnaire – Operating Room Version
Safety Attitudes Questionnaire – Pharmacy Version
Safety Climate Survey

Please note, we do not have editable versions for any of the SAQ surveys but feel free to modify the surveys to meet your research endeavors.

Respectfully,

University of Texas at Houston-Memorial Hermann
Center for Healthcare Quality and Safety Team

Appendix D

AORN Handoff Toolkit: Handoff Standardization and Handoff Talking Points

Standardizing Hand offs for Patient Safety

Objectives

- Understand the background to National Patient Safety Goal 2E
- Discuss 3 methods of achieving effective Hand-offs
- State how strategies developed in high reliability organizations (HROs) can be applied to Hand-offs

2

Institute of Medicine Report

- Impact of Error:
  - 44,000–98,000 annual deaths occur as a result of errors
  - Medical errors lead followed by surgical mistakes and complications
  - More Americans die from medical errors than from breast cancer, AIDS, or car accidents
  - 7% of hospital patients experience a serious medication error

Federal Action

By 5 years:

↓ medical errors by 50%,

↓nosocomial by 90%,

and eliminate "never-events" (e.g., wrong-site surgery)

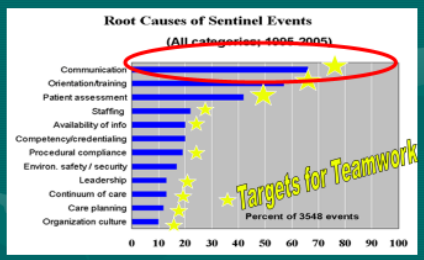
3

Institute of Medicine Report

Cost associated with medical errors is $8–29 billion annually.

4

Communication Issues Leading Factor in Root Causes



Collation of sentinel event-related data reported to The Joint Commission (1995-2005). Available http://www.jointcommission.org/SentinelEvents/Statistics/

5

Joint Commission National Patient Safety Goal-2E

- Implement a standardized approach to "hand-off" communications including an opportunity to ask and respond to questions.

6

Joint Commission National Patient Safety Goal-2E

Implementation Expectations:

- Interactive communications allowing the opportunity to
- ask or respond to questions
- Include up to day information regarding:
  - Care
  - Treatment
  - Services
  - Condition
  - Recent or anticipated changes

7

Implementation Expectations (cont.):

- Limited interruptions
- Sufficient time allocated
- Process for verification of the information
  - Repeat back
  - Read back
- Receiver reviews relevant historical patient data including:
  - Previous care
  - Previous treatment
  - Previous services

8

Hand off Defined

- The transfer of information (along with authority and responsibility) during transitions in care across the continuum for the purpose of ensuring the continuity and safety of the patient's care.

9

Types of Hand offs

- On call responsibilities
- Critical reports (laboratory and imaging)
- Hospital transfers (home, skilled nursing facility)
- Other transitions in care (ED, radiology, physical therapy)

10

Types of Hand offs (cont.)

- Patient hand-offs
  - Level of care (cross coverage)
- Nursing shift change/break relief
- Physician transferring care
  - OR to PACU

11

Are Surgical Patients at Risk?

- Procedure scheduled (clinician's office)
- Scheduling office
- Pre-procedure assessment
- Admitting department
- Pre operative area/nursing unit

12

Are Surgical Patients at Risk?

- Procedures – invasive/noninvasive
- PACU
- Nursing unit
- Home
- Clinician's office for post procedure evaluation

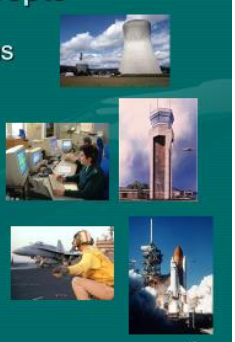
13

Communication During Transitions in Health Care

14

Hand off Concepts

- High Reliability Organizations
  - Nuclear Power
  - NASA and Mission Control
  - Aviation: Crew Resource Management
    - Air traffic control
    - Carrier flight deck
  - Dispatch services



15

Barriers to Effective Communication

- Human fallibility
- Complex systems
- Limitations of learning & training
- Continuity gaps
- Negative impact of fatigue
- Time constraints
- Volume of information
- Confidentiality

16

MD – RN Communications

- Differences in:
  - Style of communication
  - Hierarchy is an issue
  - Past experience
  - Level of empowerment
  - Tone of voice
  - Level of respect

17

Recent Research

Evidence-based report

Ineffective handovers can lead to:

- Wrong treatment, delay in Dx., severe adverse events, patient complaints
- Increase H/C costs, length of stay (and more)

System | Culture | Individual

Australian Council for Safety and Quality in Health Care. Clinical hand-over and Patient Safety Literature Review Report; March 2005. Available http://www.safetyandquality.org/clinhovrlitrev.pdf

18

Recent Research

"How to Study 'Hard-to-see-things':
Shift Change in the Emergency Department"

- Poorly studied, despite importance
- Shift change as a source of Failure
- Shift change as a source of Recovery

Wears R, Roth E, Patterson E, Perry S, "Shift Change Signovers as a Double-Edged Sword: Technical Work Studies in Emergency Medicine", Society for Academic Emergency Medicine, Annual Meeting. New York, NY; May 25 2005. Available http://www.saem.org/meetings/05hand/wears.ppt

19

Recent Research

12 Simulated Patients
5 consecutive handover cycles – 3 different styles

- Verbal handover resulted in loss of *all* data
- Note taking style resulted in loss of 31%
- Form with verbal handover resulted in minimal loss

Pothier, D, Monteiro, P, Mookfar, M, Shaw, A "Pilot study to show the loss of important data in nursing handover", British Journal of Nursing, 2005, vol14, No. 20.

20

Implementation Suggestions

- Assess all points where hand offs occur
- Concurrently monitor process at all points
- Conduct gap analysis
- Identify champions, physicians, nurses, leadership

21

Implementation Suggestions

- Select a consistent approach to hand offs
- Develop a policy and procedure
- Educate staff
- Implement the policy
- Monitor & report findings

22

Why Consistency is Needed

- Complicating factors inhibit consistency
- Differences in styles of communication
- Gender differences
- Cultural background
- Hierarchy of decision making
- Level of respect between physicians and nurses
- Level of empowerment

23

Consistency in Communication

- Focuses on the patient and individual needs
- Reduces impact of complicating factors
- Increases the odds of consistent quality & service to patient
- Requires physicians to become more intentional and disciplined in their interaction with employees
- Requires employees to become more disciplined in their work with physicians

24

Consistency in Communication

- Focuses on the patient and individual needs
- Reduces impact of complicating factors
- Increases the odds of consistent quality & service to patient
- Requires physicians to become more intentional and disciplined in their interaction with employees
- Requires employees to become more disciplined in their work with physicians

24

Assertive Communication is:

- Being organized in thought and communication
- Being competent technically and socially
- Disavowing perfection while looking for clarification/common understanding
- Owned by the entire team – not just a "subordinate" skill set
- It must be valued by the receiver to be successful

26

Assertion Is Not

- Aggressive/hostile,
- Confrontational,
- Ambiguous, or
- Ridiculing

27

Why is Assertion So Hard?

- Hierarchy of decision making
- Lack of common mental model
- Don't want to look "stupid"
- Not sure I'm right
- Culture
- Gender

28

Communication Check List

- Get the person's attention
- Make eye contact, face the person
- Use the person's name
- Express concern
- Use the communication technique (e.g., I-SBAR)
- Re-assert as necessary
- Decision reached
- Escalate if necessary

29

Sample Communication Tools

- I-SBAR
- I PASS THE BATON
- 5 P's

30

I - SBAR

I – introduction

S - ituation (the current issue)

B - ackground (brief, related to the point)

A - ssessment (what you found/think)

R – ecommendation/request (what you want next)

31

Introduction

I

- State your name and unit
- I am calling about (patient name)

32

Situation

S

- Patient age
- Gender
- Pre-op diagnosis
- Procedure
- Mental status pre-procedure
- Patient stable/unstable

33

Background

B

- Pertinent medical history
- Allergies
- Sensory Impairment
- Family location
- Religion/culture
- Interpreter required
- Valuables deposition

34

Background Intraop

B

- Meds given
- Blood given – units available
- Skin integrity
- Musculoskeletal restrictions
- Tubes/drains/catheters
- Dressings/cast/splints
- Counts correct
- Other – lab/path pending

35

Assessment

A

- Vitals
- Isolation required
- Skin
- Risk factors
- Issues I am concerned about

36

Recommendation/Request

R

- Specific care required immediately or soon
- Priority areas
  - Pain control
  - IV pump
  - Family communication

37

I PASS THE BATON

38

I PASS THE BATON

I - Introduction: Introduce yourself

P - Patient: Name: identifiers, age, sex location

A - Assessment: "The problem" procedure etc. so far in the process

S - Situation: Current status/Circumstances, uncertainty, recent changes

S - Safety concerns: Critical lab values/reports; threats, pitfalls and alerts

39

I PASS THE BATON

B - background: Co-morbidities, previous episodes, current meds, family

A - actions: What are the actions to be taken and brief rational

T - Timing: Level of urgency, explicit timing, prioritization of actions

O - Ownership: Who is responsible (person/team) including patient/family

N - Next: What happens next? Anticipated changes? Contingencies

40

Hand off: "5-Ps"

- Ensures proper information is passed during patient transfers or provider shifts change.
- Use the 5 Ps:
  - Patient
  - Plan
  - Purpose
  - Problems
  - Precautions
- After instituting guidelines with the behavior-based expectations, Sentara Health experienced a 21% increase in effective handoffs.

Gary Yates, Sentara Healthcare. Panel 1—Promising Quality Improvement Initiatives: Reports From the Field. AHRQ Summit—Improving Health Care Quality for All Americans: Celebrating Success, Measuring Progress, Moving Forward ; 2004.

41

Issues, Dilemma and Tradeoffs

- Ineffective methods: unstructured, one-way
- Time commitment and process changes required
- Extreme variability and uniqueness of hand offs and transitions
- Lack of focused research on healthcare hand offs

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Spread of Hand-off Tools

- Forms
- Check lists
- IT support – Nursing Notes
- Post hospitalization and Primary Care Provider
- Other ideas:
  - 3 x 5 laminated pocket cards
  - Orientation of new staff (RN, MD, Residents)
  - Stickers on the phone
  - Screen savers
  - Nursing newsletter

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Conclusions

- Transitions in care are a prime target for improved patient safety efforts
- Sentinel event data creates urgency for change
- Strategies developed in high reliability organizations can be applied to health care
- The Joint Commission's National Patient Safety Goals have accelerated the pace of change in applying human factor science to patient care handoffs

44

Questions ?

45

Hand-off Pre-Op ⇨ OR

- Planned surgical Procedure
- Universal Protocol
- Planned anesthesia type
- Allergies
- Last voided
- Preop medications
- Antibiotics to be given
- Significant medical history
- Family contact information
- Equipment needs
- Other issues (e.g., NPO, blood products available)

Courtesy of Tripler Army Medical Center. Adapted from OR Manager, April 2006.

Hand-off OR ⇨ OR

- Procedure
- Surgeon Plan and Preferences (where we are in the case)
- Anesthesia type
- Allergies
- Significant Medical History
- Counts
- Irrigation
- Medications
- Instrumentation on and off field
- Specimens on and off field
- Equipment needs
- Tubes, Lines, Hoses

Courtesy of Tripler Army Medical Center. Adapted from OR Manager, April 2006.

Hand-off OR Team ⇨ PACU

- Surgical procedure (completed vs. planned)
- Anesthesia type
- Estimated Blood Loss
- Input & Output (e.g., straight catheter, foley)
- Allergies
- Medications (received intra-op)
- Significant medical history (e.g., contact precautions)
- Family contact information?
- Equipment needs (e.g., sequential compression devices)
- Other issues (e.g., blood products, anesthesia concerns)

Courtesy of Tripler Army Medical Center. Adapted from OR Manager, April 2006.

Appendix E Code Number

Perioperative Nurse Demographics Form

Please provide the following information:

1) Age _____ **2) Gender** M F

3) Race
African American Asian
Caucasian Indian
Native American Other _____

4) Highest Level of Nursing Education
Diploma/Associates/2 year degree Bachelors/4year degree
Master's/Graduate Degree

5) Current Employment Status
1.0 0.8 0.6 0.4 other

6) Years of Nursing Practice _____

7) Shift Worked Days (7-3) Afternoons (9-5) Evenings (1-9)

8) Length of Shift 8 Hours 10 Hours 12 Hours Longer than 12 Hours

9) Department OR PACU

Perioperative Nurse Demographics Data Collection Form

	Code Number:																												
Age	(years)																												
Race	African American																												
	Asian																												
	Caucasian																												
	Indian																												
	Middle Eastern																												
	Native American																												
	Pacific Islander																												
	Other																												
Gender	M																												
	F																												
Level of Education	ASN/2yr																												
	BSN/4yr																												
	MSN																												
	Other																												
FTE	1.0																												
	0.8																												
	0.6																												
	0.4																												
	other																												

Perioperative Nurse Demographics Data Collection Form

Code Number																														
Years of Practice	(years)																													
Shift Worked	Days (7-3)																													
	Afternoons (9-5 or 11-7)																													
	Evenings (1-9)																													
Length of Shift	8 Hours																													
	10 Hours																													
	12 Hours																													
	> 12 Hours																													
Depart-ment	OR																													
	PACU																													

Appendix F

National Institutes of Health Certification

Protecting Human Subject Research Participants

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Erin Long** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 03/03/2015

Certification Number: 1716036