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Nurse Perceptions of Electronic Handoff

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A Major Paper Presented

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NURSE PERCEPTIONS

OF ELECTRONIC HANDOFF

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Abstract

Nursing handoff is the important exchange of pertinent information between nurses that is critical to patient safety. The purpose of this quality improvement project was to explore progressive care nurses' perceptions of usefulness of a new electronic SBAR handoff tool on an inpatient adult acute care setting at an academic medical center. A 10 question survey including eight Likert response and two open-ended response questions was created from content areas of a survey designed to measure nurses' perceptions of usefulness of a computerized tool for shift handover report writing. The anonymous survey was completed by 16 of 24 eligible participants. Descriptive statistics were performed on the study variables and responses from open-ended questions were analyzed for themes. Survey results revealed that nurses perceive the new handoff summary tool to save time and improve consistency of information exchanged. Nurses stated that communication between departments was not improved and that the summary screen does not accurately represent the patient at the time of report. Open-ended question responses revealed that user error may be contributing to some of the dissatisfaction with the tool. Responses indicated that many nurses still prefer a narrative type of handoff and read physician and nursing assessments for this type of description. Further exploration is needed. Implications for practice include the APRN's important contribution to a successful implementation of electronic handoff. The APRN is essential to the success of such changes as they are uniquely prepared to plan, implement, and evaluate this change across the three spheres of influence.

Table of Contents

Nurse Perceptions of Electronic Handoff

Background/Statement of the Problem

Nursing handoff is the exchange of pertinent patient information from current care nurse to oncoming nurse. Commonly referred to as report, sign-out, or handover, nursing handoff is critically important to patient safety. Inadequate or variable nursing handoff processes can result in care omission, inappropriate treatment, adverse events, increased length of stay, increased health care costs, and wasted time for nurses (Halm, 2014). The Joint Commission identified communication breakdown as one of the main causes of sentinel events in hospitals and began requiring health care organizations to standardize handoff to improve patient safety in 2007. The Joint Commission continues to list improved communication as a national patient safety goal in 2015 (The Joint Commission, 2015).

Verbal handoff communication can be time consuming and lack of standardization of this process may result in missing or incorrect information that can negatively impact patient care. Much of the information presented in verbal handover is documented in the medical record and available for review, suggesting most verbal communication during handover may be unnecessary. Situation Background Assessment Recommendation (SBAR) format promotes focused communication and can increase efficiency of report (Sexton et al., 2004).

Researchers recommend a streamlined electronic handoff tool to standardize information, prevent gaps, and decrease time spent in report. Rapidly changing technology requires nursing processes to change quickly, creating unique challenges for nursing practice today. The difficulty that nurses encounter with fitting patient situations

into a fixed structure handoff tool is well documented. Free text options that allow for narrative style nursing documentation included in standardized electronic tools remain critical for nurses' perceived usefulness of these tools (Oroviogoicoechea, Beortegui, and Asin, 2013). Entirely electronic handoff without any verbal exchange may not allow for complete delivery of information involved in verbal handoff. Nurses continue to use electronic handoff tools only as a reference and rely on verbal exchange as main source of information. Literature on nurse perception of usefulness of electronic handoff tools is limited (Meum, Wangensteen, Soleng, & Wynn, 2011)

Nurses on a 16 bed inpatient adult surgical progressive care unit at Lifespan's Rhode Island Hospital, a 719-bed not for profit academic hospital located in Providence, Rhode Island, received patients from the post anesthesia care unit (PACU) with verbal handoff from the PACU nurse via telephone call. On March 29th, 2015 a new electronic medical record went live organization wide, providing a streamlined electronic handoff process to improve patient flow from PACU to the progressive care unit. With this change, nurses are notified, via a 15 minute warning call from PACU, to look up the arriving patient utilizing the new electronic SBARP (Situation Background Assessment Recommendation Patient) summary screen. This handoff tool is auto populated with information from the patient's electronic medical record and is updated immediately as new information is documented in the record. A free text option exists on the SBARP summary screen to be utilized as needed by any member of the care team. Verbal report is not exchanged before patient arrives to the progressive care unit. Questions may be clarified at the bedside between progressive care unit nurse and PACU nurse when the patient is delivered to the unit.

The purpose of this quality improvement project is to explore progressive care nurses' perception of usefulness of a new electronic SBAR handoff tool. Review of the relevant literature is presented next.

Literature Review

A comprehensive review of relevant literature from 2004-2015 was performed using CINAHL (Cumulative Index to Nursing and Allied Health Literature) and PubMed databases. Keywords used included nursing handoff, handover, report, sign-out, electronic handoff, electronic medical record, handoff tools, and SBAR format. Articles not written in English were excluded.

Nurse Handoff

Nurse handoff is the transfer of care, responsibility, and information between nurses to ensure continuation of successful patient care management. This opportunity to communicate about a patient's state is critical to patient safety and the quality of nursing care provided. Delivery of inaccurate information during handoff can lead to decreased patient satisfaction, increased cost and length of stay, and patient harm (Holly & Poletick, 2013).

Nurses determine what information will be handed off and control the way it is presented (Holly & Poletick, 2013). When determining what is important to provide in handoff, nurses often keep reminders of this information on personalized notes, post-its, and scraps of paper to use during transmission of information. A nurses' decision process for what information is important and how it should be handed off was found to be challenging, unstructured, and informal. The amount and depth of information passed on decreased when the oncoming nurse was familiar with the patient. Inconsistencies in information handed off verbally and information documented in the medical record have been found. Much of the information presented in handoff can be found in the medical

record, but handoff often contained certain relevant information, like family dynamics, that was not available in documentation (Holly & Poletick).

A systematic review explored 29 qualitative studies to determine nurses' experiences during handoff. This review included 21 ethnographic studies, two qualitative descriptive studies, three case studies, one phenomenological study, one appreciative enquiry study, and one action research study. These studies represented over 800 handoffs involving 700 patients and more than 300 participants in 8 countries. One hundred and seventeen findings were organized into 16 categories on the basis of relevance to nurse handoff. After metasynthesis, two evidence based synthesized findings emerged as follows: "individual nurses influence patient care nurse as the gatekeeper of information handed off that is used for subsequent care decisions, and there is an embedded hierarchy in relation to the handing over of information that serves as a method of enculturation into the nursing unit" (Holly & Poletick, 2013, p. 2390).

These findings suggest that the two forms of handoff communication, verbal and electronic, may be necessary to handoff. Verbal handoff offers a personal aspect to the transition of care that may benefit team building and stress reduction, but provide inconsistent information. The results of this review support the need for use of a standard guideline in nurse handoff. The use of a format, such as SBAR, would stimulate information recall for nurses, ensuring that important relevant information is more easily remembered and emphasized during the transition of care. Guided handoff could include a one-page report prepopulated with essential patient information that can be accessed and printed at the time of handoff (Holly & Poletick, 2013).

Murray, McGrath, & Smith (2013) conducted a focus group discussion with eight pediatric emergency room nurses to examine perceptions of clinical handoff and barriers to this process. For this quality improvement project, a qualitative approach was used with a moderator conducting the group interview and a guide to direct the questions. A purposive sample of nurses from all levels of experience in practice were invited to participate. The 90-minute, semi-structured discussion was tape-recorded and utilized an interview guide based on previously published research examining nurses' perceptions of handoff. The first author provided a summary of information collected after the focus group and asked participants to provide anything additional to contribute and to validate the findings.

The authors, using content analysis approach to data interpretation, reviewed the tapes several times searching for crucial phrases. Phrases were transferred to writing and then analyzed using a line-by-line coding approach. Results were organized into themes that were discussed with participants in a follow-up focus group to ensure validity. The first theme reported was nurse to nurse handoff is performed without involvement from anyone else in the healthcare team. Handoff variations were related to preference of nursing giving report and the majority of handoff occurs outside the patient's room. A significant barrier to handoff was found to be interruptions, including parents standing outside of patient's room or not wanting the patient's door closed during handoff. Participants described the need for a more uniform process to limit variability in handoff. Nurses reported that a standardized checklist could help minimize barriers.

Standardization of handoff can provide a more clear and comprehensive picture of the patient and increase safety and quality of care for patients. A concise, organized tool

can help ensure all important information is delivered to the next nurse and minimize distractions. Using the valuable nurse perceptions of handoff gained through this project, the authors planned to implement a standardized process using guidance from the literature. Design and implementation of this process will continue to be influenced by feedback from the focus group participants as research has shown involvement of direct patient care providers positively impacts handoff changes. Limitations of this project included small sample size and the limitations of the methodology utilized. Sample selection bias could have been a factor and participants in focus groups may have altered their responses due to other opinions present in the group (Murray et al., 2013).

Verbal Handoff

Sexton et al. (2004) observed and audiotaped handoffs to examine the content of verbal nursing report compared to information documented in the medical record. Redundancy was of particular interest as the researchers sought to explore how much of the information in handoff was already documented and accessible to the nurse in the electronic medical record. Twenty-three handovers, covering all shifts, were studied on a 30 bed medical unit in a 200 bed acute care facility. These handoffs were conducted with one care nurse providing report verbally to all oncoming nurses together. Qualitative data analysis was performed on the audiotaped and observation data and themes emerged. The researchers found that formal sources of patient information were used in only one report observed. The nurses recorded notes during handoff and throughout the shift on a paper list of patients that was used to facilitate handover at the end of the shift. Data were analyzed in two ways to quantify the information. First, character counts were conducted of the information coded to determine the amount of speech in each category. Through

this analysis, the authors found that 69.5% (n=23) of information could be incorporated into the existing documentation and 15.2% (n=23) of all information exchanged was determined to be irrelevant to patient care. The second analysis counted the number of passages, which represented one idea or topic, in each category. This analysis determined that 84.6% (n=23) of verbal handover information could have been delivered through existing documentation and only 5.8% (n=23) of the information delivered that was not available in the medical record was important to patient care.

The authors concluded that most of the information conveyed verbally by nurses in handoff is already documented and available in the record. The authors argued that verbal handover is not critical to consistency of care, but in fact may increase confusion and lack clarification of important information. Due to the handover style in this study that can involve five or more nurses in report at once, multiple nurses may be involved in the same conversation, making themes sometimes difficult to interpret. Authors suspected that the nursing shortage during the study period may have contributed to poor quality of handover as many nurses working an extra off shift may prioritize care to "survive the shift" and neglect long term goals. The authors stressed a need for standardization of handover to improve consistency and decrease length of time spent in report. The coding structure used to analyze the handovers is new and untested and coding this rich speech into categories could have resulted in a loss of context of the speech. The researchers discussed how reference to written documentation during handover could reduce errors and improve consistency (Sexton et al., 2004).

Caruso et al. (2015) conducted 86 audits at a 311-bed academic pediatric hospital in California to determine if a new standardized handoff process would increase transfer

of patient information without prolonging the duration of handoff from the operating room (OR) to post anesthesia care unit (PACU). The handoff information was standardized using the previously studied I-PASS structure: Illness severity; Patient summary; Action list; Situation awareness and contingency planning; and Synthesis that had been adopted hospital-wide. The handoff participants were organized into teams; a surgeon was added to every sending team and PACU nurse was put in charge of the process. Previous handoff included only the circulating nurse and anesthesiologist reporting to the PACU nurse with no one specified as in charge and the content delivery was not structured. Handoff team members were educated about new handoff procedures via presentations and small-group discussions. Goals for the handoff teams after standardization were to minimize incomplete transfer of information, distractions and incomplete teams, as these were found in the research to be the most common barriers to safe handoff.

Goals of the study included increasing the amount of patient information transferred, increasing nurse satisfaction with handoff, and decreasing handoff duration. Forty-one pre-implementation and 45 post-implementation audits were performed by three auditors who listened to the handoff but did not interfere with the process or interact with the participants. Data collection points included duration of handoff, surgical service, providers involved in handoff, number of questions asked, and number of distractions. Information collected was organized into the following categories: patient information; OR nurse information; surgical information; anesthesia information, and other information. Observers used the I-PASS tool to determine if necessary information was transferred. Ten PACU nurses completed an 11-question Likert response

anonymous pre and post satisfaction survey to measure nurse satisfaction with the process.

Findings included a significant increase of information transmitted and increased surgeon presence during handoff with no increase in duration of handoff. Nurse satisfaction survey results included a significant increase in mean total satisfaction scores. Authors acknowledged the standardized format may have improved efficiency of communication and resulted in the findings. Limitations included using three different auditors which could lead to variability of data though these investigators were trained to increase consistency. The Hawthorne effect was not likely to contribute to a significant increase in patient information handed off because investigators were present for pre and post auditing. The nurse satisfaction survey tool was modeled after a previous published survey, but not formally validated and sample size was small (Caruso et al., 2015)

Movement toward Electronic Handoff

Gu, Andersen, Madsen, Itoh, and Siemsen (2012) developed a questionnaire to assess nurse perceptions of patient handoffs in Japanese hospitals. Seventeen items eliciting a response on a 5-point Likert scale were classified into five topics including information transfer, responsibility transfer, management goals, environment, and handoff system. This questionnaire was pre-tested by twelve health care professionals, including physicians and nurses, with revisions made based on feedback and discussion. Finalized surveys were distributed to risk managers at six hospitals and each hospital managed dissemination and collection of surveys. All hospitals were general hospitals of

similar size and two hospitals were located in urban areas, the remaining four were in rural areas.

Participation was voluntary and 1,985 surveys were distributed with 1502 responses, a 76% response rate. After excluding survey responses with 30% or more missing data, 1462 surveys, yielding a 74% final response rate, were utilized. Researchers utilized a Kruskal-Wallis test of significance to examine differences in nurses' view of handoffs. The Wilcoxon signed rank test was applied to compare nurses' perception of differences between unit and shift handoff.

The researchers acknowledged that studies conducted previously in Western countries call for a standardization of handoff including utilization of electronic handoff systems and stress the important of adequate handoff training. This study found Japanese hospital handoff systems to be inadequate. Japanese nurses indicated that responsibility for the patient and information were handed off moderately well and patient safety was a high priority. However, their responses identified handoff efficiency to be low and the entire system to be lacking important aspects. Survey responses demonstrated a discrepancy between care areas about what information is relevant during handoff, indicating a need for standardization between units and departments. Recommendations from the authors include improvements to the handoff system including incorporating an effective design and the use of information technology systems to enhance efficiency and standardization of the process. The authors acknowledged that adequate training for a new process is critical to safety.

Using self- reported responses to a questionnaire, rather than objective data limited this study. Data was collected from only six hospitals that agreed to participate, limiting the ability to generalize these findings to all hospitals in Japan. External validity was undeterminable because health care safety or quality performance data about participants' hospital settings was not collected and correlated to the questionnaire (Gu et al., 2012).

An integrative literature review by Staggers and Blaz (2013) was performed to provide a comprehensive understanding of medical and surgical nursing handoff research in preparation for computerizing handoffs. A search of literature from 1980-March 2011 in CINAHL, PubMed, Cochrane, PsychINFO yielded 247 references. Duplicates and studies with limited relevance were eliminated, leaving 81 utilized for further analysis. Results demonstrated findings from 30 relevant studies, including 20 qualitative, six descriptive, and four experimental.

A consistent definition for handoff was not found as most researchers did not define handoff, but definitions are beginning to come forth. Handoffs were found to be complex, serving many educational, emotional, and social functions. Many studies addressed the important role handoffs play as a ritual, serving psychological and social functions. The importance of face-to-face handoff was clearly emphasized, particularly noting that computerized handoff should supplement handoff, not replace it. Structured, consistent formats were emerging to improve consistency and accuracy of handoff information. Although national standardized handoff formats, like SBAR in the United States, are being utilized, little research exists about the effectiveness of these structures in nursing specific handoffs.

No single handoff method was found to be more efficient or effective than another. Bedside handoff was found to be popular, but evidence did not demonstrate increased effectiveness due to sensitive information transfer in certain specialties. Verbal handoff with a supporting printed form from the electronic medical record was only tested in one nursing study, but showed promising results of increased key information transferred. Despite its importance to successful computerized transition, handoff context has not been addressed until recently. Specific content needed for distinct specialty handoff and cross-unit handoff needs to be defined.

Handoffs are known to be complex activities that have allowed for gaps and omissions in care, compromising patient safety. Handoffs serve multiple functions for nursing and are considered rituals. Many standardized formats are being utilized without established research demonstrating effectiveness. One standardized handoff process recommended for use across all units does not acknowledge unit and patient specific needs. Handoff formats that standardize information in an efficient way, yet are tailored to meet specific unit needs may be more effective. For successful transition to electronic handoff process, pertinent information for handoff needs to be determined through research (Staggers & Blaz, 2013).

Electronic Handoff

Wentworth, Diggins, and Johnson (2012) piloted an electronic handoff tool on a 33 bed progressive care unit and six room cardiac procedure area to determine if a standardized handoff tool could be developed to improve communication and provide safe patient handoff between the areas. The new tool was expected to increase

consistency of handoff, improve staff satisfaction with the process, and save time for nurses. Researchers created a designated handoff work group of leadership, staff nurses, and an information technologist to design and revise the tool as a team. The work group collaborated to determine the information pertinent to handoff and agreed to utilize SBAR format. The tool was revised several times with staff nurse feedback.

The first tool was a paper handoff that was piloted for six weeks to determine usability and compliance of users. Poor compliance with the paper handoff tool led to a collaborative decision to develop an electronic tool to further increase accuracy of information, usability, and efficiency. To gather information about routine patients before arrival to the unit or procedure area, nurses were accessing several different systems in the electronic health record. Non-routine, complex patient information was transferred via verbal communication between nurses.

Goals of the project were to create a comprehensive tool in SBAR format that was immediately usable and provided relevant information. The exact paper tool already developed and used was transferred to electronic form, requiring no additional education for nurses. The tool is able to be viewed electronically and printed for reference. The electronic handoff tool originally populated 45 % of the information, but with improvements made by information technology administration, 80% of the tool auto populated making human data entry minimal and increasing accuracy of information.

The pilot for the electronic handoff tool involved routine patient transfers from the cardiac procedure areas to the progressive care unit that followed the standardized plan of care only. The electronic tool takes 10-15 seconds for nurse to review and save

before preparing to transfer the patient for the receiving nurse to review. To measure effectiveness, researchers used a pre and post implementation survey that was distributed to all nurses on the involved units. A response rate of 37% (n= 138) was achieved with 51 of the 138 eligible nurses responding to the emailed survey. The 6 questions in the survey required responses on a Likert scale and addressed compliance and ease of use, timeliness, perceived value and usefulness, and the ability to ask and respond to questions.

Findings demonstrated that the participants valued the tool, found it to be more efficient than verbal handoff, thought it was a reliable piece of information, and noted that it standardized the handoff process for routine patients. The participating nurses indicated that verbal report is still important for complex patients. Changes to the tool continued after implementation with real-time feedback from users. The survey used in this studied was not tested for validity or reliability. This study was conducted at a large facility in which many resources aided in its success, including an existing electronic medical record, dedicated IT resources, and educational support and suggests that these findings may only be applicable to facilities with similar support means (Wentworth et al., 2012).

Staggers, Clark, Blaz, and Kapsandoy (2012) conducted a qualitative, interpretive descriptive study on five medical-surgical units in a 425-bed tertiary care facility and a 50-bed cancer hospital to explore nurses' information management in regards to handoff. This facility had an electronic handoff tool already in place and researchers explored how this tool was utilized during the handoff process. A purposive sampling procedure excluded nurses with less than six months of experience and produced a group of 26

nurse participants from varying shifts, units, and levels of expertise. The researchers collected data through audio recording and observation of handoff, open-ended interview of nurses, and review of handoff forms. The researchers chose to interview the nurse giving report to focus on the process of preparing and communicating information.

Interviews included the following semi structured open-ended questions. "What do you do to prepare to give report?" "What do you use to give report?" "Describe your report tool." "What features of the EHR do you use during shift report?" "Which do you find helpful, not helpful?" "What other tools do you use to prepare to give report?" After completing interviews with nurses and observing and audio recording 93 handoffs, the dialogue was transcribed and then analyzed with descriptive coding. The researchers coded the data and verified intercoder reliability by assessing samples of two separate researchers coding the same material. Theoretical and axial coding performed during the second coding cycle identified categories and their properties.

The authors found that nurses gave face-to-face verbal handoff while sitting next to the computers with electronic tools on the screen. Nurses often printed an electronic handoff tool or created their own report sheet which served as the primary source of information in information exchange. Even though the electronic handoff form in place was designed with nurses input and computers were available for use, the electronic tool was consistently used simply as a reference to verify critical information and not as a primary source of information for report for all of the participants. Nurses expressed that the computerized tool was too busy, that it did not contain all the information they needed, and that it contained too much information that they did not need. Sixty-five percent (n=26) of participants used their own hand-made paper handoff sheet and 35%

(n=26) used a print out of the electronic handoff tool, but all who used it wrote additional information on the form. Through this study nurses expressed a need to continue to use paper handoff tools because they are portable, easily accessible, and a means to write down important notes and cross off completed tasks throughout the shift. (Staggers et al., 2012).

Nurse perceptions of electronic handoff tool

Meum et al. (2011) designed a questionnaire for nursing staff on a 14 bed Psychogeriatric Ward in Norway to explore their attitudes and perceptions related to a new electronic handover routine. Nurses were previously handing off patients in a group verbal report session and changed to reading the electronic care plans only for report. The questionnaire, inspired by the Technology Acceptance Model (TAM), was designed to understand perceived usefulness and ease of use. The TAM theory demonstrates a clear correlation between perceived usefulness and intention to use/actual use. Some questions were adapted from TAM questionnaires and others were created specifically to meet the needs of the study. Editing and evaluating the tool was performed several times with a team of nursing staff, physicians, and other clinical staff for the purposes of validity.

Thirty-two out of 34 members of the nursing staff responded. Seventy five percent (n=32) were satisfied or very satisfied with the electronic report, but only 37.5% (n = 32) stated they could rely on this information alone and 93.5% (n=32) responded that narrative information was still important. The study found that although most nurses were satisfied with the new tool, more guidance is needed for some staff to make a

successful transition to a completely electronic handoff routine. The authors recognize the described limits of electronic handoff in terms of clinical judgment and correlate this to the surveyed nursing staff's lack of trust for the electronic information alone. This study only included the perceptions of one ward and was limited by a relatively small sample size, although there was a high response rate. (Meum et al., 2011).

Oroviogoicoechea et al. (2013) surveyed 82 medical-surgical nurses to evaluate their perceptions of a new standardized handoff tool. The electronic tool was initially similar to the paper record with a free text box for nurses to fill in the information they considered important to handoff. This free text box created wide variability and was more important to nurses than the information in the electronic medical record, leading to a greater probability of handing off inaccurate information. The electronic report system was revised to include the most pertinent data in a standardized form determined by a group of nurses with free text option still available. The new handoff tool automatically populated information documented during the shift into the standardized format, increasing functionality for nurses and decreasing the need to input information manually into the free text option.

A questionnaire composed of 20 closed-ended questions requiring a Likert scale response and 2 open-ended questions (Appendix A) was developed by the researchers to explore the nurses' perceptions. The survey was developed from the relevant literature and designed to analyze usefulness of the tool, importance of the content, and the impact on practice. Eighty-two of 121 distributed questionnaires gained responses on surgical, medical, and medical-surgical units. Ninety percent (n = 82) of the nurses surveyed thought the tool was useful, but 30% (n=82) stated it was not used correctly. Nurses

agreed that the tool positively impacted communication with nurses on their unit, nurses on other units, and the medical team. They noted that the tool decreased time spent writing down report, but did not think it would save time in giving handover. Nurses commented most positively about the quality and consistency of the information on the tool, but still thought the free text box was most significant on all units.

Nurses perceived the tool to enhance the quality of information transferred and decrease time needed to write down report. Nurses stated that the tool was useful, but that it was not used correctly, suggesting the need for more effective training on use of the tool and possible need for adaptation of the tool to difference specialties. Interestingly, nurses found the use of a structured format as an advantage to the system, but still thought that the free text option was most useful for information about the patient. This is not surprising as studies have shown that nurses struggle with fitting a patient's situation into a fixed structure. These researchers have adequately examined nurses' perception of a handoff tool, but have not studied this tool's use during handoff. Although the perception was mostly positive, results indicate that further training was needed and if provided, the study may have produced a more accurate perception of usefulness (Oroviogoicoechea et al., 2013).

Next, the theoretical framework is presented.

Theoretical Framework

A social psychologist of the 20th century, Kurt Lewin, developed the force field analysis as a framework for examining the factors that influence a situation. In this theory, a field is seen as a system, which must be completely explored after a change is made to determine its effect. A force's balance is disrupted during change. A force field analysis establishes two forces, the driving forces that encourage movement to a new goal and restraining forces that impede progress toward the outcome. Force field analysis framework forms the foundation of Lewin's 3-stage theory of planned change. For planned change to be effective, driving forces should be identified and emphasized and restraining forces should be minimized. Effective change is described by Lewin as a return to equilibrium resulting from a balance of forces. Identification of these forces could predict when change will be effective (Lewin, 1997).

The first stage, unfreezing, involves preparing for change. This stage includes a change agent identifying a problem and a need for change and then informing others of the need for change. The change agent needs to emphasize the necessity of the change and choose a solution to prepare for the next phase. For planned change to be effective, driving forces should be identified and emphasized and restraining forces should be minimized (Lewin, 1997).

The second stage, movement, involves examining change as a process and recognizing individuals moving to a new way of being. Change, especially in healthcare, can cause feelings of uncertainty and stress in individuals involved, so individuals need encouragement to try out the change. The change agent should move through the change process gradually and thoughtfully, recognizing that change does not happen quickly. For

successful change, resistance should be anticipated. During this phase driving forces should exceed restraining forces. Coaching and guidance during this often challenging phase is required to move individuals to the revised process (Lewin, 1997).

The third stage, refreezing, requires stabilization of the change so that it can sustain. The change agent must neutralize restraining forces that are hindering change and emphasize driving forces to continue to stimulate change. If the change is successfully fixed into practice, equilibrium is restored and the change is effective and will continue as the new standard. This theory can imply that nurses' perceived usefulness with the tool and handoff method are motivation for the success of this tool (Lewin, 1997).

Lewin's theory of planned change considers the process of prepared change and when the described 3-stage process is used correctly, effective change is achieved. This theory is best utilized in stable environments when there is adequate time to create change. Although this theory is one of the oldest in change management, it is efficient and easy to use and understand. These qualities allow this theory to be used often in healthcare, especially in nursing administration and education, and is considered to be most effective when a top-down approach, in which senior leaders drive change, is used (Lewin, 1997).

The method is presented next.

Method

Purpose

The purpose of this quality improvement project was to explore progressive care nurses' perception of usefulness of a new electronic SBAR handoff tool.

Design

This quality improvement project employed a descriptive, exploratory, mixed-method survey of registered nurses using eight questions with a five-point Likert response format and two open-ended questions.

Sample and Site

Participant inclusion criteria included adult progressive care registered nurses who worked any shift on the intermediate surgical care unit at Lifespan's Rhode Island Hospital, a 719-bed not for profit academic hospital located in Providence, Rhode Island. Thirty-seven nurses were employed on this intermediate surgical care unit. Participant exclusion criteria included nurses who were not employed on this unit six months before the electronic medical record go-live date (March 29th 2015) and thus would not have had sufficient experience with previous handoff procedure comparison. Convenience sampling was used.

Procedures

The Chief Nursing Officer (CNO) and the unit's clinical nursing manager provided verbal permission for this quality improvement project. Lifespan and Rhode Island College IRBs determined this project to be not research.

The clinical nursing manager was asked to forward an informational email (Appendix B) to staff and inform staff during meetings about the upcoming survey. A list of all staff members and date of hire to unit was obtained from the clinical manager to determine which staff nurses were eligible to participate.

An informational flyer (Appendix C) explaining the purpose of the project and voluntary participation was posted in the unit break room prior to conducting the survey. An email as sent to eligible nurses along with an informational letter and a link to the anonymous survey on SurveyMonkey in April 2016. Only the surveys completed before April 12th, 2016 were included in the project. Completed survey data were stored electronically on SurveyMonkey and could only be accessed by this investigator. Reponses were not linked to individual participants and thus are de-identified.

Measurement

A 10 question survey (Appendix D) was developed from the content ideas identified in a questionnaire by Oroviogoicoechea et al., (2013) which is illustrated in Appendix A. The survey consisted of eight questions with a five-point Likert response format and two open-ended questions; the Likert responses ranged from 1-5, with 1= strongly disagree and 5= strongly agree. The original questionnaire was designed to measure nurses' perception of usefulness of a computerized tool for shift handover report writing. Content ideas assessed nurses' perception of the tools' purpose of use, importance of content, and impact on practice including reducing time to write report. The content ideas were modified to exclude questions about report writing; the term 'handover' was replaced by the term most used by this nursing staff, 'report'. Two open-

ended questions were added to better understand nurses' perceptions of how this tool could be more useful in this area.

Data Analysis

Basic descriptive statistics was performed on all survey data. Mean scores and percentages were Likert scale survey questions. The open-ended questions were analyzed for patterns and themes.

Next, the results will be presented.

Results

Of the 24 potential participants, 16 completed the survey (66.7%). The participants were asked to respond to 10 questions about the usefulness of an electronic SBARP handoff tool. Table 1 illustrates the survey questions and the number of participants who responded to each response category.

Table 1

Survey Responses (N=16)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Total	Mean Scores
1. The SBARP summary reflects the patient's situation at time of report.	1	9	2	3	1	16	2.63
2. The SBARP summary conveys the most significant information about the patient.	2	2	6	6	0	16	3.00
3. The SBARP summary improves communication between 5ISCU and PACU.	2	9	2	2	1	16	2.44
4. The SBARP summary improves communication within nursing team.	1	5	4	3	3	16	3.13
5. The SBARP summary improves the quality of information in report.	0	4	6	5	1	16	3.19
6. The SBARP summary improves consistency of the information in report.	0	3	5	8	0	16	3.31
7. The SBARP summary improves the quality of report.	1	5	3	6	1	16	3.06
8. The SBARP summary reduces time spent in report	2	1	4	8	1	16	3.31

The actual mean score for the total scale was 3.00 out of 5; the mean score for the participant responses ranged from 2.44-3.31 out of a possible 5.

The highest mean score of 3.31 was related to nurse perception of improved consistency of information (question 6) and reduced time spent in report using the electronic handoff (question 8). A total of 9 nurses, or 56.25% of participants, disagreed that electronic handoff reflects the patient's situation at time of report (question1; mean = 2.63). The lowest mean score of 2.44 was assigned to the question that addressed nurse perception of improved communication between the two departments as a result of electronic handoff (question 3). Next, participants were asked to answer two open-ended questions. The first question asked for nurses' opinion about what information, if any, was missing from the SBARP summary screen. A total of 12 participants answered this question and four did not respond. Table 2 illustrates the responses to this question.

Table 2

Survey Responses: Missing information (N=12)

1.	Intake & Output (blood loss, fluids given, fluid totals)
2.	Date of last bowel movement
3.	Actual surgical procedure performed, rather than anticipated procedure
4.	Correct diagnosis
5.	Specific prior surgeries
6.	Summary of events
7.	Overdue meds
8.	Lines & drains that have not been added

Participant responses were varied and ranged from key data that isn't presented on SBARP summary screen, like date of last bowel movement and overdue medications, to user error resulting in missing information, like the previous nurse not documenting lines or drains that were placed in the operating room and thus are not reflected in the summary. Although the responses were mixed, a common theme emerged when looking at the short answers collectively. Particular pieces of information, like lab data and intake and output, were perceived as missing.

The second open-ended question asked where else nurses look in the chart to gather information about the patient after reading the SBARP summary screen. A total of 11 participants answered this question and five did not respond. Table 3 illustrates the responses to this question.

Table 3

Survey responses: Gathering more information (N=11)

1.	Physician notes, including history and physical exam
2.	Medication administration record
3.	Lab results
4.	Orders, including signed & held orders for different phases of care
5.	Operating room note
6.	Nurse's complex assessment flow sheet

Nurse responses were mixed and ranged from reviewing notes and assessments to specific data like lab results. Results varied, but a common theme emerged. Many participants read notes and assessments about the patient to gather additional data.

Next, summary and conclusions will be presented.

Summary and Conclusions

Nursing handoff, the important exchange of information from current care nurse to oncoming nurse, is crucially important to patient safety. Inadequate communication of the patient situation through variations in nursing handoff can result in adverse events for patients. Verbal handoff can be time consuming and even unnecessary as most information exchanged can be found in the medical record (Sexton et al., 2004). Nurses appreciate accurate information, but have trouble placing patients into a standardized format (Oroviogoicoechea et al., 2013). A preferred handoff method included a face-to-face verbal exchange with the electronic medical record information displayed on a computer screen to verify and supplement the information reported. (Staggers & Blaz, 2013).

As a National Patient Safety goal identified by The Joint Commission, improved communication is a top priority for healthcare facilities. Requiring standardization of handoff to improve patient safety has resulted in many process changes for nursing handoff. The SBAR format promotes streamlined, focused communication of information delivered in the same order every time. Electronic handoff tools offer the advantage of constantly refreshing information about the patient as changes occur and keeping this most up-to-date data organized in a standardized viewing screen (Staggers & Blaz, 2013).

A new electronic medical record was adopted at the study site on March 29th, 2015. In an effort to improve consistency of information, increase safety, and reduce time spent in report, verbal handoff was eliminated. The new report process from PACU to an intermediate surgical care unit was handoff via an electronic SBARP summary

screen tool. The purpose of this project was to explore progressive care nurses' perception of usefulness of the new electronic SBARP handoff tool.

Participants were adult progressive care registered nurses who were employed on the intermediate surgical care unit at Rhode Island Hospital at least six months prior to switching to electronic handoff. Of the eligible 24 participants, 16 completed the survey (66.7%). The nurses were asked to complete a survey using Likert responses to describe their perception of usefulness of the new SBARP summary screen utilized for electronic handoff. Participants rated improved consistency of information and reduced time spent in report as the most significant improvements with electronic handoff (mean=3.31 out of 5). Approximately 56% of nurses (n =16) disagreed that electronic handoff reflected the patient's situation at time of report. Participants identified improved communication between departments as the area least improved by the new handoff method (mean= 2.44 out of 5).

Participants were also asked to describe, in short answer form, what they perceived to be missing from the SBARP summary screen used for handoff. The 12 nurses who responded to this question mostly identified missing data that would normally populate on the SBARP summary screen as missing due to consistent user error. Nurses were asked to identify, in short answer form, what they did to gather additional information needed after reading the SBARP summary screen. Eleven nurses responded to this question and identified the need to read physician notes and nursing assessments about the patient to gather additional data.

Several limitations existed for this project. First, the sample size was limited by the small size of the unit and exclusion criteria prevented new nurses from participating. This sample size may not accurately represent the population of nurses who have undergone a similar process change throughout the entire study site, but it does represent the perception of the nurses on this unit with enough experience to compare the two processes. A second limitation included no collection of demographic data. In an effort to keep survey responses confidential, no identifying information was collected in this small group. Demographic data could have allowed for correlations between years of experience and perception of usefulness of the electronic tool.

In summary, this project revealed that nurses identified that the new handoff summary tool process saved time and improved the consistency of information exchanged, which can likely improve safety and nurse satisfaction with handoff. Nurses identified communication between departments as not improved as a result of this handoff tool. Nurses did not think that the new handoff tool accurately represented the patient at time of report. Interestingly, when asked about what is missing from the electronic handoff screen, most responses included something that exists on the screen, but is not updated by the previous user for viewing. It appeared that user error could be contributing to much of the dissatisfaction with the tool. Further exploration is indicated.

When asked what else nurses do to gather information about their patients, many responded that they look into the notes or nursing assessments. This can be attributed to some nurses having a preference for a more narrative type of handoff to provide information about the patient. Many commented that it is beneficial to have the short narrative filled in on the optional yellow sticky note available on the SBARP summary

screen. Using this available option more frequently, especially for more complicated patients, could reduce frequency of reading notes and nursing assessments. Further evaluation of use of this handoff screen through surveys may be useful to identify where more training is needed to reduce user error and improve satisfaction with the tool. Policy changes and updates to better reflect the process changes that have occurred may be beneficial as well.

Recommendations and implications for advanced nursing practice are presented next.

Recommendations and Implications for Advanced Nursing Practice

Successfully adopting a new electronic medical record requires extensive work from staff and leadership throughout the healthcare system. The Advanced Practice Registered Nurse (APRN), specifically the Clinical Nurse Specialist, is uniquely prepared to facilitate acclimation to a new technology product through the three spheres of influence. Technology transitions can be difficult to coordinate and require the expertise of a CNS leader to tackle technology conversion initiatives and provide leadership and expertise to achieve goals. The success of an EMR is largely dependent on planning, support during implementation, and post implementation evaluation and optimization.

Changes to processes and communication are inevitable with the implementation of a new electronic medical record. Planning for technology conversion involves ensuring that end-users are fully prepared for these process changes. Comprehensive training and rehearsal events for staff before implementation are crucial to patient safety, employee satisfaction and success across the system. During the evaluation phase, performing an assessment of nurse perceptions of a new electronic tool can assist with optimization to ensure end-user satisfaction and optimum use of the product. This evaluation process is crucial to completing the transition and sustaining the change. The CNS is qualified to design, implement, and evaluate process changes like this that can impact patient outcomes.

Advanced Practice Registered Nurses are in an ideal role to assume responsibility for educating staff end-users about new technology. The CNS has the clinical experience and knowledge needed to understand and provide the best training for nursing and other healthcare disciplines around technology conversions. The CNS is able to understand the

complexities of an impact that a new electronic record and handoff method has on the patient, nurse, and system and prepare end-users for resulting practice changes. Through audits and surveys, the APRN is able to identify the need for refreshers or ongoing education that may be necessary for optimal use by most staff.

Quality improvement investigations through staff surveys, documentation audits, and patient experience survey scores and comments can assist the APRN in understanding the success of the new handoff method and areas for further investigation or improvement. Using their clinical background, the APRN is able to fully understand glitches and needs for optimization in the EMR through discussion with end-users, observations, and their own use of the products. The APRN is able to bridge the gap between clinical end-users and IT specialists to optimize new technologies.

The skill set of an APRN makes them adequately prepared to establish a committee to provide feedback about a new handoff tool. Committees lead by APRNs can work to brainstorm ideas about how to improve patient flow, safety and nursing handoff through new technologies. Implementing strategies to improve handoff and supporting nurses through this process can improve patient safety and nurse satisfaction. The APRN is able to actively participate in system initiatives to improve handoff and provide the clinical perspective from the bedside and offer solutions that would benefit the interdisciplinary team. A CNS involved in large system-wide initiatives can provide the perspective from end users and offer creative solutions that create optimal outcomes for patients, nurses and other health care providers, and the system.

Improved handoff is an area for continued research by the APRN. The APRN is optimally prepared for this type of research that requires clinical knowledge and expertise

as well as an understanding of the global picture. Opportunities for future research include comparison of nurse perceptions in other areas of the hospital, including PACU's perspective of handoff. Replicating this project in other departments could be easily accomplished through adjustments to the survey. Establishing what information is pertinent for handoff and if it is variable in different departments needs to be determined through research. Findings from continued research in this area could be utilized by health information technology vendors to enhance new electronic medical record designs before implementation at a facility. Determining pertinent information needed for handoff through research could help produce a more effective design for the product. If research determines certain criteria be tailored to specific unit needs, these items can be incorporated before an institution starts the transition. The APRN would be essential to a technology vendor for anticipating an organization or units' needs in terms of handoff criteria. Information technology companies could benefit from APRNs expertise in this area to reduce potential errors before updates and optimization are completed after an organization has transitioned to the new product. The consistent collaboration between technology vendors and APRNs could transform technology transitions into a smoother and easier process for all.

The Joint Commission continues to state improved effectiveness of communication among caregivers as a national patient safety goal in 2016. Advanced practice nurses across the nation can impact communication breakdown in many ways, including ensuring that end-users are able to utilize new technologies to maximum efficiency. The American Nurses Association believes that electronic health records should be standardized and transferrable among all vendors' products for improved

patient outcomes and increased nursing satisfaction. Nursing involvement in technology product selection and the program design, implementation, and evaluation is believed to be essential to the success of the program (American Nurses Association, 2014). The APRN can be involved in every aspect of product implementation and advocate for including the bedside registered nurse in this process. The APRN can play a key role in ensuring the voices of registered nurses from all departments across an organization are heard and included in decisions as recommended by the American Nurses Association.

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Appendix A

Questionnaire by Oroviogoicoechea et al. (2013)

Items
Purpose of use
It shows the work done.
It reflects the patient's situation at shift handover.
It reflects the patient's development throughout the shift.
It conveys the most significant information the patient.
Importance of the content
Free text
Recommendations
Tests
Fluids
Structured contents
Impact on practice
Improve communication within the nursing team
Improve communication with the medical team
Improve communication between the different units
Improve quality of information in the shift report
Improve consistency of the information
Improve quality of the handover process
Reduce time of the handover
Reduce time to write the report

Appendix B

Informational email to unit manager to be forwarded to all staff.

From: Ashlee Viveiros

To: (INSERT UNIT MANAGER HERE)

Subject: Quality improvement project information, please forward to staff.

Dear Colleagues,

I am a graduate student at Rhode Island College and work at Rhode Island Hospital. I am writing to invite you to participate in a quality improvement project that I am conducting. The purpose of this project is to explore progressive care registered nurses' perception of usefulness of the electronic SBAR summary screen handoff tool for receiving report from the post-anesthesia care unit (PACU). Your participation in this project will provide insight to usefulness of the tool.

You are not eligible to participate in this study if you have not been employed on this unit before October 1st 2014. If you choose to be a participant in this project, you will be asked to complete an online survey via SurveyMonkey, the link to the survey will be provided to you. Completing this survey will take about 5- 10 minutes of your time.

Thank you,

Ashlee Viveiros RN BSN

MSN Student

Rhode Island College

401-808-7782

https://www.surveymonkey.com/r/BTZT57C

Appendix C

Informational Flyer

5ISC Quality Improvement Project Survey

Who is eligible? Registered Nurses employed on 5ISC before October 1st, 2014.

What is the purpose of this project? The purpose of this project is to explore progressive care nurses' perception of usefulness of the electronic SBAR handoff tool.

When does this survey take place? April 2016

Why should I participate? Participation is voluntary; your participation will provide insight to usefulness of the new tool.

How can I participate? If you choose to be a participant in this project, you will be asked to complete an online survey via SurveyMonkey, the link to the survey will be provided to you. Completing this survey will take about 5- 10 minutes of your time.

For more information, contact:

Ashlee Viveiros- 401-808-7782

Rhode Island College MSN Student and Registered Nurse at Rhode Island Hospital

Appendix D

Nurse Perceptions of Electronic Handoff Questionnaire

Answer the following questions in regards to using LifeChart's electronic SBARP summary screen for receiving report from the PACU. Choose the most appropriate response:

(1.Strongly disagree 2.Disagree 3.Neither agree nor disagree 4.Agree 5.Strongly Agree)

1. The SBARP summary reflects the patient's situation at time of report.

2. The SBARP summary conveys the most significant information about the patient.

3. The SBARP summary improves communication between 5ISC and PACU.

4. The SBARP summary improves communication within the nursing team.

5. The SBARP summary improves the quality of information in report.

6. The SBARP summary improves consistency of the information in report.

7. The SBARP summary improves the quality of report.

8. The SBARP summary reduces time spent in report.

9. What information (if any) is missing from the SBARP summary screen? (Free text box)

10. After reading the SBARP summary, what else do you do (if anything) to gather information about the patient? (Free text box)Survey Link: https://www.surveymonkey.com/r/BTZT57C