4-2019

Improving Patient Handover from the Pediatric Emergency Department to the Pediatric Intensive Care Unit

Kathryn DeVinney
Grand Valley State University

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Kathryn DeVinney

Kirkhof College of Nursing

Grand Valley State University

Advisor: Sandra L. Spoelstra, PhD, RN, FGSA, FAAN

Advisory Team: Marie VanderKooi, DNP, RN: Caryn Steenland, MSN, RN

Date of Submission April 22nd, 2019

Abstract

Patient safety can be at risk during registered nurse handover, particularly when transitioning between high risk areas. According to The Joint Commission (2017), a standardized transition process should be implemented during patient handover. The purpose of this paper was to evaluate the effect of a standardized process with a cognitive aid on handover between a pediatric emergency department and an intensive care unit. Objectives of the project were to decrease conversion time in the emergency department, increase standardized process utilization, and improve patient outcomes, registered nurse perception and satisfaction, and patient proxy satisfaction. This evidence-based quality improvement project took place in a free-standing children's hospital, and involved registered nurses (N=168) and patients. The Plan, Do, Study, Act model was utilized to direct change. Outcomes were evaluated using pre- and post-data collected from surveys, report reviews, and organizational reports. Implementation of a standardized process with a cognitive aid had a statistically significant impact on use of the standardized handover process and registered nurse satisfaction without increasing transition time. Sustained increase in compliance with the process was achieved with use of the cognitive aid. Improvement was attributed to multiple, evidence-based, and tailored implementation strategies. Implementation of a cognitive aid within an established workflow and compliance tracking is likely to increase and sustain use of the standardized transition process during patient handover and improve registered nurse satisfaction.

Keywords: handover, handoff, standardize, pediatric, intensive care unit, emergency department, cognitive aid

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Improving Patient Handover from the Pediatric Emergency Department to the Pediatric Intensive Care Unit

Introduction

The Joint Commission (2017) defines handover as the transfer of patient care responsibility from one caregiver or team of caregivers, to another. Handovers are an essential component of the two million pediatric hospitalizations that occur annually in the United States (Leyennaar et al., 2016). Patient handover communication was recognized as a safety concern by The Joint Commission in 2006, the World Health Organization in 2007, and the Institute of Medicine in 2008 (Bigham et al., 2014).

Potential for harm arises when handover information is incomplete, inaccurate, misinterpreted, not relevant, or not communicated in a timely manner (The Joint Commission, 2017). The potential for harm increases when communication breakdown occurs in high risk areas (Eppich, 2015; Reimer, Alfes, Rowe, & Rodriguez-Fox, 2018). Nearly 64% of hospital sentinel events and $1.7 billion in malpractice costs over five years were associated with poor communication (Foronda, VanGraafeiland, & Davidson, 2016; The Joint Commission, 2017).

Between-unit handovers pose additional problems not experienced in handovers that occur within a unit. Challenges include irregular occurrence, interaction between members of different departments, and differing specialties of those involved in the transition (Hilligoss & Cohen, 2013). Due to the risk associated with the patient transition between pediatric emergency departments (PED) and pediatric intensive care units (PICU), the handover process between these departments should be a priority for quality improvement.

Organizational Assessment

An organizational assessment is a tool used with the purpose of producing knowledge regarding an organization's resources, strengths, weaknesses, etc. (Moran, Burson, & Conrad, 2014). Assessment tools guide organizations to work through conceptual ideas, and make decisions regarding the quality improvement process (Moran et al., 2014). The focus of this organizational assessment was the PED and PICU of a Children's hospital (CH) in the Midwest. The purpose of the assessment was to analyze the CHs PED and PICU using the six-box model, a strengths, weaknesses, opportunities, and threats (SWOT) analysis, and registered nurse (RN) surveys. Specific attention was paid to patient transition between the two departments.

Organization Summary

CH had attained Magnet® status and was a nationally ranked children's hospital. CH was also ranked in the pediatric specialties of cancer, cardiology and heart surgery, nephrology, orthopedics, pulmonology, and urology (U.S. News and World Report, 2017). The PED was a 35-bed department that saw over 54,000 children annually. The PED employed 66 RNs and was the only level I pediatric trauma center on the west coast of the state (XXX XXX, 2016). The PICU was a 24-bed unit, with 102 RNs, that cared for critically ill medical and surgical patients. The PICU received planned admissions from surgery and unplanned admissions for other units in CH. The PICU received 530 admissions from PED in 2017 (Virtual Pediatric Systems, 2017).

Key Stakeholders

Key stakeholders are individuals or groups of individuals that influence quality improvement projects or have a special interest in the outcomes of a change (Moran et al., 2014). The purpose of identifying stakeholders was to address resistance to change and gain support from them for a proposed improvement (Moran et al., 2014). There were a number of key

stakeholders in the PED and PICU for the quality improvement project on transitions. They included RNs, charge RNs, and clinical nurse specialists (CNS) in both departments. These three groups of stakeholders played a role in the success of the quality improvement project, and were influenced by the outcomes. Patients and families were also stakeholders who were influenced by the outcomes of the project.

Organizational Assessment Tool: Six-Box Model

Marvin Weisbord developed the Six-box model in 1976. The Six-box model is a diagnostic framework that can be used to assess small or large-scale organizational issues (Weisbord, 1976). Weisbord (1976) identified factors within an organization that play a role in the ability to change and assigned a single "box" to each factor. Factors include the purpose, structure, mechanisms, relationships, and leadership of an organization. According to Weisbord (1976), data to assess these factors can be collected using observation, reviews, interviews, or surveys. Tools, like the Six-box model, are helpful for determining whether an intervention is applicable to a specific organization (Weisbord, 1976).

Components of the Six-Box Model with Assessment

Purpose. The focus of the purpose box was to determine goal clarity and goal agreement (Weisbord, 1976). Goals of patient care differed between the PED and the PICU. The goal of care for the PED was to stabilize patients while the goal of care for the PICU was to provide continued care and healing. Different goals led to a variation in priorities between RNs in the PED and PICU. These contrasting foci, while vital to patient care, caused conflict between the PED and PICU.

Structure. The focus of the structure box was to determine fit between goals and the structures that produce outcomes. It was also important to determine how work was shared and performed (Weisbord, 1976). The structure in place for patient transitions from the PED to inpatient floors was a standardized process, however, it failed to address the unique components of the handover of a critically ill pediatric patient. Just prior to project implementation, a specific standardized process for patient transition from the PED to PICU was established (see Appendix A). A cognitive aid was created for PICU RNs as the new standardized process was implemented (see Appendix B). No cognitive aid was created for PED RNs to use to assist in compliance with the new protocol.

Another vital structure in the CH included the mechanism by which quality improvement occurred. A dedicated workspace and consistent process for improvement existed in the CH. The plan, do, study, act (PDSA) model directed the majority of improvement initiatives. The PDSA model is comprised of four phases that can be used to test a change. The plan phase includes the development of an intervention and organizing its implementation. The do phase includes making the change. The study phase includes observing and studying the change, and the act phase includes analyzing the results and determining future modification needed (Institute for Healthcare Improvement, 2017).

Relationships. The central question of this factor was "How do we manage conflict among people?" (Weisbord, 1976, p. 432). Conflict management strategies include forcing, smoothing, avoiding or suppressing, bargaining, and confronting (Weisbord, 1976). The method for conflict resolution was bargaining and smoothing. This method of resolution included negotiating changes, each department advocating for what is best for itself, and pretending that there are no differences between departments (Weisbord, 1976). A more beneficial method to

prompt resolution was the confronting conflict management strategy. This strategy includes opening up issues and allowing evaluation in both departments (Weisbord, 1976).

Rewards. According to Weisbord (1976), people need to feel rewarded for the work they accomplish. Salaries and benefits for RNs in the PED and PICU acted as rewards, however additional rewards needed to be put place (Weisbord, 1976). One reward system in the PICU was the distribution of "safety bucks". Leadership (e.g., managers, supervisors, etc.) in the PICU observed staff activities, and when staff compliance with policies resulted in sustained patient safety then a "safety buck" was provided. These "safety bucks" could be used to obtain rewards from food to movie tickets. No reward system existed in the PED to reward RNs for compliance or sustained patient safety.

Leadership. Organizational leaders must identify and correct issues, in addition to implement and sustain change (Weisbord, 1976). All leadership in CH could complete this task, however, a CNS position existed in both departments to address process, policy, and patient care issues. Each department also had a shared leadership team where RNs were encouraged to participate in addressing the issues they identified in their work. A plan was needed to successfully address transitions between the PED and the PICU and sustain the change.

Mechanisms. Mechanisms that had proven helpful within organizations included policies, procedures, committees, and information provision (Weisbord, 1976). Policies and procedures existed to support the transition of patients between the PED and PICU, as described in the structure of the organization. However, the policy and procedures needed modification. Mechanisms existed to disseminate information and create a committee. Information regarding the standardized process for patient transition could be distributed through email updates, at RN huddles, or at staff meetings in both the PED and PICU. A committee could be established with

the shared leadership teams in each department to address handovers. Additional mechanisms were needed to facilitate optimal patient transition between the PED and PICU which included a plan to improve the handover and initiate a measurement system to determine outcomes and compliance.

SWOT Analysis

A SWOT analysis was another way to assess an organization. Use of the Six-box model and a SWOT analysis provided a comprehensive picture of the organization and its components. A SWOT includes an analysis of internal strengths and weaknesses, and external opportunities and threats (Moran et al., 2014). To complete the assessment, internal attributes were examined (see Appendix C). External environment influences were also examined along with obstacles and opportunities (Moran et al., 2014).

Strengths. Many strengths existed within the PED and PICU regarding patient transitions. A hospital-wide standardized communication process with a framework was in place for information that should be provided during handover called the SBAR. This was strength as the SBAR addressed many of the handover requirements of The Joint Commission. A cognitive aid was in place in the PICU to enable compliance with the standardized handover process from the PED to the PICU. A cognitive aid was in place in the PED to facilitate necessary steps for transfer of patients to all floors in the CHs, but lacked inclusion of steps specific to the PICU. This was a strength, as the aid was a part of the PED RN workflow prior to this project. The PED secretaries attached the tool to the consent form on the record of each patient admitted from the PED going to an inpatient unit. Another strength was the presence of CNS and a shared leadership team in both departments. This provided a mechanism through which quality improvement could occur.

Weaknesses. Weaknesses that existed concerning the PED and PICU patient transitions included the lack of standardized communication content during handover and an incomplete cognitive aid. The aid lacked information specific to the PICU transition to prompt adherence to the standardized process. Addressing these two weaknesses could improve the transition process. Other weaknesses that needed to be addressed included the lack of an RN reward system in the PED for compliance with the standardized process; and no sustainability plan to assure that improvements regarding transitions within both the PED and PICU continued after initial process improvements. Sustainability was vital to the quality of PED to PICU transition. Another weakness included the differing care models within the PICU and PED. Care models are important to caring for patients and different models could prohibit cooperation among units.

Opportunities. An external opportunity was the existence of the iHub within the CH, which promoted effective and efficient improvement in the quality of care and processes within the organization. iHub acted as a central location to discuss all quality projects in CHs, bridging departments that had previously operated in a silo. Visual tools were on display throughout the iHub grouped by topics of safety and quality, care and experience, access, financial health, and culture to increase transparency and accountability for project managers. Another opportunity was the presence of the "professional handoff" view section in the electronic health record (EHR) at CH. This view within the EHR was used during handover between RNs within the same department but could be expanded and used in PED to PICU handovers. An additional opportunity was to utilize lessons learned from the successful transitions of care project previously completed within the organization that improved the handover process between cardiac surgery and the PICU in 2017.

Threats. The main threat to improvement was the large number of transitions that occur within CH. The PED transitions patients to the PICU, surgery, and other inpatient units. PICU accepts patients from the PED, surgery, and other inpatient units. Thus, PED to PICU transitions was only one type of patient transition. Standardizing the process by type of transition could overwhelm PEDs and PICU RNs, as the process varies significantly.

Analysis of Assessment Data

Procedure. Further examination of transitions occurred via a survey distributed to168 PED and PICU RNs. The survey included eight questions, two demographic questions and the remainder addressed transitions (knowledge of standardized process, frequency of use of the process, quality of information exchange, presence of information loss, and RN satisfaction with the transition process) on a five-point Likert scale. A final question addressed barriers to efficient and safe patient transitions, with a free-text box, but did not require a response. Overall, 34% (57 of 168) of the RNs completed the survey and 61% (35 of 57) commented on efficiency and safety of transitions. See Appendix D for a graphical representation of responses.

Demographic data. Of the 57 survey respondents, 53% (30 of 57) were PED and 47% (27 of 57) were PICU RNs. The majority, (46%, 26 of 57), worked the 7AM to the 7PM shift.

Knowledge. RNs in the PED evaluated knowledge of the standardized transition process higher than PICU RNs. In the PED, 83% (25 of 30) of RNs ranked knowledge somewhat/very good while only 59% (16 of 27) of PICU RNs ranked themselves in those categories. Thus, additional education was needed for PICU RNs.

Use. PED RNs used the standard process more that PICU RNs. PED RNs (50%, 15 of 30) used the standard process always or most of the time, while fewer PICU RNs (33%, 9 of 27) did. This was a mandatory process and both department's RNs stated low utilization. Increasing utilization was the focus of this project.

Information exchange. PED RNs (67%, 20 of 30) were somewhat/very satisfied while no PICU RNs (0%) were very satisfied and only 33% (9 of 27) were somewhat satisfied. There was room for improvement regarding RN satisfaction with the information exchanged during handover.

Information loss. Results from the survey regarding information loss in transition between the PED and PICU were startling. PICU RNs (70%, 19 of 27) somewhat/strongly agreed that information "falls between the cracks" during handover from the PED to the PICU. Standardizing information exchange as well as supporting PED RNs to provide report within a standardized process needed improvement, as this was a safety concern.

Satisfaction. PED RNs (37%, 11 of 30) were somewhat/very unsatisfied with the process and while fewer PICU RNs were (11%, 3 of 27). The standardized process was designed to address PICU concerns regarding transitions. However, steps in the process were needed to improve how PED RNs managed the process.

Barriers to efficient and safe patient transition. A thematic analysis was conducted regarding responses to barriers. PEDs RNs believed the handover process was patient specific. The standardized process may not apply to all types of patient transfers to PICU, particularly non-emergent patients and trauma patients traveling from trauma bay. One response demonstrated this. "I think this is a valuable standard work for critical patients requiring immediate transfer to PICU. However, when transferring the non-emergent patient it seems

tedious for the charge RNs to confer first. As a charge nurse it is hard to keep track of non-emergent patients going to PICU and I find the staff RN is calling to ask me if I have a RN for them and I didn't even realize I needed to make this arrangement."

PED RNs were concerned about providing face-to-face report in the PICU due to inability to look up patient information in the EHR nor having time to write down vital information. One stated, "Information can be missed with not having the computer in front of the ER RN." Another stated, "In high acuity situation we don't have time to write down information to pass to the PICU nurse at [the] bedside." PED RNs were also concerned about waiting for a bed in the PICU, for a PICU RN to be available to take the patient, and waiting for the PICU RN to settle the patient in a new bed with new equipment prior to report conduction. Additionally, PED RNs identified negative attitudes and perceptions between the PED and PICU, "There are different expectations between the PED and PICU."

The PICU RNs identified that PED RNs often do not follow the standardized process. This included providing full report over the phone, and RNs that were not the primary RN caring for the patient in the PED transferring the patient to the PICU. PICU RNs also identified that the information conveyed included information that was not pertinent to the case or pertinent information was missed. PICU RNs stated that occasionally providers, respiratory therapy, or RNs were not aware patients were on their way to PICU catching staff off guard, another safety concern. One RN stated, "Many times the nurse who brings the patient from the ED is not the nurse who cared for the patient. It would be helpful for the RN to know the patient. Relaying when the patient is on the way would be helpful to wrap up workflow on other patients."

Clinical Practice Problem and Question

According to The Joint Commission (2017), high quality handovers must include information communicated in a standardized format, face-to-face communication with interruptions minimized, information from one source at one time, include all team members, and utilize the EHR. The current process for patient transition between the PED and PICU included many of these vital aspects of handover. However, information content was not standardized, the EHR was not utilized, and no cognitive aid existed to assist RN compliance with the process. The differing PED and PICU care models needed alignment to cultivate improved interpersonal relationships. Rewards for use of the standardized process compliance needed to be established, mechanisms for sustaining change should be initiated, and a guiding committee for PED to PICU patient handover should be created. A standardized process for PED to PICU transition had created improvement yet the process needed to be optimized. Accordingly, an evidence-based project to answer the following clinical question was proposed. *"What is the effect of an improved standardized handover process with use of a cognitive aid on transition outcomes?"*

Review of the Literature

Aim of Review

The aim of the review was to report outcomes of the implementation of a standardized handover process utilized for hospitalized patient transitions between emergency department (ED) and critical care units. Interventions associated with a standardized process were reported.

Methods

Search Methods. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guided the review (Moher, Liberati, Tetzlaff, Altman, & PRISMA Group,

2009). A comprehensive electronic search was conducted in CINAHL, PubMed, and ProQuest Medical databases limited to reviews in English during 2013 to 2018. Keywords were emergency room and department, intensive and critical care unit, handover and handoff.

Inclusion and Exclusion Criteria. ***Population.*** Included were samples that featured patients transitioning between an ED and intensive care units or pediatric emergent transitions; nursing or multidisciplinary handovers were also included. Articles that involved patient transitioning between hospitals, from or to surgery, or from outside the hospital were excluded.

Intervention. Included were samples that featured an intrahospital standardized handover process. Articles that included only an electronic, prehospital, discharge, or intradepartmental handover, no intervention, and integrated literature reviews were excluded.

Comparison. Articles that compared results of a standardized handover before and after implementation were included. Studies that did not compare pre/post results were excluded.

Outcome. Outcome measures included were handover content, information quality, information relevance, information accuracy, patient outcomes, staff interaction and support, and staff satisfaction. Articles were excluded if the outcomes were not clear or undetermined.

Search Outcomes. The search yielded 643 articles from CINAHL (15), PubMed (55), ProQuest (573); and review of references (6); then 9 duplicates were removed. Each article was screened using inclusion and exclusion criteria according to PRISMA (Moher et al., 2009) (see Appendix E). Review of titles and abstracts removed f 618 articles that did not meet inclusion criteria and 19 were excluded after in-depth examination of content. The remaining three articles were included in the review.

Results

Three papers met the criteria for inclusion and were included in the review (see Appendix F). One randomized controlled trial and two prospective quasi-experimental studies were included.

Study Characteristics. Two studies were conducted in the United States (Bigham et al., 2014; Lautz et al., 2018) and one in Belgium (Bergs et al., 2018). All were conducted in acute care hospitals. Bergs et al. (2018) addressed nursing handover of patients from an ED to an intensive care unit. Bigham et al. (2014) addressed nursing handover of pediatric patients transitioning from surgery and the ED to inpatient units, and shift-to-shift handover. Lautz et al. (2018) addressed the multidisciplinary handover of simulated pediatric patients transitioning from an ED to a PICU. Sample sizes ranged from 20 to 130 participants, with 7,864 handoffs in 23 hospitals overall (Berg et al., 2018; Bigham et al., 2014; Lautz et al., 2018).

Intervention and Comparison Characteristics. All three articles addressed the outcomes of a standardized handover process. Bergs et al. (2018) provided a mandatory training session for RNs on the structured handover and procedure; and standardized handover content was placed in an electronic aid. Lautz et al. (2018) included handover feedback followed by a recasting of the handover for the experimental group. Those that received feedback were given a cognitive aid to use during the second round of evaluated handovers (Lautz et al., 2018). Bigham et al. (2014) coordinated with 23 hospitals to evaluate the results of standardizing handovers. Each hospital defined handover intent to develop a common understanding, defined core and supplementary aspects of handover content, created a standardized tool and format for the handoff process, defined the time of responsibility transfer, and maximized team effectiveness by establishing leadership, and team-building to develop a culture of safety (Bigham et al., 2014).

Measures. Bergs et al. (2018) conducted a validated handover survey distributed prior to and two months after the intervention, (Bergs et al., 2018). Lautz et al. (2018) recorded all handovers and utilized a Likert scale to evaluate content of handover communication including senders' reason for the call, airway/breathing, circulation, focused history, interventions, and summary of assessment with a possible evaluation of no, partial, or yes. The scale evaluated the order in which the handover was presented and assessed if the reason for call was communicated before the history, the basic assessment was communicated before history, and the history was communicated before the summative assessment with a possible evaluation of yes or no. The time between the first and second simulated handover was not significant for the control or intervention group ($p>.5$) (Launtz et al., 2018). Bigham et al. (2014) evaluated handovers for one year using a trained interviewer to administer a survey on handover-related care failures, appropriateness of the transition, the frequency of interruptions and distractions, staff satisfaction, and evaluated each handover.

Efficacy of Standardized Handover Procedures. Implementation of a structured handover process increased staff interaction and support within an ED ($p=0.04$) (Bergs et al., 2018). There was no change in the relevance or quality of the transition information provided (Bergs et al., 2018). A structured handover process in combination with standardized handover content resulted in reduced care failures by 69% (Bigham et al., 2014). Commonalities between hospitals that experienced this reduction included standardization of handover (Bigham et al., 2014). Compliance with a standardized handover increased ($p<0.05$) as did overall staff satisfaction ($p<0.05$) (Bigham et al., 2014). A structured handover process with standardized handover content in combination with handover feedback, practice, and a cognitive aid resulted

in an increase in compliance with addressing required elements of the handover process and communication topics ($p<0.01$) (Lautz et al., 2018).

Discussion

Utilization of a standardized handover procedure had many benefits. This included reduced care failures, increased mutual understanding between staff members, and an increase in the amount of vital patient information communicated (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). The standardized handover process included time for questions, required participation by both senders and receivers, and included standardized handover content (Bigham et al., 2014; Lautz et al., 2018). Outcomes of the intervention were improved with the use of a cognitive aid, feedback, and practice (Bigham et al., 2014; Lautz et al., 2018); and resulted in increased patient safety and staff satisfaction (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018).

Limitations. Limitations of the review included the absence of randomized control trials related to pediatric or emergent patient handovers and the poor quality of research contributed to the few studies in the review. An additional limitation of the review included a lack of evidence regarding the sustainability of a standardized handoff process.

Relevance to Clinical Practice

Implementing a standardized handover process has the potential to improve RN satisfaction and patient safety (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). The review demonstrated the benefit of utilizing a cognitive aid and standardized communication content to improve handover safety and overall standardization (Bigham et al., 2014; Lautz et al., 2018). Implementing a standardized handover process in addition to a cognitive aid could reduce handover failure which is vital for high acuity pediatric patients transitioning between high risk

areas. Addressing this issue may improve patient safety and RN satisfaction. A quality improvement project will support The Joint Commission (2017) Provision of Care, Treatment and Services standard and the Performance Improvement standard.

Evidence-Based Initiative

Prior Work

Prior work to the project included creation and implementation of a standardized handover process between the PED and PICU, and cognitive aid in the PICU. A guiding team was also developed for the creation of a cognitive aid for the PED. The aid was created using the Linear Model of Communication (Mohorek & Webb, 2015) (see Appendix A and G). The goal of the cognitive aid in the PICU was to prompt adherence to the standardized process. It guides encoding, and optimizes transmission (See Appendix B). The goal of the cognitive aid in the PED was to prompt facilitation of the standardized process. The first page of the cognitive aid for the PED intended to prompt RNs to make the two calls vital to compliance with the process; and the second page outlined the process in detail in addition to providing a summary of vital handover communication content (See Appendix G).

Problem Statement

The handover process, particularly between high-risk areas like PEDs and PICUs, is an area of patient safety concern (Eppich, 2015; Hilligoss & Cohen, 2013; Reimer et al., 2018; The Joint Commission, 2017). Implementing a standardized handover process may improve patient safety and staff satisfaction (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). Utilization of a cognitive aid to facilitate compliance with a standardized process may improve handover communication content and reduced hospital care failures associated with patient transitions (Bigham et al., 2014; Lautz et al., 2018). A standardized process with a cognitive aid

was previously implemented in CHs and required additional evaluation and implementation strategies to further improve the process.

Purpose of Project and Objectives

The purpose of the project was to conduct a quality improvement project focused on the standardized handover process between the PED and PICU to improve patient transitions. The objectives were:

1) To develop a guiding team of stakeholders.
2) To educate RNs on the standardized process and use of the cognitive aid.
3) To make the EHR available to PED RNs during the bedside handover process.
4) To address perception issues between RNs in the PED and the PICU.
5) To evaluate the standardized process with a cognitive aid in the PED and PICU.
6) To address issues identified throughout the evaluation process.
7) To design and implement a sustainability plan.

These objectives targeted patient, RN, and system outcomes. Patient outcomes included (1) decrease late medications, (2) decrease missed medication, (3) decrease incorrect medications, (4) decrease time to antibiotic administration when sepsis protocol is initiated, (5) and decrease falls. Target system outcomes in the PED included (6) decrease conversion time, and (7) increase utilization of the standardized process. RN outcomes included (8) improve perception of patient safety during and following handover, (9) improve perception of the utilization of the standardized process, (10) increase knowledge of the standardized process, (11) increase satisfaction with information exchanged during report, and (12) decrease in information “falling between the cracks". Target satisfaction outcomes included (13) increase RN satisfaction with the standardized process, and (14) increase patient proxy satisfaction. The target

implementation outcome included (15) decrease event reports submitted regarding the handover between the PED and PICU.

Setting and Participants

The setting of this project was the PED and PICU in a freestanding CH in the Midwest. The PED was a 35-bed department that cares for over 54,000 children annually, and was the only Level I Pediatric Trauma Center on the west side of the state (XXX XXX, 2016). PICU was a 24-bed unit that cares for critically ill, medical and surgical patients. The PICU received 530 admissions from the PED in 2017 (Virtual Pediatric Systems, 2017). The PED admitted 1% of the patients seen to the PICU. Administrative approval for the project in the setting was obtained (see Appendix H and I). The participants were 168 RNs (66 PED and 102 PICU), as well as patients who transition from the PED to the PICU.

Design for Project

This was a quality improvement project with pre/post comparison to evaluate change. As is common in practice, three cycles of PDSA occurred (Institute for Healthcare Improvement, 2017). For the first cycle, CH created a plan and implemented a standardized process for the PED to PICU patient transitions. In prior work, the DNP student analyzed the changes and planned future modifications. This project began with the second PDSA cycle (see Appendix J). The plan phase included a project proposal to the university and organization. The do phase plans were outlined in the implementation strategies. The study phase plan is outlined in the data collection and management strategies. The act phase plans are outlined in the project sustainability and outcome dissemination strategies. The third cycle of PDSA will be initiated by CH to further improve the process based on recommendations from the DNP student.

Models Guiding Implementation

Phenomenon model. The Linear Model of Communication underpinned the handover quality improvement project (Mohorek & Webb, 2015) (see Appendix K). This unidirectional model includes a source of communication, channel through which information is conveyed, and a destination for information (Mohorek & Webb, 2015). The source synthesizes, encodes, and transmits information. The destination, or receiver, decodes the conveyed message into useable information. The model facilitates the identification of encoding, transmission, and decoding errors (Mohorek & Webb, 2015). Interventions and evaluation measures were selected with the goal of eliminating these errors by guiding the encoding process, facilitating an optimal environment for information transmission, and establishing a time for questions following handover to improve decoding.

Change model. The Kotter model is a change framework that directs project implementation (Kotter & Cohen, 2002). Kotter & Cohen (2002) provides a step-by-step process for change. Steps include creating a climate for change by developing a guiding team and creating a vision, engaging the whole organization by cultivating buy-in and empowering action, and implementing the change by ensuring compliance and sustaining the intervention (Kotter & Cohen, 2002). A climate for change was created by the implementation of a standardized process. This increased the urgency for RNs to engage in the quality improvement project in order to make the process more manageable. It also allowed for the creation of a guiding team within the PED to create a cognitive aid. RN buy-in was developed through the use of a pre-survey for the organizational assessment and through rounding with RNs to allow for input on the developed cognitive aid. The survey allowed RNs to start thinking about the standardized process and have a voice in the changes moving forward. Implementation of the interventions

occurred utilizing implementation strategies put forth by experts. The project timeline is in Appendix L.

Implementation Steps and Strategies

Powell et al. (2015) developed a compilation of implementation strategies based on a panel of clinical experts and were utilized to build a comprehensive improvement plan. Sixteen implementation strategies were used in the project.

Organizational assessment. Completion of an organizational assessment allowed for (1) assessment of readiness and (2) identifying barriers and facilitators along with local needs (Powell et al., 2015) as reported above.

Expert involvement. Allowing expert involvement facilitated (3) shadowing a CNS during the organizational assessment, (4) having an advisor who was an expert in implementation science, and (5) the development of a coalition (Powell et al., 2015). The organization advisor was aquatinted with quality improvement and had knowledge of the organization. The coalition included one PED charge RN, two PED staff RNs, the PED CNS, and a project coordinator. Meetings with the team continue through March 2019. Expert involvement was also utilized by using PICU stakeholders to create the communication aid within the PED cognitive aid.

Cognitive aid. The aid was a tool that supported (6) altering allowance structures, (7) developing and implementing the aid/tool to prompt data collection, (8) developing and organizing a system for quality monitoring, (9) audit and feedback, and (10) the identification of early adopters (Powell et al., 2015). The cognitive aid was designed to support adoption and implementation of the standardized handoff process. The aid was used to measures compliance

and monitor quality. It also allowed for the identification of early adopters and rewards for RNs, which may sustain compliance following the project.

Quality improvement and change model utilization. Implementation and change models guided (11) the conducting of cyclical small test of change, and (12) the examination of implementation, (Powell et al., 2015). The project utilized the second cycle of PDSA, guided by Kotter, to reexamination previously and newly implemented interventions including the standardized handover process, the cognitive aid, supporting PED RN use of the EHR during handover, a compliance tracking system, ongoing education, and changes in perception between the PED and PICU.

Education provision. Education was conducted using four implementation strategies including: (13) the development and (14) distribution of educational materials, (15) conduction of education, and (16) the provision of ongoing training (Powell et al., 2015). Education was provided to PED and PICU RNs via verbal communication at staff meetings and huddles, and via written materials. Written materials were created and were distributed in print on communication boards in both the PED and PICU and via email. Education examples for RNs are shown in Appendix M. Remedial education was provided as needed when compliance issues were evident from PICU transition survey analysis and from the PED cognitive aid. Reeducation was provided throughout implementation and evaluation related to the standardized process use with trauma patients, the location of the cognitive aid in the PICU, how to use the cognitive aid in the PED, and the PICU triage process as it relates to increasing conversion time in the PED.

Measures

Measure concepts, definition, level, timing, and collection method for the project are in Appendix N. The project measured implementation strategies, patient and system outcomes,

patient proxy satisfaction, and RN satisfaction and perception. Measures were evaluated prior to the original standardized process implementation in April 2018 and were reevaluated following implementation. Implementation includes (1) initiation of a standardized handover process, (2) a cognitive aid, (3) making the EHR available to PED RNs during the bedside handover, (4) providing additional quality education to RNs, and (5) instituting a system for measuring compliance.

Data Collection Procedures

Data collection occurred via survey, report reviews, and record reviews. Event reports were used to evaluate implementation strategies and patient outcome measures (presence of late medications, missed medication, and incorrect medications following handover). Conversion time for PICU admissions from the PED, time to antibiotic administration for patients on a sepsis pathway, falls, and a patient proxy satisfaction with teamwork and time to admission to the PICU from the PED were collected by the organization and were analyzed prior to and after implementation. Use and compliance with the standardized process were monitored daily following implementation utilizing a survey in the PICU and review of the cognitive aid in the PED. The surveys were distributed to PICU RNs who received patients from the PED (November 2018 to January 2019). The survey was used to collect data concerning PICU RN perception of patient safety during and following the handover and barriers encountered (see Appendix O). The student reviewed the cognitive aid to determine use of the standardized process in the PED. PED and PICU RN satisfaction and perception were assessed by surveys prior to implementation and occurred 2-months following implementation to compare results. RN surveys (see Appendix P) were constructed based on the components of high-quality handovers identified by The Joint Commission (2017) (see Appendix Q).

Data Management and Evaluation

The project coordinator was responsible for data management. Survey data were exported from Qualtrics, cleaned, and de-identified (assigning a respondent ID number) in Microsoft Excel 2016. All data were stored on a secure password protected computer. Data analyses occurred using Statistical Analysis System (SAS 10.0) descriptive statistics, Chi-square tests, and Wilcoxon two-sample tests. p-Value of $\leq .05$ was used as the definition for statistical significance.

Resources & Budget

A budget was designed for the project (see Appendix R). Expenses included time from team members and staff, technology, and printed paper. Team members time was applied to the organizational assessment, development of cognitive aid, data collection, survey completion, education, and evaluation. Total cost was determined by projected time needed and reported salaries for intensive care RNs, PED RNs, and CNSs (Salary.com, 2018a; Salary.com, 2018b; Salary.com, 2018c). Additional costs included time with a statistician, use of a laptop, use of Qualtrics online software, and cost to print the paper cognitive aid (Qualtrics, 2018). Due to the nature of this project, many of these resources were donated. Therefore, the estimated expenses incurred by CH total $3,000.

While there were project costs, they were outweighed by the cost mitigation (see Appendix R). Potential cost savings included avoidance of a Joint Commission citation and the required submission following a citation called an Evidence of Standards Compliance (ESC) (The Joint Commission, 2018). This would have required the same project to occur without any of the donated resources. Another possible cost mitigation factor was the prevention of even one inpatient medication error. The median cost for one inpatient medication error is $1,000 (Lahue

et al., 2012). The final cost mitigation factor was the result of improved RN satisfaction. The cost to replace one full-time RN is, on average, $37,000 (Kurnat-Thoma et al., 2017). Increasing RN satisfaction may contribute to decreased nursing turnover. The cost mitigation sum included was one fourth of the cost to replace an RN due to staff satisfaction because satisfaction is only one of the many reasons for RN turnover. Overall, the total cost incurred by the hospital was only 16% of the potential cost mitigation.

Results

Organizational Data

Conversion Time. Conversion time in the PED was assessed January through March of 2018 and then in January of 2019. One-hundred and eleven transitions were evaluated, prior to implementation, and 38 transitions were evaluated following implementation. Results are included in Appendix S. Chi-square analysis demonstrated that there was not sufficient evidence to say that conversion time improved in the PED ($p=0.97$).

Antibiotic Administration Time in PED. Time to antibiotic administration in the PED for patients on a sepsis pathway was evaluated in January through March and then in December of 2018. Twenty-five events were assessed prior to implementation and five events were assessed following implementation. Frequencies were recorded based on the time to antibiotic administration as meeting or not meeting organizational goals. Frequencies demonstrated a 12% increase in the number of patients that received antibiotics within the optimal timeframe. Descriptive statistics are displayed in Appendix T and graphically represented in Appendix U. Due to small sample size, a comparison of proportions could not be completed.

Patient Proxy Satisfaction. Two questions were analyzed, pre- and post-implementation, from the Pres Ganey® survey. This survey was sent to caregivers for each

patient cared for in the CH. These questions analyzed patient proxy satisfaction related to perceived teamwork of staff, and satisfaction with the wait time associated with admission to the PICU from the PED. The survey also included space for anecdotal comment. Patient proxy satisfaction was assessed January through March of 2018 and then in December of 2018.

Admission wait time. Seventy-six surveys were completed during pre-data collection and 23 surveys were completed during post-data collection. Data was recorded as a frequency of responses that met and did not meet organizational goals. The goal of the organization for this question was for a participant to respond as "very satisfied" with the wait. Results and analysis are included in Appendix T and graphically represented in Appendix U. Chi-square analysis demonstrated that there was not sufficient evidence to say that the proportion of survey participants met the organizational goal ($p=0.15$). However, there was an increase in satisfaction between pre- and post-implementation surveys. Surveys that met the organizational standards started at 62% (47 of 76) and ended and 78% (18 of 23). There was a clinically significant increase of 16.5% of survey respondents that stated they were "very satisfied" with their wait time.

Perceived staff teamwork. Five surveys were completed during pre-data collection and 14 surveys were completed during post-data collection. Data was recorded as a frequency of responses that met and did not meet organizational goals. The goal of the organization for this question was for a participant to respond they "strongly agree" that the staff demonstrated teamwork. Descriptive statistics are included in Appendix T and graphically represented in Appendix U. Due to zero counts in the data set, a statistical comparison pre and post cannot be completed. Similar pre- and post-implementation survey results were noted. There was a 7.1% decrease in survey respondents that stated they were "strongly agreed" the staff demonstrated

teamwork in a general sense. Despite this decrease, there was an anecdotal response to the survey in which they addressed teamwork specific to handover.

Anecdotal responses. One comment concerning handover was included by a respondent during the pre- and post-data collection timeframes. The following comment was included in a survey during post-data collection:

> "Something that really sticks out in my mind is when we were transferred from the ER to the PICU. We arrived and there were maybe a dozen people there waiting for us. They took control right away, and it was obvious to me they were working together and following a plan they had in place – It made me feel at ease knowing they were taking over and were in control of what was happening."

This comment described a transition from the PED to PICU that was perceived well by a patient's caregiver. Despite the inability to label results concerning patient proxy satisfaction as significant, there was improvement.

Falls in PICU. Falls in the PICU were evaluated in January through March of 2018 and in December of 2018. Despite having 1,886 patients admitted during pre-intervention data collection and 611 patients during post-intervention data collection, there were no falls recorded for either group.

PED Cognitive Aid

The cognitive aid in the PED also acted as a compliance tracker. This tool was evaluated in October and November of 2018 and then in January of 2019. Eighty transitions from the PED to the PICU were captured by the cognitive aid prior to implantation and 38 transitions were captured following implementation. Data was recorded as a frequency of responses that met and did not meet goals (see Appendix V). The goal for responses was completion of call #1, full or

partial use of the communication tool, and conversion time less than 43 minutes. Due to small sample sizes, only descriptive statistics were included. A comparison of frequencies between data from pre- and post-implementation are included in Appendix W. Frequencies demonstrated consistently high completion, with a slight increase, of call #1 and call #2. The communication aid was used about half the time, however, the use of the communication tool within the cognitive aid was not required. Utilization was evaluated to determine usefulness and possible need for changes to increase usability for PED RNs.

Pre- and Post-Survey Comparison

Procedure. The RN survey, used as for the organizational assessment, was resent to the 168 PED and PICU RNs following implementation. The survey included the same eight questions. Comparisons were statistically analyzed using the Wilcoxon two-sample test. Overall, 20% (34 of 168) of the RNs completed the pre-survey and 47% (16 of 34) commented on efficiency and safety of transitions. Visual representation of the following comparisons can be seen in Appendix X.

Demographic data. Of the 57 survey respondents to the pre-survey, 53% (30 of 57) were PED and 47% (27 of 57) were PICU RNs. The majority, (46%, 26 of 57), worked the 7AM to the 7PM shift. Of the 34 survey respondents to the post-survey, 56% (19 of 34) were PED and 44% (15 of 34) were PICU RNs. The majority, 41% (14 of 34) worked the 7AM to 7PM shift.

Knowledge. RNs in the PED evaluated knowledge of the standardized transition process higher than PICU RNs in both the pre- and post-survey. In the PED, 83% (25 of 30) of RNs ranked knowledge somewhat/very good while only 59% (16 of 27) of PICU RNs ranked themselves in those categories for the pre-survey. In the post-survey, 100% (19 of 19) of PED RNs racked their knowledge as somewhat/very good while only 60% (9 of 15) of PICU RNs

ranked themselves in those categories. There was not sufficient evidence that the distribution of RN's perception of their knowledge regarding the standardized process differed significantly between the two surveys (p=0.47) (see Appendix Y). Overall, there was improvement in the PED and no change in the PICU.

Use. PED RNs reported higher use of the standard process than PICU RNs in both surveys. PED RNs (50%, 15 of 30) reported use of the standard process as always or most of the time, while fewer PICU RNs 33% (9 of 27) report the same in the pre-survey. In the post-survey, PED RNs (84%, 16 of 19) reported use of the standard process always or most of the time, while fewer PICU RNs (27%, 4 of 15) reported such high use. However, there was sufficient evidence that the distribution of RN's perception of their use of the standardized process differed significantly between the two surveys (p=0.04) (see Appendix Y). Overall, there was significant improvement in the PED and no change in the PICU.

Information exchange. PED RNs (67%, 20 of 30) were somewhat/very satisfied while no PICU RNs (0%) were very satisfied and only 33% (9 of 27) were somewhat satisfied in the pre-survey. In the post-survey, PED RNs (84%, 16 of 19) were somewhat/very satisfied while 47% (7 of 15) of PICU RNs were somewhat satisfied. There was not sufficient evidence that the distribution of RN's satisfaction with information exchanged during handover differed significantly between the two surveys (p=0.15) (see Appendix Y). Overall, there was improvement in both the PICU and PED.

Information loss. In the pre-survey, 70% (19 of 27) of PICU RNs somewhat/strongly agreed that information "falls between the cracks" during handover from the PED to the PICU. In the post-survey, 67% (10 of 15) of PICU RNs somewhat/strongly agreed that information "falls between the cracks". PED RNs also perceived high loss of information during handover. In

the pre-survey and post-survey, 33% (10 of 30) of PED RNs then 47% (9 of 19) of PED RNs responded that they somewhat/strongly agreed that information “falls between the cracks”. There was not sufficient evidence that the distribution of RN’s perception of information “falling between the cracks” during handover differed significantly between the two surveys (p=0.92) (see Appendix Y).

Satisfaction. In the pre-survey, 33% (10 of 30) of PED RNs were somewhat/very satisfied with the process and 44% (12 of 27) of PICU RN reported the same. In the post-survey, 57% (11 of 10) of PED RNs were somewhat/very satisfied with the process and 53% (8 of 15) of PICU RN reported the same. Additionally, in the post-survey 41% (14 of 34) of both PICU and PED RN’s responded they felt neutral about the standardized process. However, there was sufficient evidence to say that the distribution of RN’s satisfaction with the standardized process differs significantly between the two surveys (p=0.01) (see Appendix Y). Overall, there was improvement in the PICU PED.

Barriers to efficient and safe patient transition. A thematic analysis was conducted regarding responses to barriers in the post-survey. Issues identified by the PED RNs included: Concerns with steps that must be taken in the PICU prior to verbal report (see Appendix A for standardized process steps) and that once report was given the receiving PICU team member was perceived as disinterested in verbal report, PICU staff requested report to be given over the phone instead of at the bedside, too many calls were required to complete the process, and PED staff perceived cultural barriers to using computers in the PICU to give report using the EHR. One PED RN stated, “PICU staff still sometimes worried about focusing on the patient and not listening to ED staff. ED staff wait a long time to give reports with some patients as [PICU staff] are focused on getting the patient settled and getting vitals before receiving report.” Another

PED RN stated, “Sometimes PICU has preferred to take report over the phone. I also sometimes feel that there is a big delay with getting the patient ‘settled’ in their bed before I am able to give report.”

Issues identified by PICU RNs were similar to those in the PED, and included: Concerns with steps that must be taken in PICU prior to verbal report, PED staff requesting to give verbal report over the phone instead of at the bedside, and getting all necessary staff to be available for patient arrival to the PICU was difficult especially when the unit was busy. One PICU RN stated, “When the patient arrives you have to get them settled and then get report which prolongs the drop off/pick up process.” Another PICU RN stated, “Most of the problems I see are in getting the staff to be all available at once… or the room can’t be set up as quickly as the [PED] would like… especially if moving patients to make room.”

Transition Survey

The transition survey was sent to each PICU RN that participated in the handover of a patient from the PED. The response rate for this survey was 61% (43 of 71). Responses were recorded as frequencies (see Appendix Z) and were evaluated month-by-month in November 2018, December 2018, and January 2019. A visual representation of this evaluation can be seen in Appendix AA. Small sample size prevents a comparison of proportion.

PICU Cognitive Aid Use. The transition survey demonstrated low use of the cognitive aid in the PICU at 40% (2 of 5) in November, 16% (3 of 19) in December, and 26% (5 of 19) in January indicating the used the tool during handover. Comments of the survey indicated that 28% (12 of 43) RNs did not know where the aid was located, how to use the aid, or what the aid actually was despite multiple rounds of education with charge RNs and staff RNs in the PICU.

Process Compliance. The transition survey indicated a steady increase in compliance with the standardized process from 40% (2 of 5) in November, 47% (9 of 19) in December, and 63% (12 of 19) in January of respondents indicating the standardized process was followed. Results demonstrated an increase in process compliance.

Bedside Report. The transition survey demonstrated consistent utilization of bedside report at 80% (4 of 5) in November, 79% (15 of 19) in December, and 89% (17 of 19) in January of respondents indicating bedside report was completed. Results demonstrated an increase in bedside report.

ED Staff Use of Computer. The transition survey demonstrated low incidence of PED staff using the computer in the PICU during report at 0% (0 of 5) in November, 11% (2 of 19) in December, and 0% (0 of 19) in January of respondents indicating the PED staff member was on the computer during handover. Results demonstrated PED RNs were not using the computer in the PICU. These results were explored with PED stakeholders to determine the cause.

EHR Use. The transition survey showed increasing use of the EHR during report as 40% (2 of 5) in November, 47% (9 of 19) in December, and 53% (10 of 19) in January of respondents indicated the EHR was used during handover. Results demonstrated an increase in use of the EHR during handover.

Perceived Sustained Safety. The transition survey indicated a consistently high perception of patient safety during and following hand over. PICU RNs reported they strongly agreed safety was maintained for 80% (4 of 5) of responses in November, 74% (14 of 19) of responses in December, and 84% (16 of 19) of response in January. Results demonstrated consistently high and increased perceptions of patient safety related to handover.

Time for Questions. The transition survey showed that a time for questions was allowed at every captured transition. Respondents reported that a time for questions was allowed during 100% (43 of 43) of the transitions.

Education Provided. Issues addressed as a result of transition survey responses in November 2018 and December 2018 included: PICU cognitive aid reeducation, and reeducation to allow PED RNs to use the computer in the PICU during handover. Issues with the cognitive aid in the PICU included staff not knowing what it is, where it is, and the charge nurse being too busy to give the sheet to them. Education was provided in written format in the form of emails and in verbal format at staff huddles. Survey results in January 2019 demonstrated this education was largely ineffective. Alternative education recommendations will be discussed.

Event Reports

Event reports were evaluated in January through March of 2018 and in January of 2019. All reports submitted that involved the PICU were analyzed. One hundred and sixty-nine reports were analyzed from January through March of 2018. Forty-nine reports were analyzed from January 2019. There were no event reports concerning late, missed, or incorrect medications related to handover. No event reports were submitted related to handover from the PED were submitted between January and March of 2018. One event report was submitted in January of 2019 concerning a patient handover between the PED and PICU. The report demonstrated the standardized process was not used in the transition. An account of this event is below.

Implementation Measure. One event report was submitted in 2017 related to a problematic handover that initiated this project. A second event report was submitted during post-data collection that has prompted a reevaluation of the standardized process itself. This was the only event reported throughout the duration of this project. The report included details

concerning an acutely-ill patient presenting to the PED that required a vast amount of hospital resources. This included the attention of multiple providers, multiple nurses, and the charge nurse in the PED. Due to the medical needs of the patient, they needed to be emergently transported to the PICU. The standardized process for transfer was unable to be followed because the personnel educated to make the phone calls to allow for the PICU to properly prepare for the patient were occupied with vital duties related to direct patient care. Thus, the PICU was unable to be adequately prepared for assuming care upon arrival of the patient. This event prompted further meetings with stakeholders and changes to organizational policy. It was determined no changes were needed for the standardized handover process. Due to the unique situation, specific organizational policies that applied to the specific patient's situation were modified.

Discussion

Standardized Process Use

Results from pre- and post-surveys, the transition surveys, and from the PED cognitive aid tracking indicated that either consistent use of the standardized process has occurred or an increase in use of the standardized process has occurred. The increase in perceived use in the pre- and post-survey was one of the two statistically significant results in the project. Results differ between the three data collection tools due to collecting information from only PICU RNs on the transition survey, only PED RNs on the cognitive aid, and from both PED and PICU RNs on the pre- and post-surveys. The consistent use or increased use of the standardized process was in alignment with the completed literature review. According to Bigham et al. and Lautz et al. (2014; 2018), use of a cognitive aid can increase standardization and compliance with the implemented handover process.

Additionally, sustaining use of the standardized process met the goals of the project-specific, tailored implementation strategies utilized throughout the duration of this project. According to a systematic literature review by Powell et al. (2019), single-component implementation strategies have resulted in limited success. Implementation strategies should be chosen based on a complete understanding of the problem and the context in which it occurs (Powell et al., 2019). This project demonstrated a clinical success of their findings.

RN and Patient Proxy Satisfaction

The pre- and post-survey demonstrated a statistically significant increase in RN satisfaction. An increase in overall RN satisfaction was consistent with the literature. According to Bigham et al. (2014), implementation of a standardized handover process has the potential to improve RN satisfaction. This measure was one of the two statistically significant findings. This was important to the organization as nursing satisfaction is a vital component to the Magnet® status of the CH.

There was clinically meaningful, but no statistical increase in RN satisfaction with information exchanged. According to Lautz et al. (2018), use of a cognitive aid can increase the amount of vital patient information communicated. A longer time period of study may be needed to attain statistical significance.

Patient proxy satisfaction was also clinically meaningful, but not statistically significant. The increase in patient proxy satisfaction with time associated with admission from the PED to the PICU, and the anecdotal response to the caregiver survey following implementation acted as evidence for overall improvement in handover due to this quality improvement project.

Conversion Time Sustained

Conversion time was initially expected to decrease with implementation of the standardized process. It was assessed prior to implementation, during implementation, and following implementation. The PED cognitive aid evaluated conversion time during and following implementation. This evaluation demonstrated a slight increase in the percent of transitions that met the organizational goal for conversion time, transition in less than 43 minutes, from 40% (32 of 79) to 45% (17 of 38). Conversion time was also assessed prior to implementation and compared to post-data. This comparison showed no change ($p=0.97$).

While the standardized process with cognitive aid did not decrease conversion time, no change was also a positive outcome. The standardized process increases communication between units but does not increase the time to admission. Additionally, qualitative results showed that the process felt long and cumbersome to RNs, however, these calls did not increase conversion time. Conversion time is an important and highly scrutinized metric in emergency departments. The standardized process not increasing this metric in a negative way was an overall benefit of this project.

Perception Complications Identified

Perception issues between the PICU and PED were discovered during this project. This was unexpected because the literature review indicated that use of standardized process can increase mutual understanding between staff members (Bergs et al., 2018). PED and PICU perception complications added complexity to the project. One misconception that was uncovered was the expectation of PED RNs to have patients that need to be admitted to the PICU, be admitted immediately. PED RNs often expressed frustration with wait times associated with admitting patients to the PICU. These RNs correctly understood that one bed in the PICU

was always available. They incorrectly believed this bed was reserved for patients coming through the PED. PED charge RNs were educated during a monthly staff meeting that this bed is actually reserved for any emergent patient in the PED, admitted to any other floor, or coming from surgery. The PED RNs were educated to understand that PICU RNs had to use the principles of triaging to fill this bed. This increase in mutual understanding of the respective departments may have contributed to increased RN satisfaction with the patient handover. This success also shows continuing to increase mutual understanding and address perception issues may further improve the ability of the two departments to work together.

Additional Positive Outcomes

There were multiple improvements in this project that were not statistically significant but were still notable. Additional improvements as a result of this project included: increased knowledge of the standardized process in the PED, increased satisfaction with information exchange in the PED and PICU, increased occurrence of bedside report, and increased use of the EHR during handover. This was significant for the organization because it demonstrated closer alignment with The Joint Commission's quality aspects of handover (see Appendix Q).

Measures Unchanged

Multiple measures did not improve during the project. Time to antibiotic administration for patients on a sepsis pathway remained similar pre- and post-implementation. This was expected as antibiotic administration for septic patients typically occurred in the unit in which the pathway was initiated.

Falls in the PICU, and event reports concerning late/missed/incorrect medications related to handover remained at zero pre- and post-implementation. A time for questions allowed following handover remained at 100% throughout evaluation. These measures started out

optimized and continued throughout evaluation. This was significant for the organization because it showed the standardized process and cognitive aid did not interfere with these measures.

Negative Outcomes

This project had few negative outcomes. PICU RN perception of their knowledge of the standardized process remained the same, PICU and PED RN perception of information "falling between the cracks" in handover remained the same, there was low utilization of the PICU cognitive aid, and PED staff rarely used the computer in the PICU during handover.

The stagnant PICU knowledge of the standardized process may be a result of ineffective communication and the lack of utilization of the PICU cognitive aid. Process compliance is driven by PED RNs so it was most important that this group have the best grasp on the process. However, if PICU RNs are unfamiliar with the process this may cause friction and frustration for PED RNs. Future recommendations to avoid this issue will target increasing use of the PICU cognitive aid.

Prior to implementation, PED staff expressed an interest in having PICU computers available to them during bedside handover. Multiple staff members indicated this would be useful in providing better report. PICU RNs were educated on two separate occasions to help facilitate this. PED stakeholders were consulted concerning this finding. Stakeholders determined the PED cognitive aid alone provided adequate assistance with handover communication. PED RNs will continue to have the option of having computer access in the PICU. However, PICU RNs will no longer be educated this is standard practice.

Information "falling between the cracks" did not change as a result of this project according to PED and PICU RNs. This variable was assessed by RN perception, it should be

evaluated more closely to determine if information loss is truly occurring.

Limitations

Most findings in the project were clinically meaningful, but few were statistically significant. Due to the nature of student projects, time was a constraint on long-term data collection to increase the sample size of the data analyzed. The short-term duration also resulted in data points that were zero. This limited the statistical analysis to just descriptive statistics. Efforts to adjust for small sample size limitations resulted in challenges during statistical analysis. Direct observation of handover would have allowed for precise measurement but the project sample size would have been much smaller. Use of a staff survey to collect information regarding handover allowed for much larger sample sizes but less precision in measurement as it relied on staff perception. Imprecision was mitigated by detailed surveys and staff education. However, this resulted in limitations to internal validity. Additionally, results have limited generalizability to other populations. This was due to small sample sizes, inability to evaluate statistical differences for numerous variables, and data collection with tools that have not been studied for validity or reliability.

Conclusions

Usefulness of Work

Implementation Strategies. This project demonstrated successful use of tailored implementation strategies put forth by implementation experts (Powell et al., 2015; Powell et al., 2019). The most notable included: identification of barriers and facilitators along with local needs, development of a coalition, development of a system for quality monitoring, and use of implementation and change models. Identification of barriers allowed for the development of quality monitoring system: the cognitive aid in the PED. The quality monitoring system in

conjunction with the transition surveys allowed for the provision of ongoing education. The local needs assessment yielded shortcomings related to The Joint Commission Standards. The use of implementation and change models guided the project and allowed for mutual understanding of the process between the project coordinator and stakeholders.

PDSA Model. This model functioned as the change model and an implementation strategy. The project demonstrated successful use of the PDSA model. It included two cycles of the model and will give way to a third cycle led by the CH. This model demonstrated the usability and flexibility needed to complete a quality improvement project in a complex and dynamic environment.

Cognitive Aid. The cognitive aid implemented in the PED allowed for continued tracking of the use of the standardized process and functioned as the system for quality monitoring implementation strategy. This was both an implementation strategy and the plan for sustainability. This aid will continue to be useful for the CH and can be useful in other organizations.

The cognitive aid also included a communication aid for PED RNs. The results showed this tool was used in about half of transitions, and that its use had decreased slightly since implementation. The tool was reevaluated with stakeholders and determined that this tool was highly useable and appropriate for frontline staff. Stakeholders decided there were no changes needed for the communication aid. Responsibility for further evaluation of its usefulness was transferred to the CNS of the PED. The entirety of the aid in the PED is valuable space because the tool is well integrated into the workflow of all staff members at all levels.

The success of the cognitive aid in the PED and the relative failure of the cognitive aid in the PICU was likely due to a workflow component. The PED cognitive aid was built off of a tool

that already existed in the PED, while the PICU cognitive aid was an entirely new document. This demonstrates the value of tools already integrated into a workflow and the need to establish this phenomenon for newly created tools.

Sustainability

The sustainability plan included strategies to support continued RN use of the standardized process, measurement of its use, and continuing quality improvement. The tracking system for compliance embedding into the PED cognitive aid may sustain use of the standardized process (Powell et al., 2015; Powell et al., 2019). The PED stakeholders were consulted concerning the most appropriate way to sustain the tracking system. The developed system included a PED RN that was already allotted paid time to review conversion time, a variable also tracked on the PED cognitive aid. This RN will also start to monitor compliance with the standardized process. The RN will records findings in the site's internal drive for further organizational use and analysis.

Sustaining the quality improvement process was also planned. The CH utilizes the PDSA model for continually improving the organization. In order to sustain the quality improvement process after the conclusion of the project, recommendations were made for a third PDSA cycle. Recommendations and next steps for the organization are detailed below.

Implications for Practice

Spread to Other Contexts. Due to the limited generalizability, this intervention cannot be recommended for other contexts on the basis of the results of this project. However, standardized handover with a cognitive aid is backed by other scholarly literature and is in compliance with The Joint Commission. The PED cognitive aid or the PICU cognitive aid could be adapted in other contexts to help facilitate compliance with a developed standardized process.

Further Study Needed. This project evaluated a standardized handover process with use of a cognitive aid. Additional studies that could contribute to the breadth of knowledge concerning handover of acutely ill pediatric patients include: evaluation of issues related to negative perceptions of PED and PICU RNs, evaluation of handover assessment tools for reliability and validity, and a generalizable evaluation of standardized procedures for handover. A possible study that could be conducted within the organization includes an evaluation of information loss in handover.

Next Steps

Shadowing. Although additional organizational assessment was needed concerning PICU RN perceptions of the PED, and PED RN perceptions of the PICU; the next step for the CH was to start to develop a plan for coordinating a shadow experience between departments during RN orientation. This may increase empathy between the two groups and promote mutual understanding. The two departments must work together seamlessly to care for the most acutely ill pediatric patients. Increasing knowledge of the flow and priorities of the respective departments may facilitate an improvement in their ability to work together. A literature review should be completed as a part of the plan prior to implementation.

Standardized Process Improvements. Despite the many positive outcomes of this project, there were still barriers to efficient and safe patient transition outlined by RNs in the pre- and post-survey, and the conversion time in the PED remained unchanged. The standardized process and cognitive aids in the PICU and PED will be updated to include the reassignment of the initial call to the bedside RN in the PED instead of the charge RN in the PED. The PED will start to evaluate PICU-specific conversion time and will reevaluate this variable following the reassignment of this call. See Appendix BB for the updated PED cognitive aid and Appendix CC

for the updated PICU cognitive aid.

Additional improvements to the standardized process itself were proposed by the stakeholders in the PED. The organization will continue to have meetings with PED and PICU stakeholders to determine how to address further changes to the standardized process.

Education. Education was still needed in the PED and PICU. An upcoming staff meeting with PED RNs will include the PICU's process for triaging patients that must be admitted to the PICU. This has increased mutual understanding between the two departments in the past and will illustrate the need to make the first and second calls in the standardized handover process. The PICU continued to report limited understanding of the standardized process and the tool specific to their department. Education has been proved concerning these topics in the past and the outcomes show it was not effective. Education on this topic will be provided at an upcoming staff meeting instead of at staff huddles and in emails.

Dissemination of Results

A verbal and written report of outcomes, and summary of next steps were provided to stakeholders in the PED and the organizational mentor in the PICU. The written reports specific to the PED and PICU will be used to disseminate outcomes to participating RNs. These findings were also disseminated to the public by submission to ScholarWorks, at a poster reception within the organization, and by completion of a public defense at the university to advisory team members, organizational staff, university faculty, and community members.

Reflection on Doctorate of Nursing Practice Essentials

Essential I: Scientific Underpinnings for Practice

This essential was demonstrated through the use of a framework for increasing understanding of the project's central phenomenon, completion of a literature review using the PRISMA framework, and the selection of evidence-based interventions to address an identified problem in an organization.

Essential II: Organizational and Systems Leadership

This essential was demonstrated by the employment of sensitivity to the affected population, acutely ill pediatric patients and nursing staff, for this project and by the establishment of a sustainability plan based on feasibility and acceptability within the organization. This essential was also demonstrated by the use of evidence-based implementation strategies. Overall, this project improved the quality of care within the organization and allows for increased accountability for the provision of quality patient handovers and increased patient safety through the use of a cognitive aid with embedded compliance tracking.

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

This essential was demonstrated through the use of analytic techniques within a literature review and organizational assessment to increase knowledge related to an issue with an organization and critically appraise opportunities for improvement and possible solutions. This was also demonstrated by the evaluation and analysis of 22 measures in the project that led to meaningful clinical finding and future recommendation to continue improvement. These findings were also disseminated within the site, in the PED and PICU, and to the public by submission to ScholarWorks and by completion of a public defense and the university.

Essential IV: Information Systems and Technology

This essential was demonstrated by the use of technology to improve patient care and a healthcare system. This was completed by the use of technology to obtain and evaluate a care system to determine patient outcomes related to handover. This essential was also demonstrated by the use of technology to create a budget for the project, create educational materials, and to distribute educational materials to staff concerning the standard process for handover.

Essential V: Advocacy for Health Care Policy

This essential was demonstrated by critically analyzing current handover policies within the organization. This project did not include an actual policy change but did include encouragement to make the practice change into a policy to ensure continued use. The project also included critical appraisal of The Joint Commission policies and the project was directed at improving compliance with The Joint Commission (2017) Provision of Care, Treatment and Services standard and the Performance Improvement standard. This was also demonstrated by the advocacy for nursing staff regarding the handover process. This project required advocacy for PED RNs when addressing PICU RNs, and vice versa.

Essential VI: Interprofessional Collaboration

This essential was demonstrated by collaborating and communicating with quality improvement specialist, statisticians, PED RNs, PICU RNs, nurse manager, nurse supervisors, nursing technicians, and hospital supervisors with the goal of improving patient handover. Leadership was demonstrated by leading the quality improvement project, acting as a bridge between two units within one hospital, and functioning as a transitions expert in meetings not directly related to the project.

Essential VII: Clinical Prevention and Population Health

This essential was demonstrated by the evaluation of a current care delivery model and determining appropriate interventions and methods for implementation. The organizational assessment, literature review, and proposal defense all addressed the population of interest: acutely-ill hospitalized pediatric patients.

Essential VIII: Advanced Nursing Practice

This essential was demonstrated by the use of clinical and leadership judgment in complex health situations like that transition between the PED and PICU in order to improve patient outcomes and the healthcare system. This was also demonstrated by developing and sustaining relationships with all professionals involved in the project. The project required active involvement in the organization to guide the quality improvement process to ensure the highest level of evidence-based care was implemented. Outcomes were also analyzed and disseminated to foster optimal care and future quality improvement.

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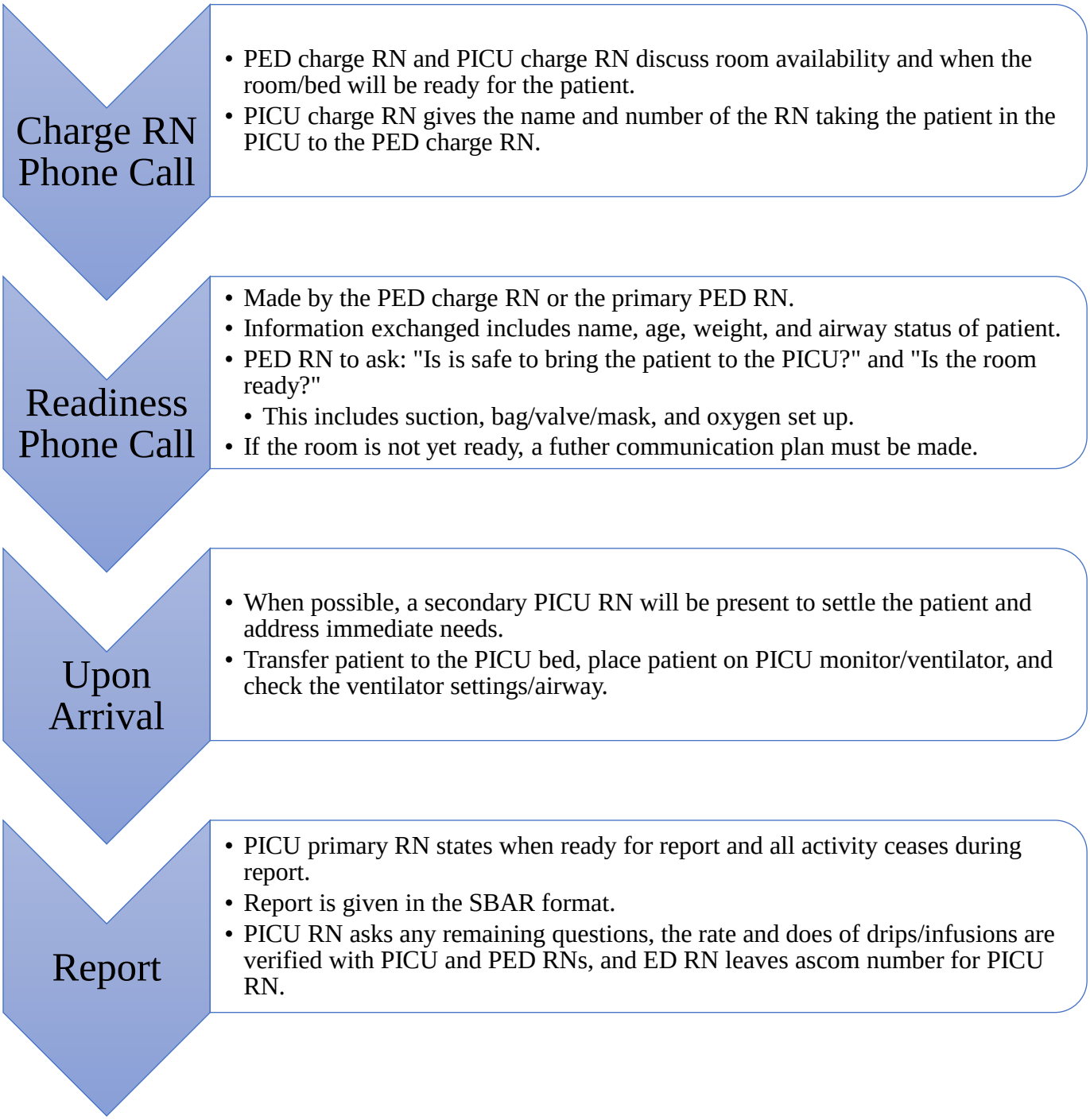
Appendix A

Standardized Handover Process



Appendix B

PICU Cognitive Aid

Emergency Department Handoff

Who: ED nurse, PICU nurse(s), ED attending (if appropriate), PICU intensivist (if appropriate), PICU fellow/APP/resident

Before Arrival

- ED Charge and PICU Charge discuss room availability and when the room/bed will be ready for patient
- PICU Charge gives the name and number of the RN taking the patient to the ED Charge

Initial Phone Call

**Will either come from ED Charge RN or RN caring for the patient in ED

PICU RN obtains the following information:

- Name
- Age
- Weight
- Airway status (intubated yes/no, trach, oxygen needs)

COMMUNICATION:

- Is it safe to bring the patient to the PICU?
- Is the room ready?
  - Suction set up
  - Bag/mask set up
  - Oxygen ready

Upon Arrival

PARK AND BRAKE ED stretcher

Transfer patient to PICU bed

MONITOR:

- Connect patient to PICU monitor
- NT or secondary RN obtains blood pressure

VENTILATOR:

- PICU Intensivist/fellow/APP/resident to check initial vent settings
- Connect patient to PICU ventilator
- RT or RN check for bilateral breath sound

Report

BEDSIDE RN STATES WHEN READY FOR REPORT AND ALL ACTIVITY CEASES DURING REPORT

ED RN gives report using SBAR Format: (offer option of logging in to computer)

- **S**ituation: Why is the patient here?
- **B**ackground: Significant medical history
- **A**ssessment: What interventions did they do in ED and how did the patient respond to those interventions?
  - Last time of sedation, pain meds or paralytics
  - Fluid bolus amounts and time(s)
  - Drips/infusions that are currently running
- **R**ecommendation: Plan for the patient and any outstanding orders that didn't get completed by ED RN.

PICU RN asks any remaining questions
ED RN leaves Ascom number for PICU RN

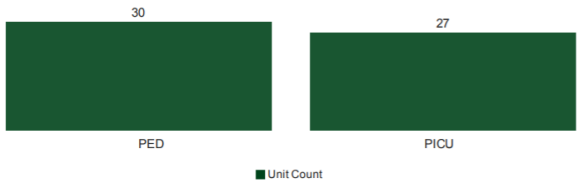
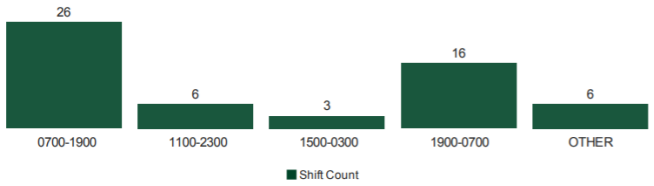
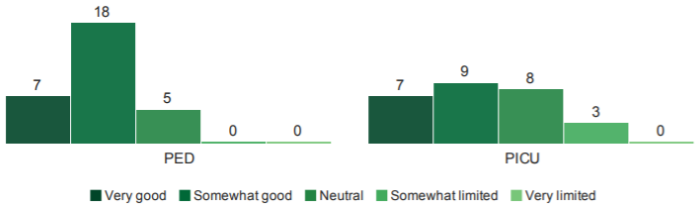
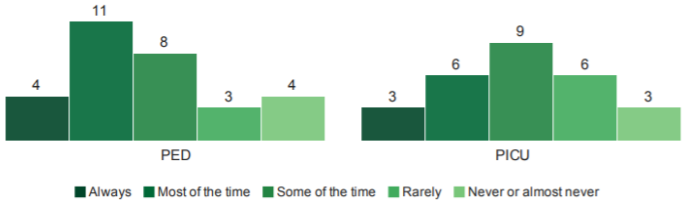
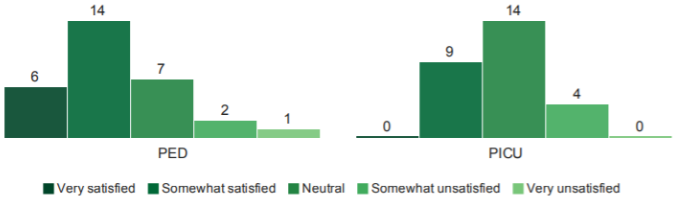
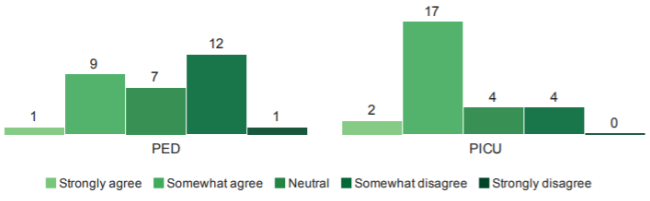
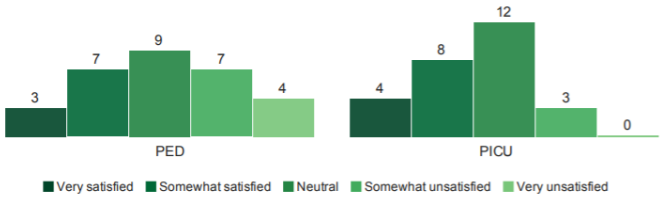
Appendix C

SWOT Analysis of the PED and PICU

Strengths	Weaknesses
• Standardized transition process • SBAR utilization • Cognitive aid existed in PED for transition to the floor • Presence of CNS • Presence of shared leadership teams	• No standardized content • Cognitive aid was not PICU specific • PED did not have a reward system in place • No sustaining mechanisms in place • Differing care models
Opportunities	**Threats**
• iHub • Care transition already addressed from cardiac surgery to PICU • Epic professional handoff view in EHR	• The PED transferring to other floors and surgery • The PICU receiving patients from other floors and surgery

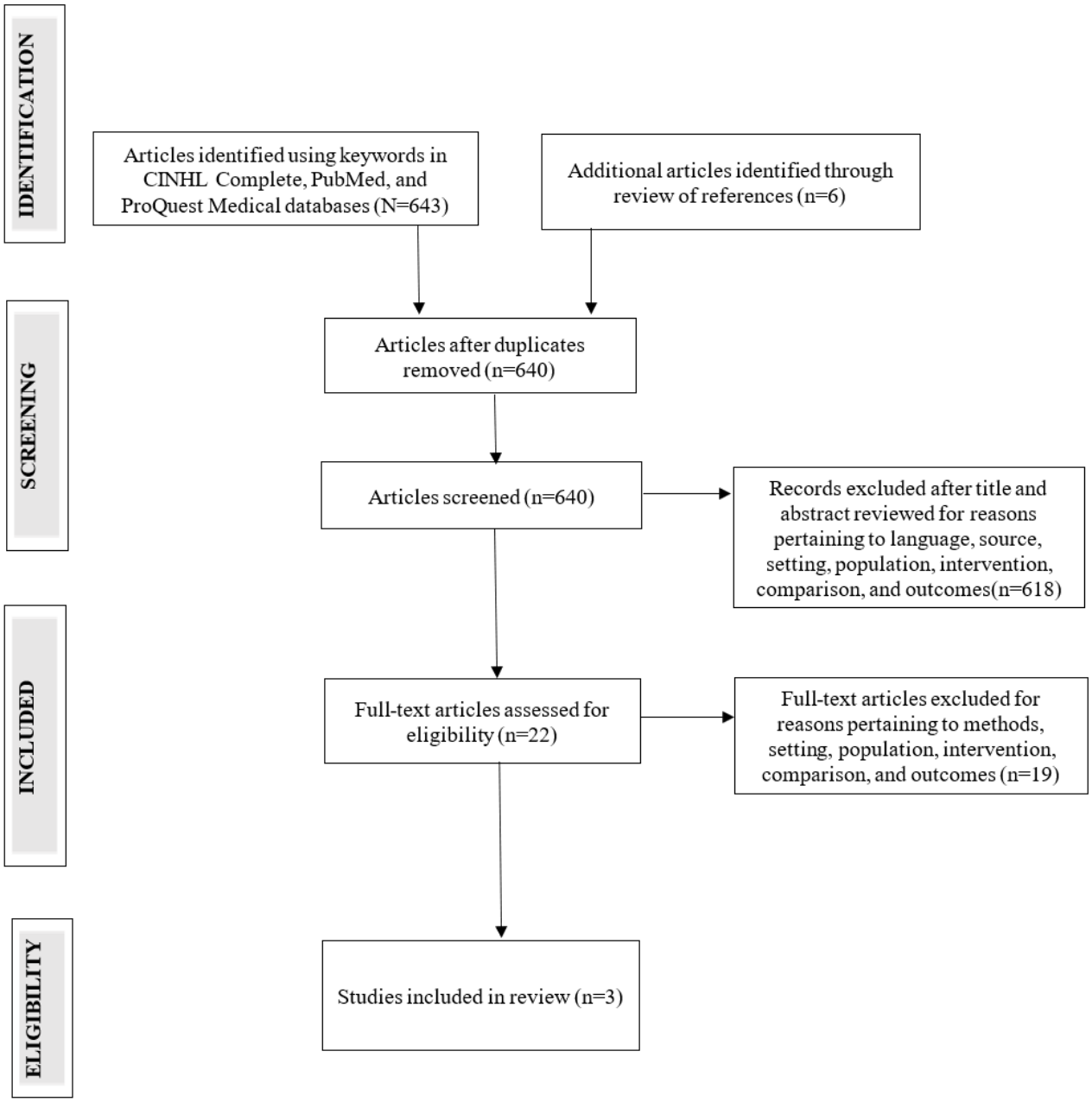
Appendix D

Organizational Assessment Survey Questions with Results

Department demographic data in response to the question, in which department do you work?	
Shift demographic data in response to the question, which shift do you most frequently work?	
Knowledge data in response to the question, how do you rank your knowledge of the content and use of the standardized transition process from the ED to PICU?	
Use data in response to the question, how often do you use the Standard Work or Flowsheet when patients are transferred from the ED to the PICU?	
Information exchange data in response to the question, how satisfied are you with the information exchanged during report?	
Information loss data in response to the statement, information “falls between the cracks” when patients are transferred from the ED to the PICU?	
Satisfaction data in response to the question, how satisfied are you with the implementation of a standardized transition process from the ED to the PICU?	
Are barriers present for safe and/or efficient transitions from the ED to the PICU? If so, what are they?	*answers vary

Appendix E

PRISMA Flow Diagram of Systematic Search



Adapted from "Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement," by D. Moher, A. Liberati, J. Tetzlaff, D. Altman, and PRISMA Group. Copyright 2009 by *PLoS Medicine*.

Appendix F

Table of Evidence

Author	Design	Inclusion Criteria	Intervention vs Comparison	Results	Conclusion
Bergs (2018) evaluated a structured handover process and educational intervention aimed at emergency and intensive care unit(ICU)/ ward nurses.	Quasi-experimental nonequivalent control group pre/posttest study (1 Belgian general hospital)	English, addressing nursing population, within 5 years, inpatient and intra-department handover addressed, inpatient setting	• Educational program designed to improve the handover's implementation.	The survey assessed three categories concerning quality handover: quality of information, relevance of information, and interaction/support. Baseline measurement: Quality of information assessment by ICU/ward nurses had a wide range with a mean of (64.99+/-10.82). The mean evaluation of quality of information assessed by emergency department nurses was higher (75.85+/-9.03). Post-intervention: The significant change that occurred was an increase in the emergency department nurses' evaluation of interaction/support (p=0.04).	There was a variation in the evaluation of handover quality between ICU/ward nurses and emergency department nurses. Educational intervention facilitated increased understanding and positive attitudes towards the handover process.

Bigham (2014). Evaluated the effect of a multihospital attempt to decrease care failures related to handovers.	Quasi-experimental, nonequivalent control group pre/posttest study (43 children's hospitals, N=7,864 handovers)	English, addressing nursing population, within 5 years, inpatient and intra-department handover addressed, inpatient setting	• The intervention was a standardized, evidence-based hand off process created to define handover intent and content, transition responsibilities, and outline a specific tool and process	69% reduction in care failures from baseline to final assessment ($p<0.05$); All three process measures improved; Compliance improved from 87% to 94% ($p<0.05$); Staff satisfaction increased from 55% to 70% ($p<0.05$).	Improvements were attained across multiple hospitals without decreasing staff satisfaction.
Lautz (2018) evaluated if the use of ABC-SBAR, a handover tool, would improve information transmission during simulated pediatric emergencies.	Prospective, randomized, pre/posttest study (Urban, quaternary academic children's hospital, intervention, N=20)	English, addressing nursing population, within 5 years, inpatient and intra-department handover addressed, inpatient setting	• The intervention group (n=12) received education about handover using ABC-SBAR and a cognitive aid • Second handovers were observed and evaluated during a pediatric emergency simulation.	There was a posttest difference between the control and intervention group ($p<0.01$).	Standardized handover, in addition to training and a cognitive aid, may increase inclusion of essential patient information during the handover of a critically ill pediatric patient.

Appendix G

PED Cognitive Aid

Revised 8.23.2018

Time of Admission Order: _____

Inpatient Room Number: _____ **Please place patient sticker here**

Admission/Transfer Checklist

The checklist should be completed by the RN and affirmed by the physician. This is expected to be done at the time of the PEWS scoring and prior to any patient being transported to an in-patient unit or another facility.

1. Are all labs collected?	YES	NO	N/A
2. Are all medications administered/started?	YES	NO	N/A
3. Are all procedures completed?	YES	NO	N/A
4. Are VS done and reviewed?	YES	NO	N/A
5. Has PEWS been documented?	YES	NO	N/A
6. Are all consults done?	YES	NO	N/A
7. Have all concerns been addressed?	YES	NO	N/A
8. Has RT been notified of admission?	YES	NO	N/A
9. (PICU only) Charge Nurse phone call complete?	YES	NO	N/A
10. (PICU only) Readiness phone call complete?	YES	NO	N/A

****All above questions should be marked "YES." All questions marked "NO" need to be explained and who was notified must be documented.**

BARRIERS GETTING PATIENT TO FLOOR IN <43 MINUTES-CHECK ALL THAT APPLY AND EXPLAIN BELOW:

- ED RN Unavailable
- Med/Pharmacy
- ED Procedure
- Lab
- Room Dirty
- Floor RN Unavailable w/in 10 min
- Social Issues
- Charge RN unavailable after 10 min
- Patient Placement Delay
  - Bed Changed
  - Waiting for Crib/Bed
  - Bed assignment >15 min
- Sedation
- Radiology Procedure
- Admitting Team Delay
- Patient's Condition
- IV
  - Difficult Start
  - Done by Other Dept
  - Ordered by Inpt

COMMENTS/EXPLANATIONS:

RN NAME: _____

PHYSICIAN NAME: _____

WHEN DID PATIENT LEAVE ED?

DATE: _____ TIME: _____

****PLEASE BE SURE DISPOSITION DOCUMENTATION TIME MATCHES THE TIME ABOVE***

ED TO FLOOR HANDOVER

CONSIDERATIONS:

- Interpreter/safety attendant need
- Crib for 2-3 yo (If bed, inform family someone will need to stay with their child at all times)
- 9th floor considerations: Cough, runny nose, or fever in the last 24 hours? Positive strep/respiratory viral panel? Has the patient had an LP? Does the patient have Cystic Fibrosis?
  - If YES to any of these questions, contact the transfer center (#13100)

Patient name, DOB, weight, allergies

CHIEF COMPLAINT/HISTORY

NEURO	**SKIN**
PAIN	**IV ACCESS/MEDS**
CARDIOVASCULAR	**VITALS(PEWS)/PROCEDURES/LABS/SEPSIS SCREEN**
RESPIRATORY - Airway issues (trach, NPA, O_2) - CPAP/BIPAP/Hiflow O_2/continuous albuterol must go to 7CH or 8CH	**PSYCHOSOCIAL/FAMILY CONCERNS** - Who is here? - CPS/MSW involvement
GI/GU	**PLAN**

*see *Intra-Hospital Transport of Pediatric Patient* policy (#11078)

ED TO PICU TRANSFER FLOW/HANDOVER

CHARGE NURSE (CN) PHONE CALL

ED CN and PICU CN discuss room availability and when the room/bed will be ready for the patient	PICU CN gives ED CN the name and number of the RN taking the patient

READINESS PHONE CALL

****Made by the ED CN or the primary ED RN caring for the patient; includes transfers from BW ED Trauma Bay*

Information exchange to PICU RN: ▪ Name: _____ ▪ Age: _____ ▪ Weight: _____ ▪ Airway status: (intubated, trach, oxygen need, NG/OG) _____	Patient safety communication: ▪ Is it safe to bring the patient to the PICU? ▪ Is the room ready? ○ Suction, bag/mask, and oxygen set up ▪ If not yet safe to bring patient, make plan for further communication

UPON ARRIVAL

****When possible, secondary PICU RN will be present to settle patient and address immediate patient needs*

- Patient transferred to PICU bed, patient placed on PICU monitor and ventilator, ventilator settings and breath sounds verified

REPORT

****PICU primary RN states when ready for report and all activity ceases during report*

- **Situation:** Why is the patient here
- **Background:** Significant medical history
- **Assessment:**
  - Interventions/response
  - Last time of sedation, pain medications, or paralytics
  - Fluid bolus amounts and time(s)
  - Drips/infusions currently running
- **Recommendation:** Plan for patient/any outstanding ED orders
- PICU RN asks any remaining questions
- Verify rate and dose of drips/infusions with PICU RN
- Leave ascom number for PICU RN

Appendix H

Organizational IRB Determination (available upon request)

Appendix I

GVSU IRB Determination

GRAND VALLEY STATE UNIVERSITY
www.gvsu.edu

DATE: July 18, 2018

TO: Sandra Spoelstra
FROM: HRRC
STUDY TITLE: Patient Handoff in a Children's Hospital from the Emergency Department to the Critical Care Unit:
A Quality Improvement Project
REFERENCE #: 19-025-H
SUBMISSION TYPE: HRRC Research Determination Submission

ACTION: Not Research
EFFECTIVE DATE: July 18, 2018
REVIEW TYPE: Administrative Review

Thank you for your submission of materials for your planned scholarly activity. It has been determined that this project does not meet the definition of research* according to current federal regulations. The project, therefore, does not require further review and approval by the Human Research Review Committee (HRRC).

A summary of the reviewed project and determination is as follows:

The purpose of this project is to improve the handoff of pediatric patients being admitted to the PCCU from the pediatric ED in a local hospital, thus increasing patient safety and staff satisfaction. While this is a systematic investigation, it is not designed to create new generalizable knowledge. Therefore, this project does not meet the federal definition of research and no IRB oversight is needed.

An archived record of this determination form can be found in IRBManager from the Dashboard by clicking the "_ xForms" link under the "My Documents & Forms" menu.

If you have any questions, please contact the Office of Research Compliance and Integrity at (616) 331-3197 or rci@gvsu.edu. Please include your study title and study number in all correspondence with our office.

Sincerely,
Office of Research Compliance and Integrity

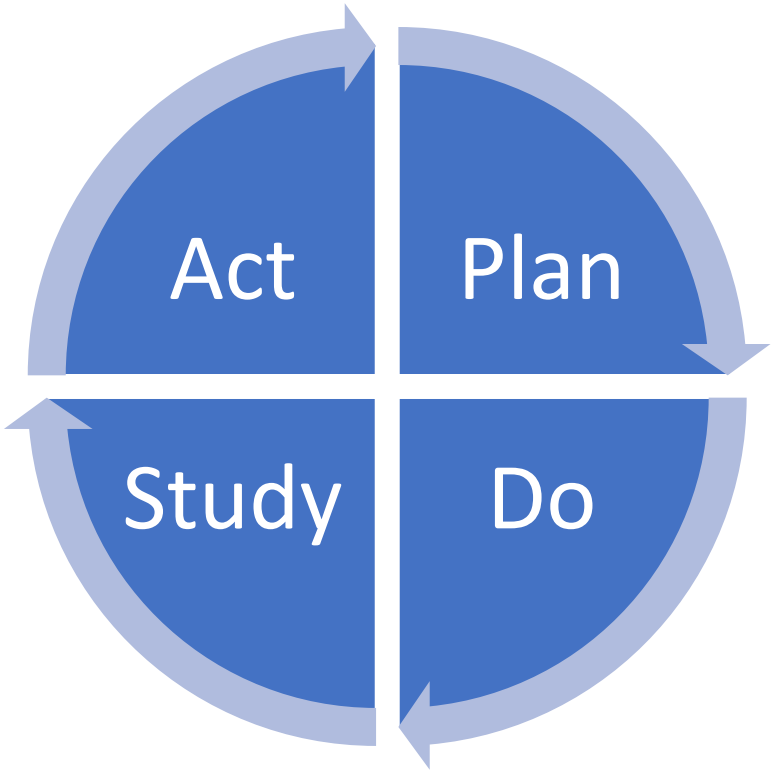
*Research is a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge (45 CFR 46.102 (d)).

Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains: data through intervention or interaction with the individual, or identifiable private information (45 CFR 46.102 (f)).

Scholarly activities that are not covered under the Code of Federal Regulations should not be described or referred to as *research* in materials to participants, sponsors or in dissemination of findings.

Appendix J

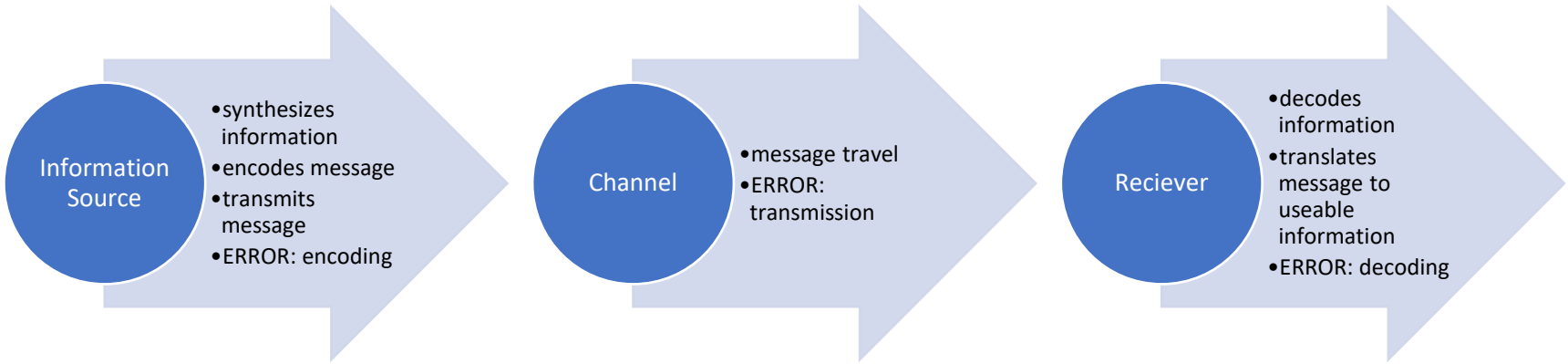
PDSA Model



Adapted from “QI essential toolkit: PDSA worksheet” by the Institute for Healthcare Improvement. Copyright 2017 by *the Institute for Healthcare Improvement*.

Appendix K

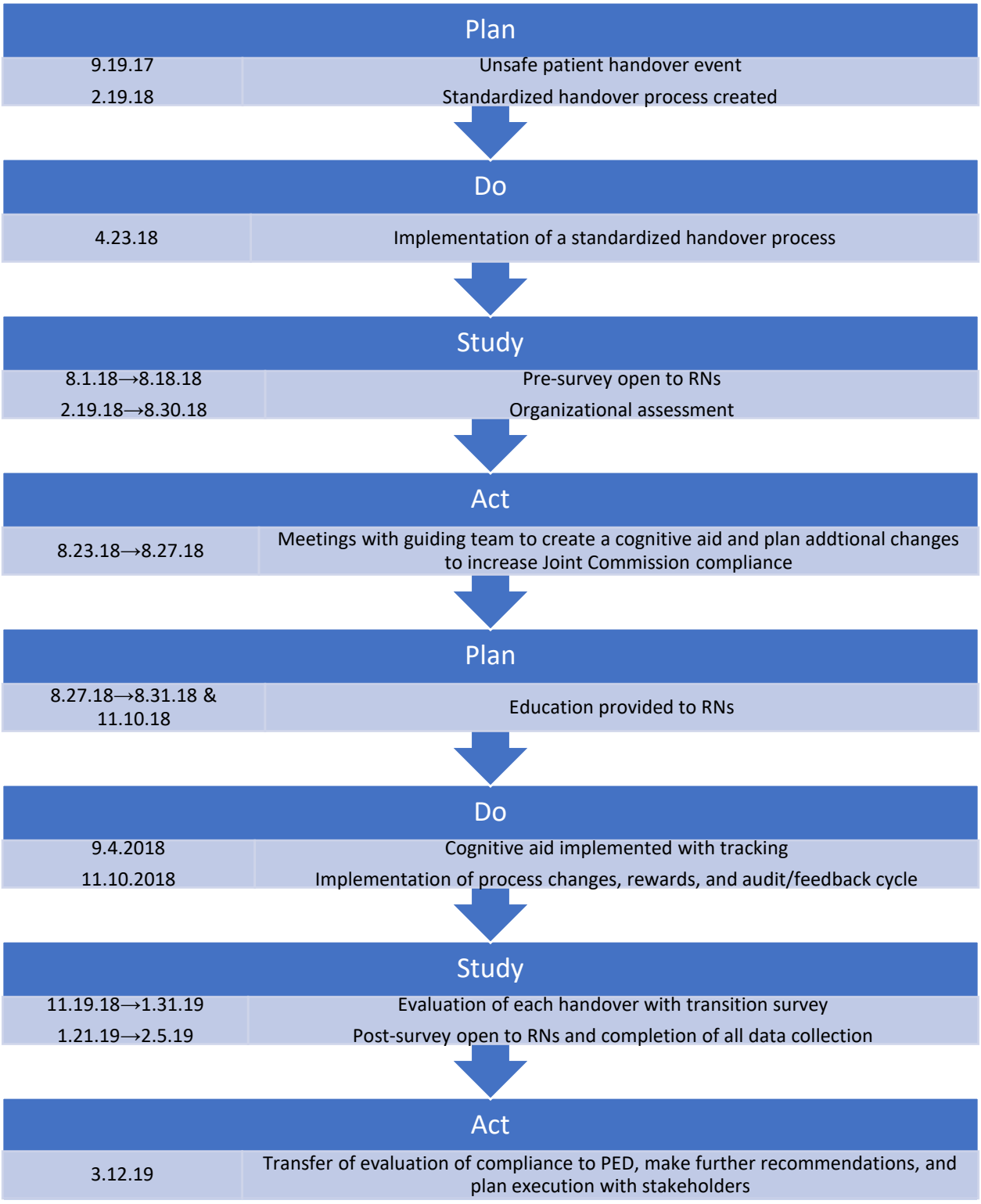
The Linear Model of Communication



Adapted from "A mathematical theory of communication," by C. Shannon, 1948, *The Bell System Technical Journal, 27*(3), 379-423.

Appendix L

Project Timeline



Appendix M

Initial RN Education Example

ED to PICU Handover-New Tool! Go-Live 9/4/18

- As a result of staff input, evidence, and survey results regarding ED to PICU handover, a new tool has been developed to aid these handovers. Special thanks to Kate Shanklin and Lindsey Lobdell for their work on this project!
- The new tool follows the Standard Work and will be located on the back of the Admission/Transfer Checklist "pink sheet"
- The front of the pink sheet has been updated with two questions for PICU patients to reflect whether "charge nurse phone call" and "readiness phone call" have been completed
- The Standard Work should be followed with all transfers to PICU
  - If transferring a patient from BW ED trauma bay, transferring RN places readiness call
- The tool will be available for reference and RN may use for notes if desired
- To support the process, thanks to your feedback, PICU has collaborated to ensure that ED RN's will have a computer available either in the patient room or in the "alcove" for use during report

ED TO PICU TRANSFER FLOW/HANDOVER

CHARGE NURSE PHONE CALL	
ED charge and PICU charge discuss room availability and when the room/bed will be ready for patient	PICU charge gives the name and number of the RN taking the patient to the ED charge
READINESS PHONE CALL ****Made by the ED charge RN or the primary RN caring for the patient in the ED; includes transfers from BW ED Trauma Bay.*	
Information exchange to PICU RN: ▪ Name: _____ ▪ Age: _____ ▪ Weight: _____ ▪ Airway status: (intubated, trach, oxygen need, NG/OG) _____	Patient safety communication: ▪ Is it safe to bring the patient to the PICU? ▪ Is the room ready? o Suction, bag/mask, and oxygen set up ▪ If not yet safe to bring patient, make plan for further communication
UPON ARRIVAL ****When possible, secondary PICU RN will be present to settle patient and address immediate patient needs.*	
▪ Transfer patient to PICU bed, patient placed on PICU monitor and ventilator, ventilator settings and breath sounds verified	
REPORT ****PICU primary RN states when ready for report and all activity ceases during report.*	
▪ **Situation**: Why is the patient here ▪ **Background**: Significant medical history ▪ **Assessment**: o Interventions/response o Last time of sedation, pain medications, or paralytics o Fluid bolus amounts and time(s) o Drips/infusions currently running ▪ **Recommendation**: Plan for patient/any outstanding ED orders ▪ PICU RN asks any remaining questions ▪ Rate and dose of drips/infusions verified with PICU RN ▪ ED RN leaves ascom number for PICU RN	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

Appendix M

Ongoing Education Example

ED to PICU Handover update

Did you know our pink Admission/Transfer Checklist sheets are being reviewed for patients transferred to the PICU to help evaluate the ED to PICU Handover process and tool? We have noticed that often the following PICU questions do not have an answer.

9. (PICU only) Charge Nurse phone call complete?	YES	NO	N/A
10. (PICU only) Readiness phone call complete?	YES	NO	N/A

Please remember to answer! Although the goal is "YES" based on our current process, we recognize there are often barriers. Please select "NO" when it reflects what took place and provide comments to help us understand how to make the process better. As Kate Shanklin reviews the pink sheets, you may receive a candy reward if your questions are completely filled out ☺ Thank you for your support of this process! Please let Rachel or Amanda know if you have any questions or concerns.

Appendix N

Measures

Measure	Definition	Background	Measurement Level	How Measured/ Assessed	When Measured/ Assessed
Demographic Data					
1. Unit of employment	Identified the location of employment of survey respondents.	The location of study was the PED and PICU. The location of employment must be determined for analysis of survey results.	PICU, PED (nominal)	Surveyed RNs in the PICU and PED	Pre-/post-survey to RNs Pre-survey:8.1.18→ 8.18.18 Post-survey: 1.21.19→2.5.19
2. Shift	Identified the shift the survey respondent most frequently worked.	According to the clinical nurse specialist of the PICU, compliance with quality improvement projects may correlate with the shift an RN works (C. Steenland, personal communication, June 14, 2018).	0700-1900, 1100-2300, 1500-0300, 1900-0700, OTHER (nominal)	Surveyed RNs in the PICU and PED	Pre-/post-survey to RNs Pre-survey:8.1.18→ 8.18.18 Post-survey: 1.21.19→2.5.19

Patient Outcome Measures					
1. Late medications	Tracked frequency reported late medication within the event reporting system at the CH. Late medications were defined and tracked by the organization.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). Therefore, this hospital care failure was monitored.	Number of events (ordinal)	Reviewed organizational event reports	Evaluation of event reports Pre-data: January through March 2018 Post-data: January 2019
2. Missed medication	Tracked frequency of ordered, not given, medication reported within the event reporting system at the CH. Missed medications were defined and tracked by the organization.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). Therefore, this hospital care failure was monitored.	Number of events (ordinal)	Reviewed organizational event reports	Evaluation of event reports Pre-data: January through March 2018 Post-data: January 2019

3. Incorrect medication	Tracked frequency of medication incorrectly given reported within the event reporting system at the CH. Incorrect medications were defined and tracked by the organization.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). Therefore, this hospital care failure was monitored.	Number of events (ordinal)	Reviewed organizational event reports	Evaluation of event reports Pre-data: January through March 2018 Post-data: January 2019
4. Time to antibiotic	Percentage of patients placed on the sepsis pathway that receive antibiotics within one hour of initiation. This time frame was defined and tracked by the organization.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). Therefore, this hospital care failure was monitored.	Time in minutes (ordinal)	Pre- and post-data collected by the organization	Evaluation of organizational data Pre-data: January through March 2018 Post-data: December of 2018

5. Falls	Frequency of falls within the PICU. Falls were defined and tracked by the organization.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018). Therefore, this hospital care failure was monitored.	Number of events (ordinal)	Pre- and post-data collected by the organization	Evaluation of organizational data Pre-data: January through March 2018 Post-data: December 2018
System Measures					
1. Conversion time	This variable is the time between disposition and admitting the patient to the PICU from the PED. The target goal of the CH is less than 43 minutes.	Utilization of a standardized handover process may reduce hospital care failures (Bigham et al., 2014). Therefore, this hospital care failure will be monitored.	Met, Not Met (nominal)	Pre- and post-data collected by the organization	Evaluation of organizational data Pre-data: January through March 2018 Post-data: January 2019

2. Use	--	--			
a. Call #1	The first step of the standardized process, the initial call to the PICU charge nurse, was completed. Completion was determined by assess the PED RN's completion of the front page of the cognitive aid.	Utilization of a cognitive aid increased the ability of healthcare providers to follow a standardized process (Lautz et al., 2018). Ongoing education and small cyclical changes, both expert implementation strategies, may improve compliance with the standardized process (Powell et al., 2015).	Complete, Not Complete (nominal)	Reviewed PED cognitive aid	Evaluation of PED cognitive aid Pre-data: September through October 2018 Post-data: January 2019
b. Call #2	The second step of the standardized process, the secondary call to the PICU primary RN, was completed. Completion was determined by assess the PED RN's completion of the front page of the cognitive aid.	Utilization of cognitive aid increased the ability of healthcare providers to follow a standardized process (Lautz et al., 2018). Ongoing education and small cyclical changes, both expert implementation strategies, may improve compliance with the standardized process (Powell et al., 2015).	Complete, Not Complete (nominal)	Reviewed PED cognitive aid	Evaluation of PED cognitive aid Pre-data: September through October 2018 Post-data: January 2019

c. Cognitive aid used in PED	Use was determined by utilization of any part of the back page of the cognitive aid.	Utilization of cognitive aid increased the ability of healthcare providers to follow a standardized handover process (Lautz et al., 2018).	Complete, Not Complete (nominal)	Reviewed PED cognitive aid	Evaluation of PED cognitive aid Pre-data: September through October 2018 Post-data: January 2019
d. Cognitive aid used in PICU	This variable represented the PICU cognitive aid and if it was used by PICU RN. Use was determined by the RN in the transition survey.	Utilization of cognitive aid increased the ability of healthcare providers to follow a standardized handover process (Lautz et al., 2018).	Yes, No (nominal)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19
e. Compliance with standardized process	This variable was used to determine if the standardized process for handover between the PED and PICU was followed. Compliance was defined as completion of both calls and bedside handover report.	Compliance with a standardized handover process increased with the use of a cognitive aid (Bigham et al., 2014; Lautz et al., 2018).	Yes, No (nominal)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19

f. Electronic health record utilized	This variable assessed the frequency of electronic health record use during the handover process. Use of the HER was defined as one RN involved in the handover accessing the patient's chart during handover.	The use of an electronic health record was a component of a quality handover (The Joint Commission, 2017).	Yes, No (nominal)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19
g. Bedside report utilized	This variable assessed the frequency face-to-face communication used during handover. This was defined as the PED RN providing a verbal report in the PICU room or just outside the room if necessary.	Face-to-face communication was a component of a quality handover (The Joint Commission, 2017).	Yes, No (nominal)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19

h. Staff member use of computer during handover	This variable was used to evaluate which, if any, staff members utilized the computer during report. Use of computer was defined as one staff member logged onto a computer in or just outside the PICU room during the verbal report.	Utilization of the electronic health record, a component of a quality handover, requires use of a computer (The Joint Commission, 2017). Based on PED feedback, a barrier to following the standardized process included having no access to a computer during bedside handover. PICU staff will be educated to allow computer access to PED staff at handover.	ED staff member, PICU staff member, both, neither (nominal)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19
i. Time for questions allowed	This variable assessed the frequency of a time for questions following handover. This was defined as a staff member involved in the handover initiating a time for questions following the verbal report.	Allowing a time for questions after handover was a component of a quality handover (The Joint Commission, 2017).	Yes, No (nominal)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19

Perception Measures					
1. Safety sustained during and after handover	This variable assessed the perception of PICU RNs concerning patient safety during and following a patient handover from the PED. Patient safety was defined by the PICU RN's perception.	Implementing a standardized handover process may improve patient safety (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018).	Strongly agree, somewhat agree, neutral, somewhat disagree, strongly disagree (ordinal)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19
2. Barriers to patient safety	This was a qualitative variable that was collected from PICU RNs following handovers from the PED concerning barriers faced to patient safety. Barriers were defined by the PICU RN's perception.	This is variable allowed for continual monitoring of the handover process and helped to identify education or quality improvement needs.	Data collected in text box (qualitative)	Surveyed PICU RNs using the transition survey	Transition survey sent to PICU staff following transitions from the PED between 11.19.18→ 1.31.19
3. Frequency of standard handover process use	This variable evaluated the perceived frequency of personal use of the standardized process. Use of the process and frequency was defined by the PICU or PED RN's perception.	Utilization of cognitive aid increased the ability of healthcare providers to follow a standardized handover process (Lautz et al., 2018).	Always, most of the time, some of the time, rarely, never or almost never (ordinal)	Surveyed RNs in the PICU and PED	Pre-/post-survey to RNs Pre-survey:8.1.18→ 8.18.18 Post-survey: 1.21.19→2.5.19

4. Knowledge of standard handover policy	This variable assessed the self-evaluated knowledge level of the standardized handover process of the RNs using the process. Knowledge level was defined by the PICU or PED RN's perception.	Utilization of cognitive aid increased the ability of healthcare providers to follow a standardized process (Lautz et al., 2018). This demonstrates an increased knowledge of the process.	Very good, somewhat good, neutral, somewhat limited, very limited (ordinal)	Surveyed RNs in the PICU and PED	Pre-/post-survey to RNs Pre-survey:8.1.18→ 8.18.18 Post-survey: 1.21.19→2.5.19
5. Information quality	This variable assessed the RN evaluation of the quality of information exchanged during the handover process. Quality of information was defined by the PICU or PED RN's perception.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018).	Very satisfied, somewhat satisfied, neutral, somewhat unsatisfied, very unsatisfied (ordinal)	Surveyed RNs in the PICU and PED	Pre-/post-survey to RNs Pre-survey:8.1.18→ 8.18.18 Post-survey: 1.21.19→2.5.19
6. Information loss	This variable assessed the RN's evaluation of the presence of information loss during the handover process. The presence of information "falling between the cracks" was defined by the PICU or PED RN's perception.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018).	Strongly agree, somewhat agree, neutral, somewhat disagree, strongly disagree (ordinal)	Surveyed RNs in the PICU and PED	Pre-/post-survey to RNs Pre-survey:8.1.18→ 8.18.18 Post-survey: 1.21.19→2.5.19

Satisfaction Measures					
1. RN satisfaction	This variable assessed the RN's evaluation of their satisfaction with the handover process. The term satisfaction was defined by the PICU or PED RN's perception.	Utilization of a standardized handover process may increase mutual understanding between staff members (Bergs et al., 2018).	Very satisfied, somewhat satisfied, neutral, somewhat unsatisfied, very unsatisfied (ordinal)	Surveyed RNs in the PICU and PED	Pre-/post-survey to RNs Pre-survey:8.1.18→ 8.18.18 Post-survey: 1.21.19→2.5.19
2. Patient proxy satisfaction with staff teamwork	This variable was used to determine the satisfaction level of patient proxies at the CH. This variable was monitored by one question on the Press Ganey survey concerning the level of teamwork in the CH perceived by the patient proxy.	Utilization of a standardized handover process may increase mutual understanding between staff members (Bergs et al., 2018). The project could have translated to improving how patient proxies perceive teamwork at the CH.	Very satisfied, somewhat satisfied, neutral, somewhat unsatisfied, very unsatisfied (ordinal)	Pre- and post-data collected by the organization	Evaluation of organizational data Pre-data: January through March 2018 Post-data: December of 2018

3. Patient proxy satisfaction wait associated with admission from the PED to PICU	This variable was used to determine the satisfaction level of patient proxies at the CH. This variable was monitored by one question on the Press Ganey survey concerning the wait associated with admission from the PED to PICU.	Utilization of a standardized handover process may improve the content of handovers and reduce hospital care failures (Bergs et al., 2018; Bigham et al., 2014; Lautz et al., 2018).	Very satisfied, somewhat satisfied, neutral, somewhat unsatisfied, very unsatisfied (ordinal)	Pre- and post-data collected by the organization	Evaluation of organizational data Pre-data: January through March 2018 Post-data: December of 2018
Implementation Measure					
1. Event reports	This variable was used to determine the frequency of event reports submitted within the CH. An event report was included in the count if it applied to the handover process or concerned an event that followed a handover between the PED and PICU.	Utilization of a standardized handover process may reduce hospital care failures (Bigham et al., 2014).	Number of events (ordinal)	Reviewed organizational event reports	Evaluation of event reports Pre-data: January through March 2018 Post-data: January 2019

Appendix O

Transition Survey

I work in the: (select one)

- ED
- PICU

Admitting diagnosis of patient: _____

Was the standardized transition process **tool** used during the handover?

- Yes
- No

Was the standardized transition process **policy** followed?

- Yes
- No

If no, was there a barrier to the use of ether: _____

Was the electronic health record used during the handoff?

- Yes
- No

Was the ED or PICU staff member logged onto the computer during report?

- ED staff member
- PICU staff member
- Both
- Neither

Was face-to-face communication used during the handoff?

- Yes
- No

Was a time for questions allowed during the handoff?

- Yes
- No

Was patient safety sustained during (and after) handoff?

- Strongly agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Strongly disagree

Did you face any barriers to sustaining patient safety?

_____

_____

Appendix P

Pre-/Post-Survey

I work in the: (select one)

- ED
- PICU

What shift do you most frequently work?

- 0700-1900
- 1100-2300
- 1500-0300
- 1900-0700
- OTHER

How would you classify your knowledge concerning the standardized transition process from the ED to the PICU?

- Very good
- Somewhat good
- Neutral
- Somewhat limited
- Very limited

How often do you use the Standard Work/"pink sheet" (ED) or Flow Sheet(PICU) when patients are transferred from the ED to the PICU?

- Always
- Most of the time
- Some of the time
- Rarely
- Never or almost never

How satisfied are you with the information exchanged during report?

- Very satisfied
- Somewhat satisfied
- Neutral
- Somewhat unsatisfied
- Very unsatisfied

Information "falls between the cracks" when patients are transferred from the ED to the PICU.

- Strongly agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Strongly disagree

How satisfied are you with the implementation of a standardized transition process from the ED to the PICU?

- Very satisfied
- Somewhat satisfied
- Neutral
- Somewhat unsatisfied
- Very unsatisfied

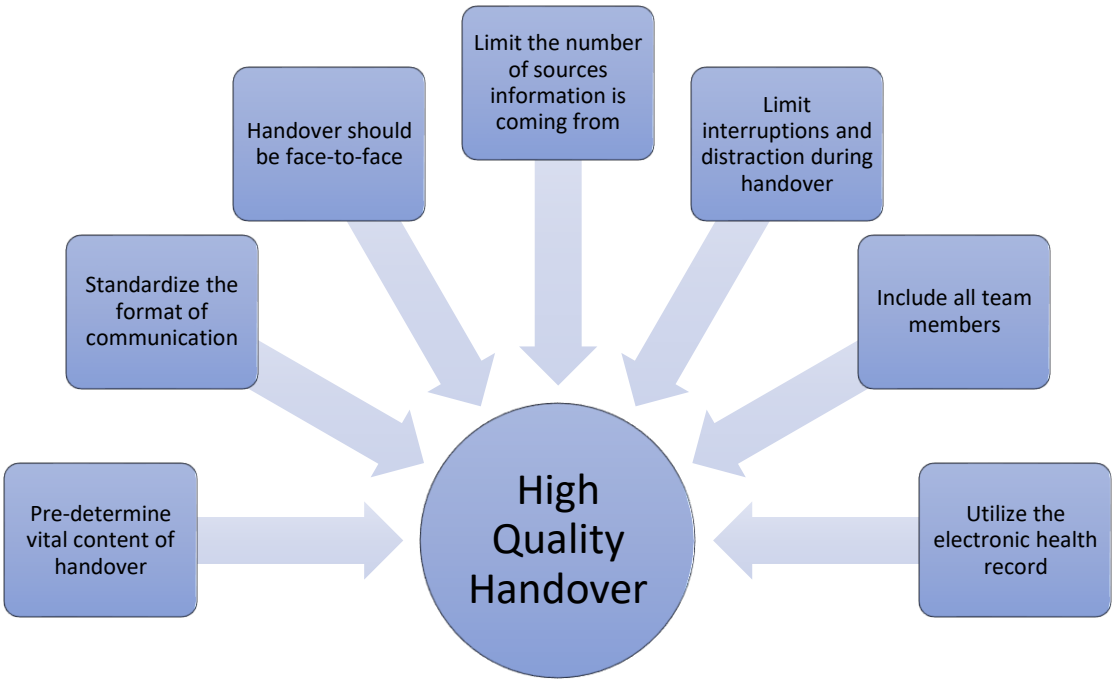
Are barriers present for safe and/or efficient transitions from the ED to the PCCU? If so, what are they?

_____

_____

Appendix Q

The Joint Commission Handover Components



Adapted from "Inadequate hand-off communication," by The Joint Commission, 2017. Retrieved from https://www.jointcommission.org/assets/1/18/SEA_58_Hand_ off_Comms_9_6_ 17_FINAL_(1).pdf

Appendix R

Budget for DNP Project

Doctor of Nursing Practice Project Financial Operating Plan **Improving the Patient Handover from a PED to a PICU** **Using a Cognitive Aid**	
POTENTIAL COST SAVINGS	
Cost mitigation	
ESC submission to The Joint Commission	$ 8,933.50
RN turnover	$ 9,000.00
Prevention of 1 inpatient medication error (median cost)	$ 1,000.00
POTENTIAL COST SAVINGS TOTAL	$ 18,933.50
EXPENSES	
Project Expenses (Including Donated Resources)	
Project Manager Time	$ 3,900.00
Team Member Time:	
Clinical Nurse Specialist (2)	$ 576.00
Registered Nurses (Time Spent Completing Questionnaires)	$ 900.00
Education:	
Charge Nurses (one-time)	$ 127.50
Registered Nurses (two-times)	$ 1,425.00
Consultations:	
Statistician	$ 100.00
Qualtrics online software	$ 1,500.00
Laptop	$ 400.00
Cost of print/copy/fax	$ 5.00
Project Expenses Total (Including Donated Resources)	$ 8,933.50
Donated Resoures	
Project Manager Time	$ (3,900.00)
Statistician	$ (100.00)
Laptop	$ (400.00)
Qualtrics online software	$ (1,500.00)
Donated Resources Total	-5,900.00
TOTAL EXPENSES INCURED BY HOSPITAL	$ 3,033.50

Appendix S

Transition time in PED before and after implementation

	% (n)			
	Before	After	Difference	p-Value
<43 minutes	45.0% (50)	44.7% (17)	(0.3%)	0.97
>43 minutes	55.0% (61)	55.3% (21)	0.3%	

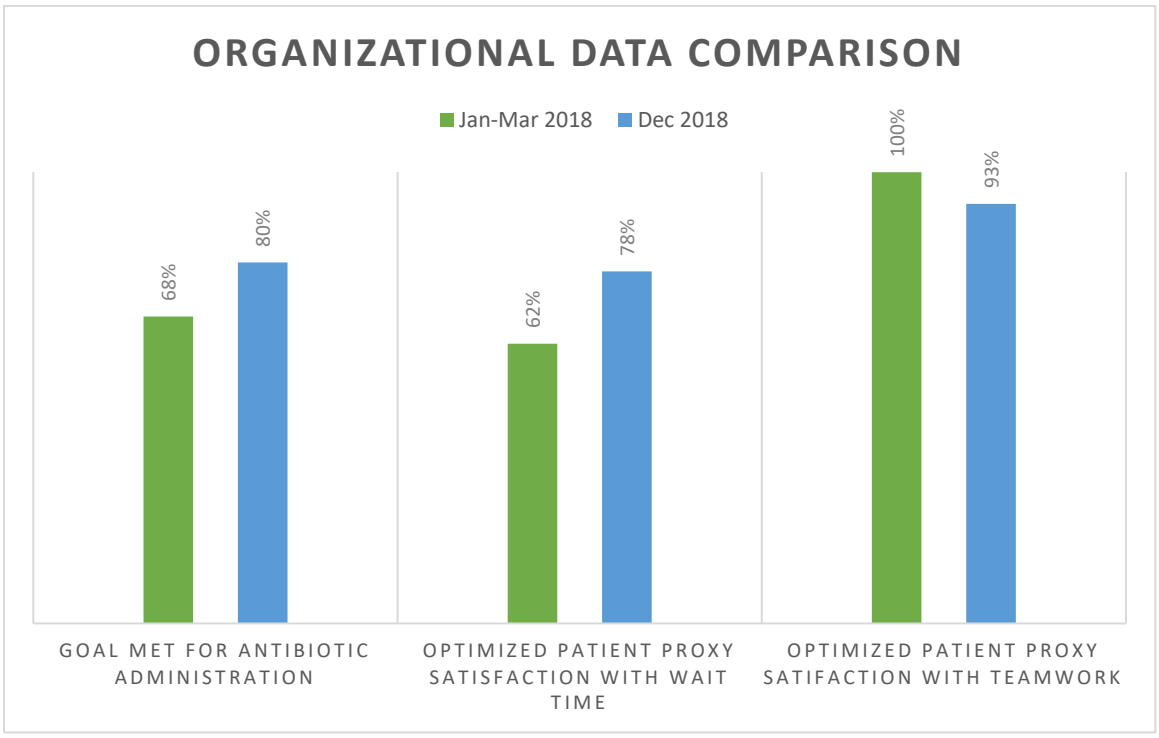
Appendix T

Time to antibiotic administration in PED, patient proxy satisfaction with wait time admission PED to PICU and satisfaction with staff Teamwork in PICU

	% (n)			p-Value
Factor	Before	After	Difference	
Goal met for antibiotic administration for SEPSIS	68% (17) Yes 32% (8) No	80% (4) Yes 20% (1) No	12%	-
Patient proxy satisfaction with wait time admission PED to PICU	61.8% (47) Yes 38.1% (29) No	78.3% (18) Yes 21.7% (5) No	16.5%	0.15
Patient proxy satisfaction with staff Teamwork in PICU	100% (5) Yes	92.9% (13) Yes 7.1% (1) No	(7.1%)	-

Appendix U

Comparison of time to antibiotic administration in PED, patient proxy satisfaction with wait time admission PED to PICU and satisfaction with staff Teamwork in PICU



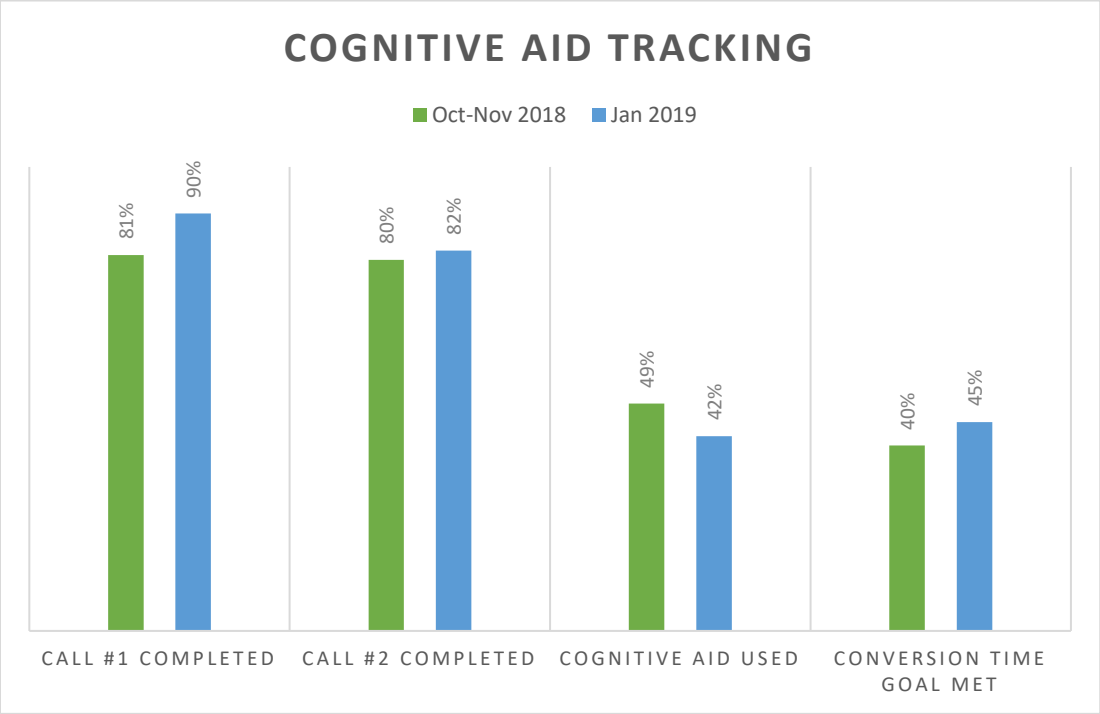
Appendix V

PED Cognitive Aid call 1, 2, use, ant time goal med in PED

PED Cognitive Aid Collected Data			
	% (n)		
	Before	After	Difference
Call #1 completed	81.3% Yes (65) 18.8% No (15)	89.5% Yes (34) 10.5% No (4)	8.2%
Call #2 completed	80.0% Yes (64) 20.0% No (16)	81.6% Yes (31) 18.4% No (7)	1.6%
Cognitive aid used	48.8% Yes (39) 51.3% No (41)	42.1% Yes (16) 57.9% No (22)	(6.7%)
Conversion time goal met (<43 mins)	40.0% Yes (32) 60.0% No (48)	44.7% Yes (17) 55.3% No (21)	4.7%

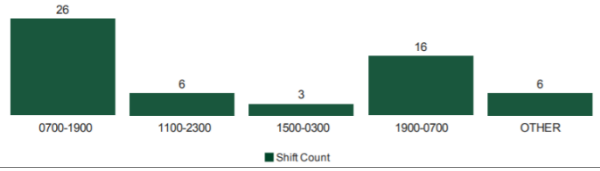
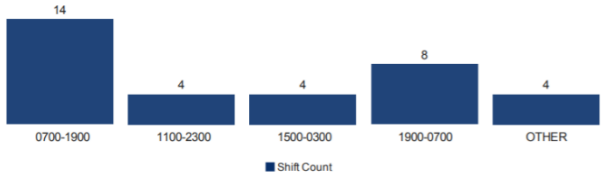
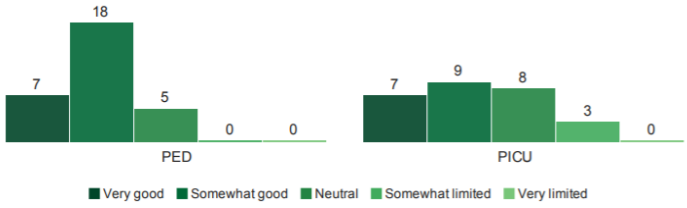
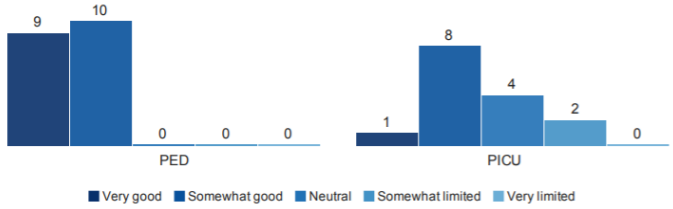
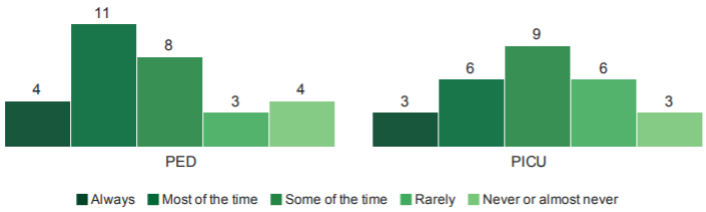
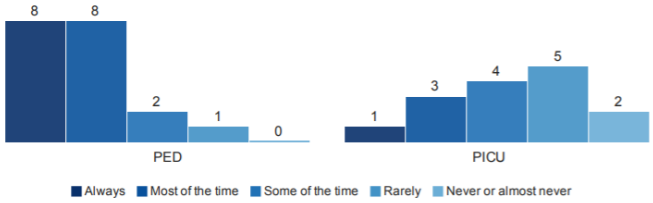
Appendix W

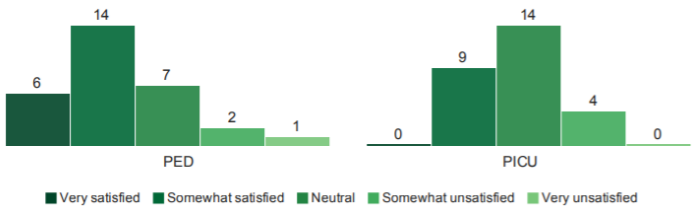
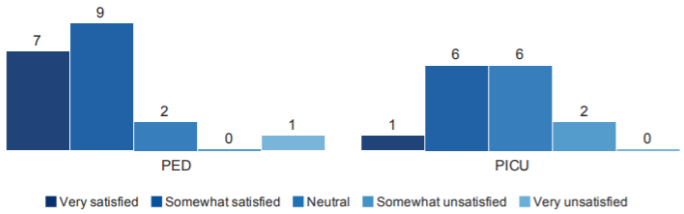
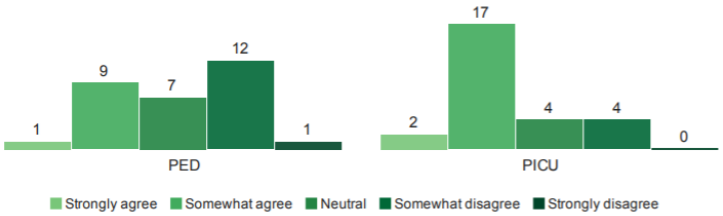
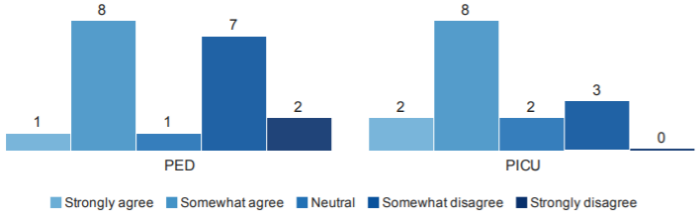
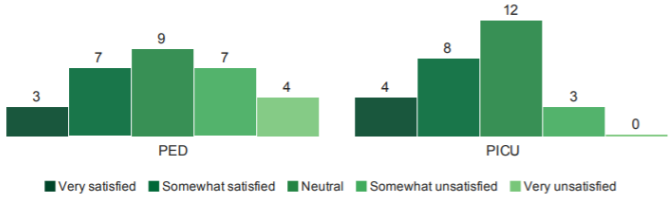
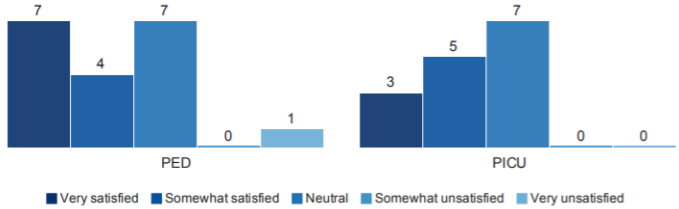
PED Cognitive Aid call 1, 2, use, and time goal met in PED visual comparison



Appendix X

Results from the Pre- and Post-Surveys

Pre- and Post-Survy Response Comparisons		
	Pre-Survey	Post-Survey
Department demographic data in response to the question, in which department do you work?		
Shift demographic data in response to the question, which shift do you most frequently work?		
Knowledge data in response to the question, how do you rank your knowledge of the content and use of the standardized transition process from the ED to PICU?		
Use data in response to the question, how often do you use the Standard Work or Flowsheet when patients are transferred from the ED to the PICU?		

Information exchange data in response to the question, how satisfied are you with the information exchanged during report?		
Information loss data in response to the statement, information “falls between the cracks” when patients are transferred from the ED to the PICU?		
Satisfaction data in response to the question, how satisfied are you with the implementation of a standardized transition process from the ED to the PICU?		
Are barriers present for safe and/or efficient transitions from the ED to the PICU? If so, what are they?	*answers vary	

Appendix Y

RN perception of knowledge of the standardized process, use of the standardized process, satisfaction with information exchanged during handover, information lost during handover and satisfaction with the standardized process

	Mean (SD)			p-Value
Factor	Before (57)	After (34)	Difference	
RN perception of knowledge of the standardized process	47.4 (112.3)	43.6 (112.3)	3.8	0.47
RN perception of use of the standardized process	50.3 (118.1)	38.6 (118.1)	11.7	0.04
RN satisfaction with information exchanged during handover	48.9 (114.9)	41.1 (114.9)	7.8	0.15
RN perception of information lost during handover	46.2 (114.0)	45.6 (114.0)	0.6	0.92
RN satisfaction with the standardized process	51.1 (116.7)	37.4 (116.7)	13.7	0.01

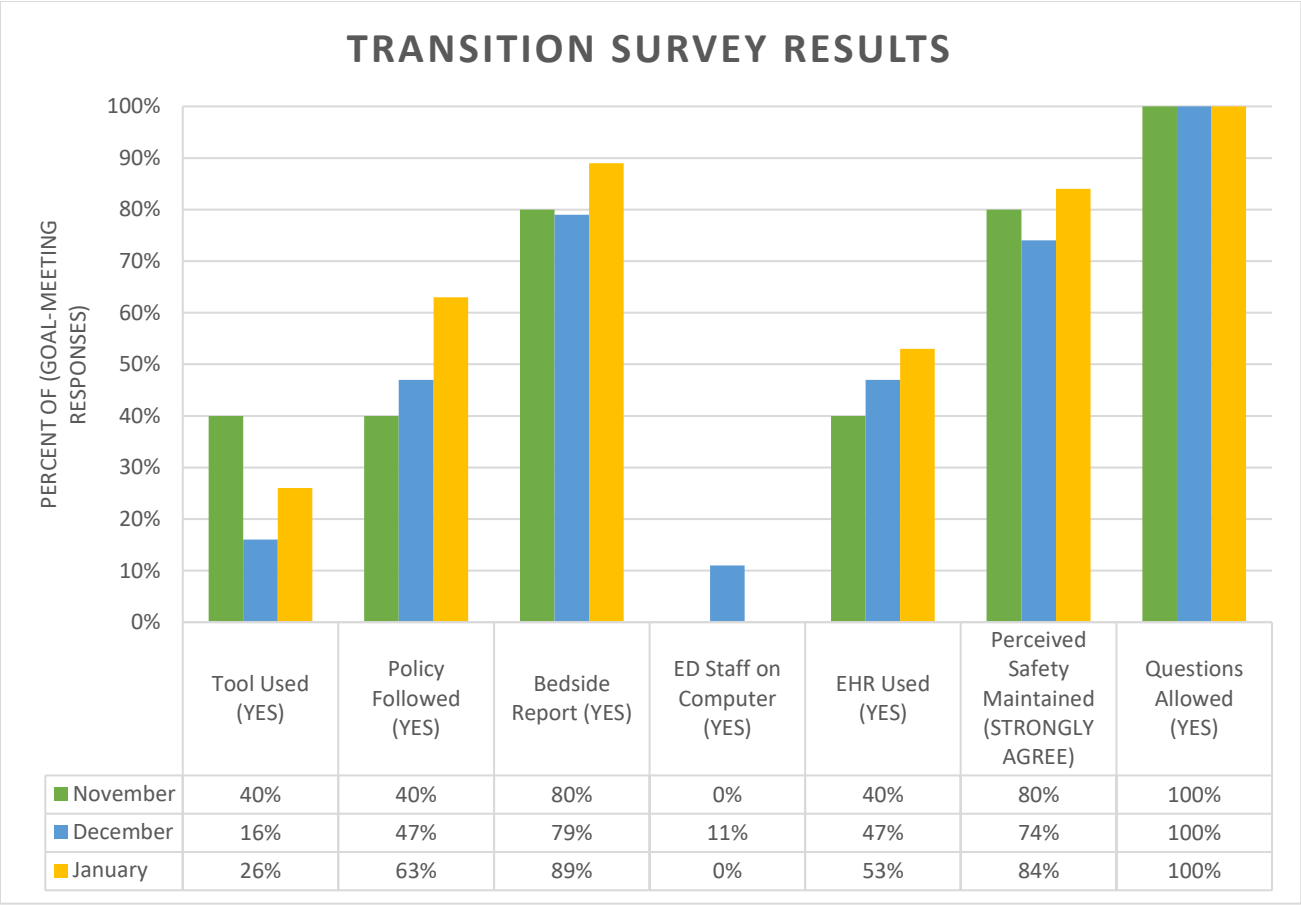
Appendix Z

Response frequencies from the RN transition surveys

Handover Component	% (n)
Admitting patient diagnosis	55.8% (24) Respiratory illness 16.3% (7) Abnormal labs 9.3% (4) Sepsis 7% (3) Seizure 7% (3) Trauma 4.7% (2) Overdose
PICU used standardized process cognitive aid	23.3% (10) Yes 76.7% (33) No
Standardized process policy followed	53.5% (23) Yes 46.5% (20) No
EHR used during handover	48.8% (21) Yes 51.2% (22) No
Staff member who utilized EHR	60.5% (26) PICU RN 32.6% (14) Neither RN 4.7% (2) ED RN 2.3% (1) Both RNs
Bedside handover occurred	83.7% (36) Yes 16.3% (7) No
Time for questions was allowed	100.0% (43) Yes
Patient safety was sustained during and after handover	79.1% (34) Strongly agree 14% (6) Somewhat agree 7% (3) Neutral

Appendix AA

Percent of Responses that Met Goals from the Transition Surveys



	Tool Used (YES)	Policy Followed (YES)	Bedside Report (YES)	ED Staff on Computer (YES)	EHR Used (YES)	Perceived Safety Maintained (STRONGLY AGREE)	Questions Allowed (YES)
November	40%	40%	80%	0%	40%	80%	100%
December	16%	47%	79%	11%	47%	74%	100%
January	26%	63%	89%	0%	53%	84%	100%

Appendix BB

Revised PED Cognitive Aid

Revised 8.23.2018

Time of Admission Order: _____

Inpatient Room Number: _____ **Please place patient sticker here**

Admission/Transfer Checklist

The checklist should be completed by the RN and affirmed by the physician. This is expected to be done at the time of the PEWS scoring and prior to any patient being transported to an in-patient unit or another facility.

1. Are all labs collected?	YES	NO	N/A
2. Are all medications administered/started?	YES	NO	N/A
3. Are all procedures completed?	YES	NO	N/A
4. Are VS done and reviewed?	YES	NO	N/A
5. Has PEWS been documented?	YES	NO	N/A
6. Are all consults done?	YES	NO	N/A
7. Have all concerns been addressed?	YES	NO	N/A
8. Has RT been notified of admission?	YES	NO	N/A
9. (PICU only) ~~Charge~~ Bedside Nurse phone call complete?	YES	NO	N/A
10. (PICU only) Readiness phone call complete?	YES	NO	N/A

****All above questions should be marked "YES." All questions marked "NO" need to be explained and who was notified must be documented.**

BARRIERS GETTING PATIENT TO FLOOR IN <43 MINUTES-CHECK ALL THAT APPLY AND EXPLAIN BELOW:

- ED RN Unavailable
- Med/Pharmacy
- ED Procedure
- Lab
- Room Dirty
- Floor RN Unavailable w/in 10 min
- Social Issues
- Charge RN unavailable after 10 min
- Patient Placement Delay
  - Bed Changed
  - Waiting for Crib/Bed
  - Bed assignment >15 min
- Sedation
- Radiology Procedure
- Admitting Team Delay
- Patient's Condition
- IV
  - Difficult Start
  - Done by Other Dept
  - Ordered by Inpt

COMMENTS/EXPLANATIONS:

RN NAME: _____

PHYSICIAN NAME: _____

WHEN DID PATIENT LEAVE ED?

DATE: _____ TIME: _____

****PLEASE BE SURE DISPOSITION DOCUMENTATION TIME MATCHES THE TIME ABOVE***

Appendix CC

Revised PICU Cognitive Aid

Emergency Department Handoff

Who: ED nurse, PICU nurse(s), ED attending (if appropriate), PICU intensivist (if appropriate), PICU fellow/APP/resident

Before Arrival

- ED ~~Charge~~ bedside RN and PICU Charge discuss room availability and when the room/bed will be ready for patient
- PICU Charge gives the name and number of the RN taking the patient to the ED ~~Charge~~ bedside RN

Initial Phone Call

**Will either come from ED Charge RN or RN caring for the patient in ED

PICU RN obtains the following information:

- Name
- Age
- Weight
- Airway status (intubated yes/no, trach, oxygen needs)

COMMUNICATION:

- Is it safe to bring the patient to the PICU?
- Is the room ready?
  - Suction set up
  - Bag/mask set up
  - Oxygen ready

Upon Arrival

PARK AND BRAKE ED stretcher

Transfer patient to PICU bed

MONITOR:

- Connect patient to PICU monitor
- NT or secondary RN obtains blood pressure

VENTILATOR:

- PICU Intensivist/fellow/APP/resident to check initial vent settings
- Connect patient to PICU ventilator
- RT or RN check for bilateral breath sound

Report

BEDSIDE RN STATES WHEN READY FOR REPORT AND ALL ACTIVITY CEASES DURING REPORT

ED RN gives report using SBAR Format: (offer option of logging in to computer)

- **S**ituation: Why is the patient here?
- **B**ackground: Significant medical history
- **A**ssessment: What interventions did they do in ED and how did the patient respond to those interventions?
  - Last time of sedation, pain meds or paralytics
  - Fluid bolus amounts and time(s)
  - Drips/infusions that are currently running
- **R**ecommendation: Plan for the patient and any outstanding orders that didn't get completed by ED RN.

PICU RN asks any remaining questions
ED RN leaves Ascom number for PICU RN

Improving Patient Handover from the PED to the PICU

Kathryn DeVinney

DNP Project Defense

April 16, 2019

Grand Valley State University
Kirkhof College of Nursing

Acknowledgements

- Sandra L. Spoelstra, PhD, RN, FGSA, FAAN
  - Advisor
- Marie VanderKooi, DNP, RN
  - Committee Member
- Caryn Steenland, MSN, RN, CCRN, ACCNS-P
  - Organizational Mentor

Objectives for Presentation

1. Review the clinical problem
2. Review the organizational assessment and current literature concerning issues identified
3. Review the project plan
4. Discuss quality improvement project results, practice implications, and organizational next steps
5. Discuss application of DNP Essentials to project

Introduction

- Two million pediatric hospitalizations occur annually[1]
- Multiple organizations have identified handover as a safety concern[2]
  - Harm potential increases in high risk areas[3,4]
  - Between-unit handovers pose additional problems[5]
  - Handout 1
- Poor communication[6,7]
  - 64% of hospital sentinel events
  - $1.7 billion in malpractice costs over five years

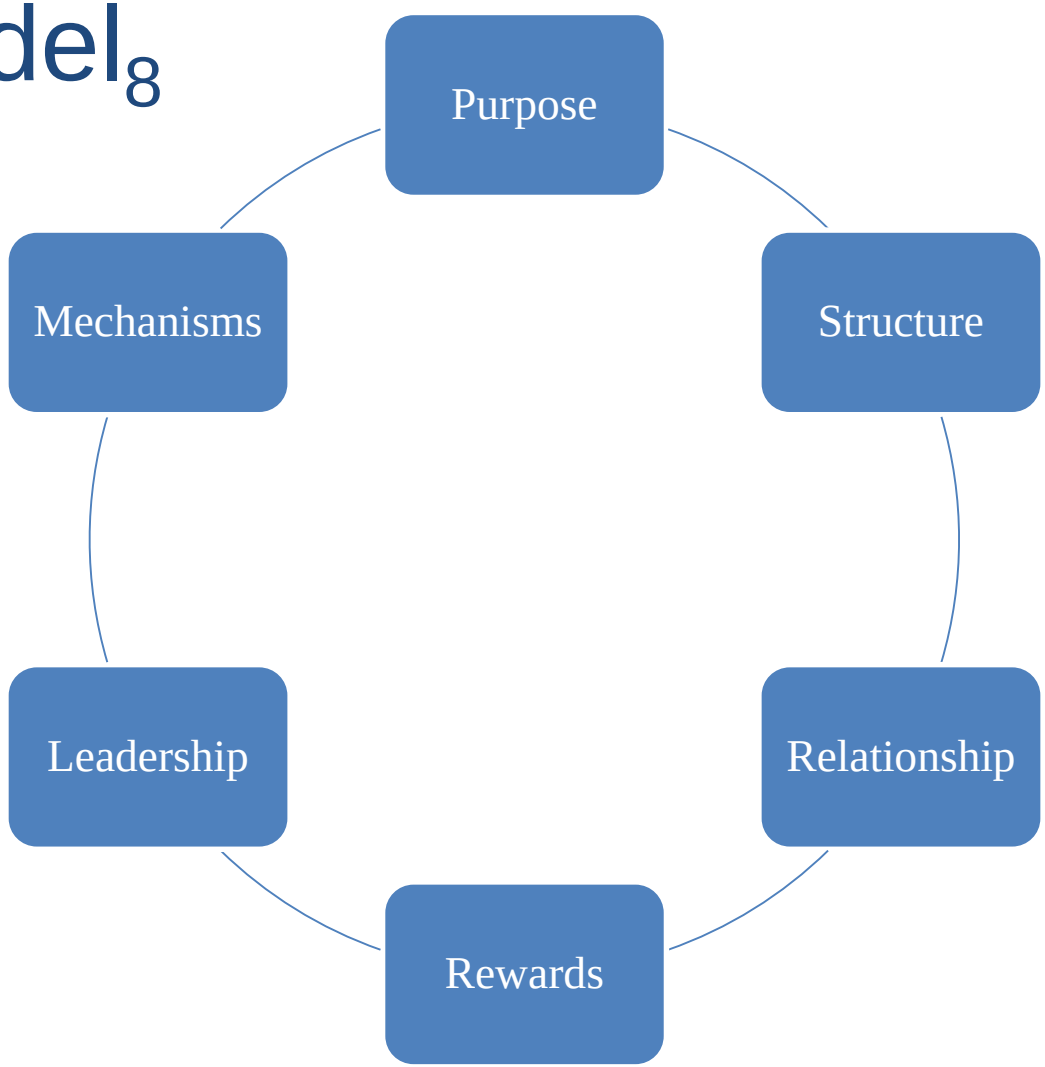
World Health Organization

The Joint Commission

IOM Institute of Medicine

ORGANIZATIONAL ASSESSMENT

Six-Box Model[8]



Six-Box Model[8]

- Diagnostic framework
- Informed through observation and surveys
- Selected for functionality
  - Pediatric Emergency Department (PED)
  - Pediatric Intensive Care Unit (PICU)

1. PURPOSE
2. STRUCTURE
   - HANDOUT 2
3. RELATIONSHIP
4. REWARDS
5. LEADERSHIP
6. MECHANISMS
   - HANDOUT 3

SWOT Analysis[9]

STRENGTHS	WEAKNESSES
• **Standardized transition process** • **SBAR** • **Cognitive aid** • Clinical nurse specialists • Shared leadership teams	• **Cognitive aid** • **Sustaining mechanisms** • Differing care models • Lack of reward system
OPPORTUNITES	**THREATS**
• Care transition previously addressed • Epic professional handoff view	• **Varying handover processes**

Current State: Survey (Handout 4)

Response rate 36% (60 of 168)

Knowledge:

- Very good/somewhat good- PED(84%), PICU(61%)
- Education needed

Use:

- Always/most of the time- PED(50%), PICU(33%)
- Overall, low use

Information exchange:

- Very/somewhat satisfied- PED(67%), PICU(33%)
- Handover content should be improved

Information loss:

- Strongly/somewhat agree- PICU(70%)
- Safety concern

Satisfaction:

- Very/somewhat unsatisfied- PED(37%), PICU(11%)

Barriers to efficient and safe patient transition identified by PED and PICU

Knowledge Gained

- Handover content
- Electronic health record
- Cognitive aid
- Care models
- Sustaining change

Clinical Practice Question

- What is the effect of an improved standardized handover process with use of a cognitive aid on transition outcomes?

Stakeholders$_9$

- Registered nurses (RN)
- Clinical Nurse Specialists
- Patients & Families

IRB Approval

GRAND VALLEY STATE UNIVERSITY
www.gvsu.edu

DATE: July 18, 2018

TO: Sandra Spoelstra
FROM: HRRC
STUDY TITLE: Patient Handoff in a Children's Hospital from the Emergency Department to the Critical Care Unit:
A Quality Improvement Project
REFERENCE #: 19-025-H
SUBMISSION TYPE: HRRC Research Determination Submission

ACTION: Not Research
EFFECTIVE DATE: July 18, 2018
REVIEW TYPE: Administrative Review

Thank you for your submission of materials for your planned scholarly activity. It has been determined that this project does not meet the definition of research* according to current federal regulations. The project, therefore, does not require further review and approval by the Human Research Review Committee (HRRC).

A summary of the reviewed project and determination is as follows:

The purpose of this project is to improve the handoff of pediatric patients being admitted to the PCCU from the pediatric ED in a local hospital, thus increasing patient safety and staff satisfaction. While this is a systematic investigation, it is not designed to create new generalizable knowledge. Therefore, this project does not meet the federal definition of research and no IRB oversight is needed.

An archived record of this determination form can be found in IRBManager from the Dashboard by clicking the "_ xForms" link under the "My Documents & Forms" menu.

If you have any questions, please contact the Office of Research Compliance and Integrity at (616) 331-3197 or rci@gvsu.edu. Please include your study title and study number in all correspondence with our office.

Sincerely,
Office of Research Compliance and Integrity

*Research is a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge (45 CFR 46.102 (d)).

Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains: data through intervention or interaction with the individual, or identifiable private information (45 CFR 46.102 (f)).

Scholarly activities that are not covered under the Code of Federal Regulations should not be described or referred to as *research* in materials to participants, sponsors or in dissemination of findings.

Office of Research Compliance and Integrity | 1 Campus Drive | 049 James H Zumberge Hall | Allendale, MI 49401
Ph 616.331.3197 | rci@gvsu.edu | www.gvsu.edu/rci

Association for the Accreditation of Human Research Protection Programs, Inc. — Full Accreditation

[redacted]

NON HUMAN RESEARCH DETERMINATION

July 16, 2018

Kathryn Shanklin, BSN

[redacted]

PROTOCOL TITLE: **Patient Handoff in a Children's Hospital from the Emergency Department to the Critical Care Unit:**
A Quality Improvement Project

SPONSOR: Investigator

Dear Shanklin,

On July 16, 2018, the above referenced project was reviewed. It was determined that the proposed activity does not meet the definition of research as defined by DHHS or FDA.

Therefore, approval [redacted] is not required. This determination applies only to the activities described in the IRB submission and does not apply if changes are made. If changes are made and there are questions about whether these activities are research involving human subjects, please submit a new request to the IRB for a determination.

A quality improvement project may seek publication. Intent to publish alone is insufficient criterion for determining whether a quality improvement activity involves human subject research. However, please be aware when presenting or publishing the collected data that it is presented as a quality improvement project and not as research.

Please be advised, this determination letter is limited to IRB review. It is your responsibility to ensure all necessary institutional permissions are obtained prior to beginning this project. This includes, but is not limited to, ensuring all contracts have been executed, any necessary Data Use Agreements and Material Transfer Agreements have been signed, documentation of support from the Department Chief has been obtained, and any other outstanding items are completed (i.e. CMS device coverage approval letters, material shipment arrangements, etc.).

Your project will remain on file with the Office of the IRB, but only for purposes of tracking research efforts within th[redacted] If you should have questions regarding the status of your project, please contact the Office of the IRB [redacted]

Sincerely,

[redacted]

GRAND VALLEY STATE UNIVERSITY
KIRKHOF COLLEGE OF NURSING

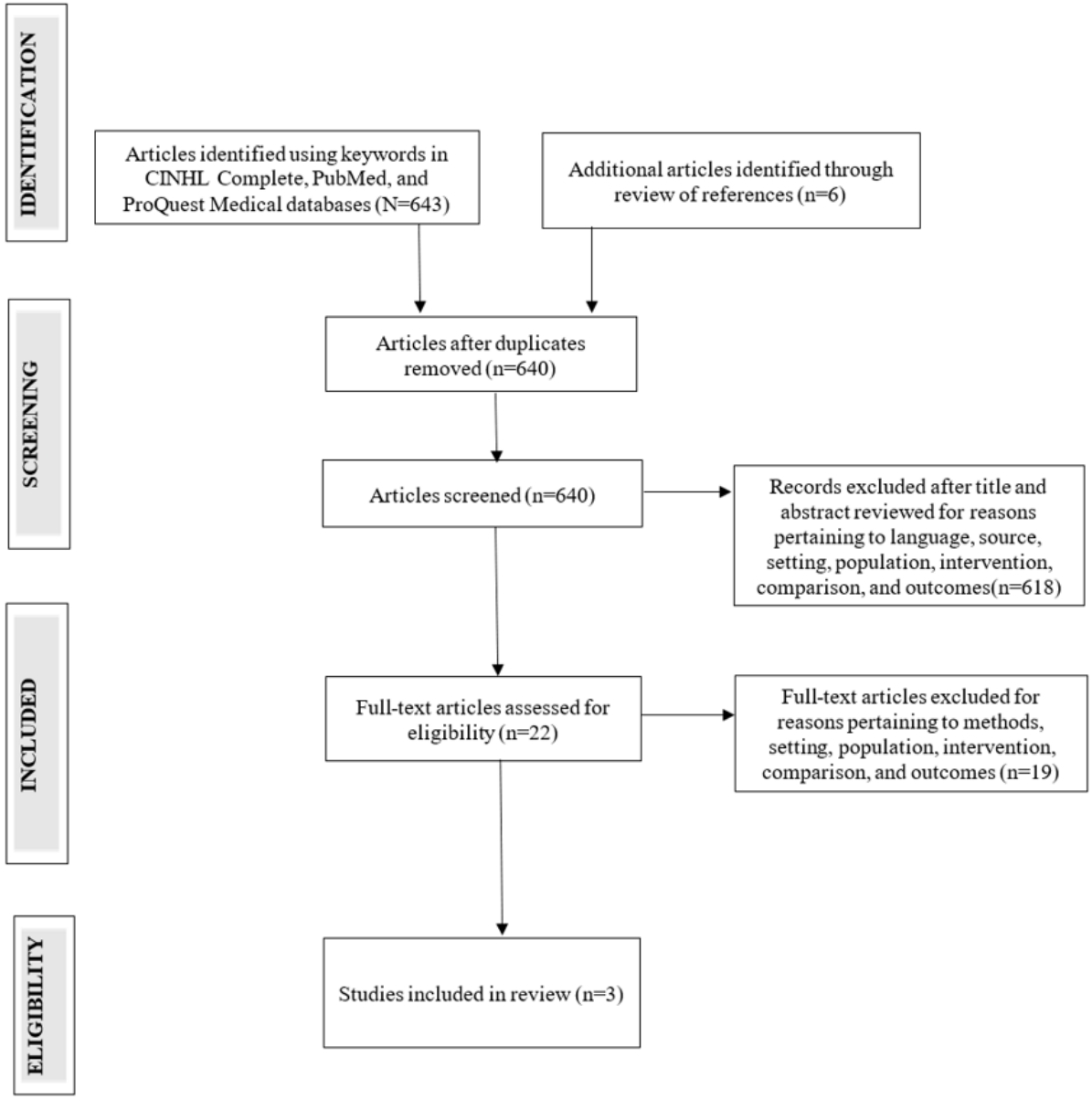
LITERATURE REVIEW

Literature Review

- Aim
  - Report outcomes of standardized handover process
  - Interventions associated with success of process
- Focus
  - Patient transition between high risk areas
- Method
  - Integrative review
  - Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [10]
  - CINAHL Complete, PubMed, ProQuest Medical

Keywords:

"emergency department OR emergency room AND intensive OR critical AND handover OR handoff"



PRISMA Figure[10]

Author	Design	Results	Conclusion
Bergs (2018) evaluated a structured handover process and educational intervention aimed at emergency and intensive care unit(ICU)/ ward nurses.	Quasiexperimental nonequivalent control group pre/posttest study (1 Belgian general hospital)	Post-intervention: The significant change that occurred was an increase in the emergency department nurses' evaluation of interaction/support ($p=0.04$).	Intervention facilitated increased understanding and positive attitudes towards the handover process.
Bigham (2014) evaluated the effect of a multihospital attempt to decrease care failures related to handovers.	Quasiexperimental, nonequivalent control group pre/posttest study (43 children's hospitals, N=7,864 handovers)	69% reduction in care failures from baseline to final assessment ($p<0.05$); All three process measures improved; Compliance improved from 87% to 94% ($p<0.05$); Staff satisfaction increased from 55% to 70% ($p<0.05$).	Improvements were attained across multiple hospitals without decreasing staff satisfaction. High performing hospitals included provided a cognitive aid for staff members.
Lautz (2018) evaluated if the use of ABC-SBAR, a handover tool, would improve information transmission during simulated pediatric emergencies.	Prospective, randomized, pre/posttest study (Urban, quaternary academic children's hospital, intervention, N=20)	There was a posttest difference between the control and intervention group ($p<0.01$).	Standardized handover, in addition to training and a cognitive aid, may increase inclusion of essential patient information during the handover of a critically ill pediatric patient.

Summary of Table[2,11,12]

Evidence for Project

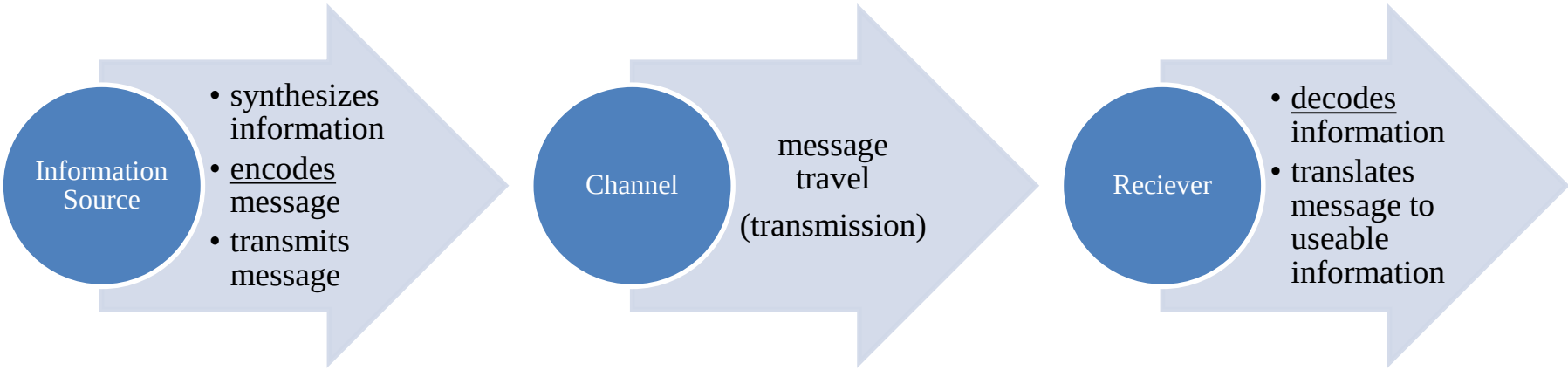
- Standardized handover process may improve patient safety and RN satisfaction[2,11,12]
- A standardized handover process with a cognitive aid could reduce the incidence of handover failures and increase compliance[2,12]
- The Joint Commission compliance[7]
  - PC.02.02.01
  - PI.03.01.01

PROJECT PLAN

Problem Statement

- A standardized process with a cognitive aid had been implemented in the children's hospital (CH) which required additional evaluation and implementation strategies to further improve the process.

Phenomenon Model: Linear Model of Communication[13,14]

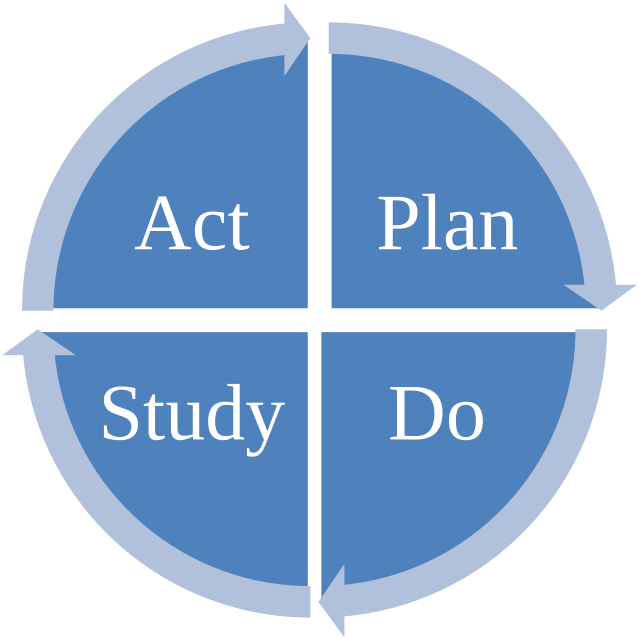


Project Purpose & Objectives

Purpose: Continue the quality improvement process

- Objectives:
  1) To develop a guiding team of stakeholders.
  2) To educate RNs on the standardized process and use of the cognitive aid.
  3) To make the electronic health record (EHR) available to PED RNs during the bedside handover process.
  4) To evaluate the standardized process with cognitive aid in the PED and PICU
  5) To design and implement a sustainability plan
  6) To address issues identified throughout the evaluation process

Design

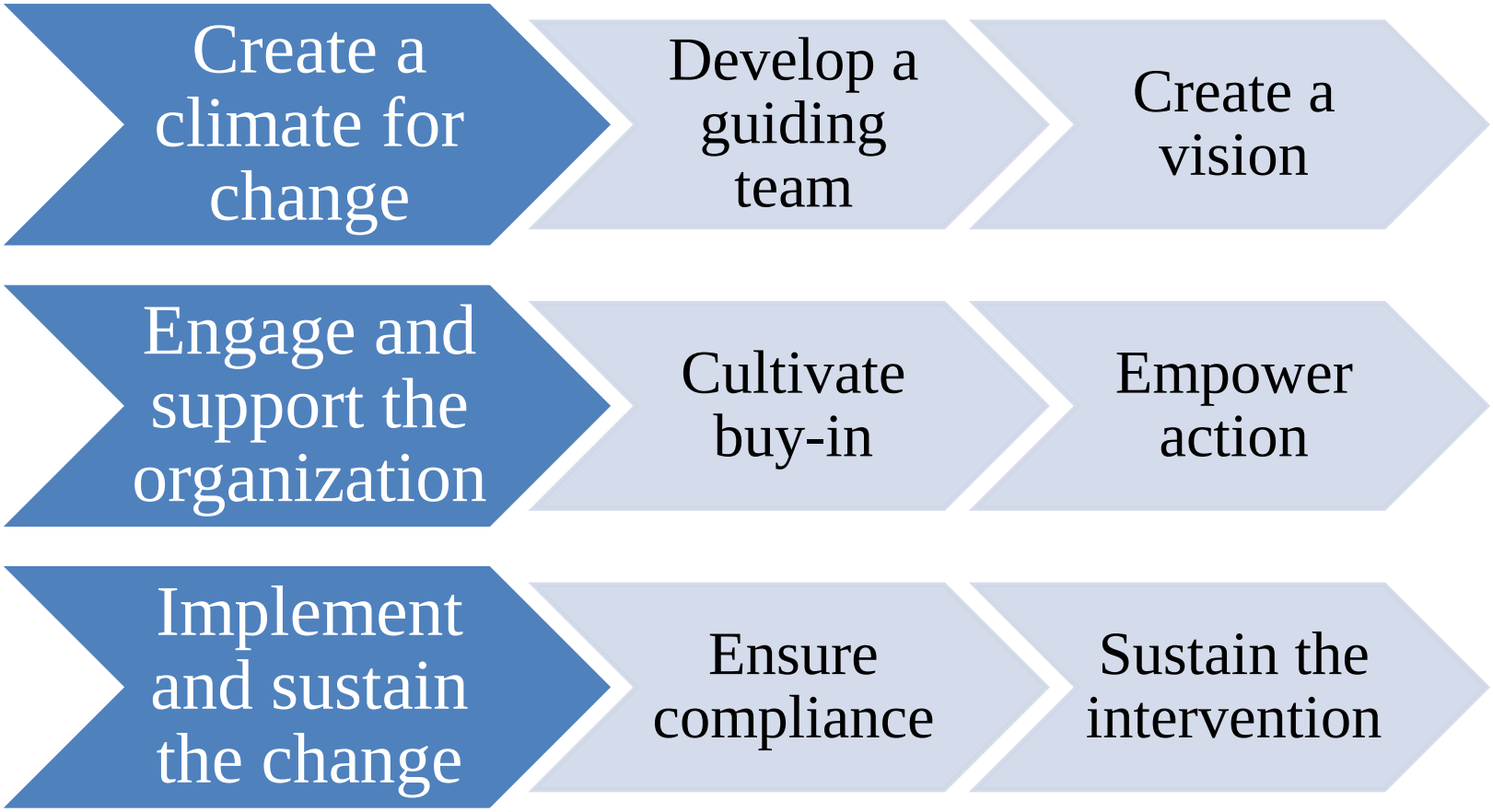


- Quality improvement project
  - Translation of evidence-based practice
  - Evaluation of target outcomes
- Two cycles of Plan, Do, Study, Act Model[15] (PDSA)
  - Plan: proposal
  - Do: implementation strategies
  - Study: data collection and analysis
  - Act: sustain and disseminate findings

Setting & Participants

- Free-standing CH in the Midwest
  - Magnet status & nationally ranked[16]
- PED:
  - 54,000 patients annually[17]
  - 35-bed unit
- PICU:
  - 24-bed unit; cares for critically ill medical and surgical patients[17]
- Participants:
  - RNs (168)
    - PICU RNs: 102
    - PED RNs: 66
  - Patient & Families
    - 530 admissions to the PICU annually[18]
    - 1% of PED patient admitted to PICU

Implementation Model: Kotter Model[19]



IMPLEMENTATION STRATEGIES & ELEMENTS

Implementation Strategy #1

- Organizational Assessment
  - Assessment of readiness[20]
  - Identified barriers, facilitators, and needs[20]

Implementation Strategy #2

- Expert Involvement
  - Shadowed an expert during the organizational assessment[20]
  - Expert advisor[20]
  - Development of a coalition[20]
    - Section 1 of Handout 7 was created by PICU

Implementation Strategy #3

- Cognitive Aid
  - Altered allowance structures[20]
    - Section 2 of Handout 7
  - Developed and implemented the aid/tool to prompt data collection[20]
    - Section 2 of Handout 7
  - Developed and organized a system for quality monitoring[20]
    - Section 2 of Handout 7
  - Audit and feedback[20]
    - Section 3 of Handout 7
  - Identified early adopters[20]
    - Section 3 of Handout 7

Implementation Strategy #4

- Quality Improvement and Change Model
  - Conducted cyclical small tests of change[20]
  - Examined implementation[20]

Implementation Strategy #5

- Education Provision
  - Developed and distributed educational materials$_{20}$
  - Conducted education$_{20}$
  - Provided ongoing training$_{20}$
  - Example: Handout 8

Measures

Demographic data
- Unit of employment
- Shift

Patient outcome measures
- Late/missed/incorrect meds
- Time to antibiotic is patients on a sepsis pathway
- Falls

Perception measures
- Sustained safety during/after handover
- Barriers to patient safety
- Frequency of handover process use
- Knowledge of process
- Information quality
- Information loss

Satisfaction measures
- RN
- Patient proxy

Implementation measure
- Event reports

System measures
- Conversion time
- Use
  - Call #1
  - Call #2
  - Cognitive aid use PED & PICU
  - Compliance with process
  - EHR use
  - Beside report
  - Staff member on computer
  - Time for questions

Evaluation

Event Reports

Late/Missed/Incorrect Medications - Implementation Measure

PRE-DATA: [1.1.18→3.31.18]
POST-DATA: [1.1.19→1.31.19]

Organizational Data

Conversion time - Antibiotic administration time
Patient proxy satisfaction - Falls

PRE-DATA: [1.1.18→3.31.18]
POST-DATA: [12.1.18→12.31.18]

Organizational Data [cognitive-aid-dependent]

Call #1 - Call #2
Cognitive aid use in PED

PRE-DATA: [9.1.18→10.31.18]
POST-DATA: [1.1.19→1.31.19]

Pre-/Post-Survey (Handout 10)

Unit of employment - Safety barriers - Information quality - Process use
Shift - Information loss - Process knowledge - RN satisfaction

PRE-DATA: [8.1.18→ 8.18.18]
POST-DATA: [1.21.19→2.5.19]

Transition Survey (Handout 11)

Cognitive aid use in PICU - Process Compliance - Bedside report
Sustained safety - Computer/EHR use - Time for questions

[11.19.18→ 1.31.19]

Analysis Plan

- Descriptive Statistics
- Chi-square test
  - Analyze relationship between categorical data
  - Significance will be classified as a

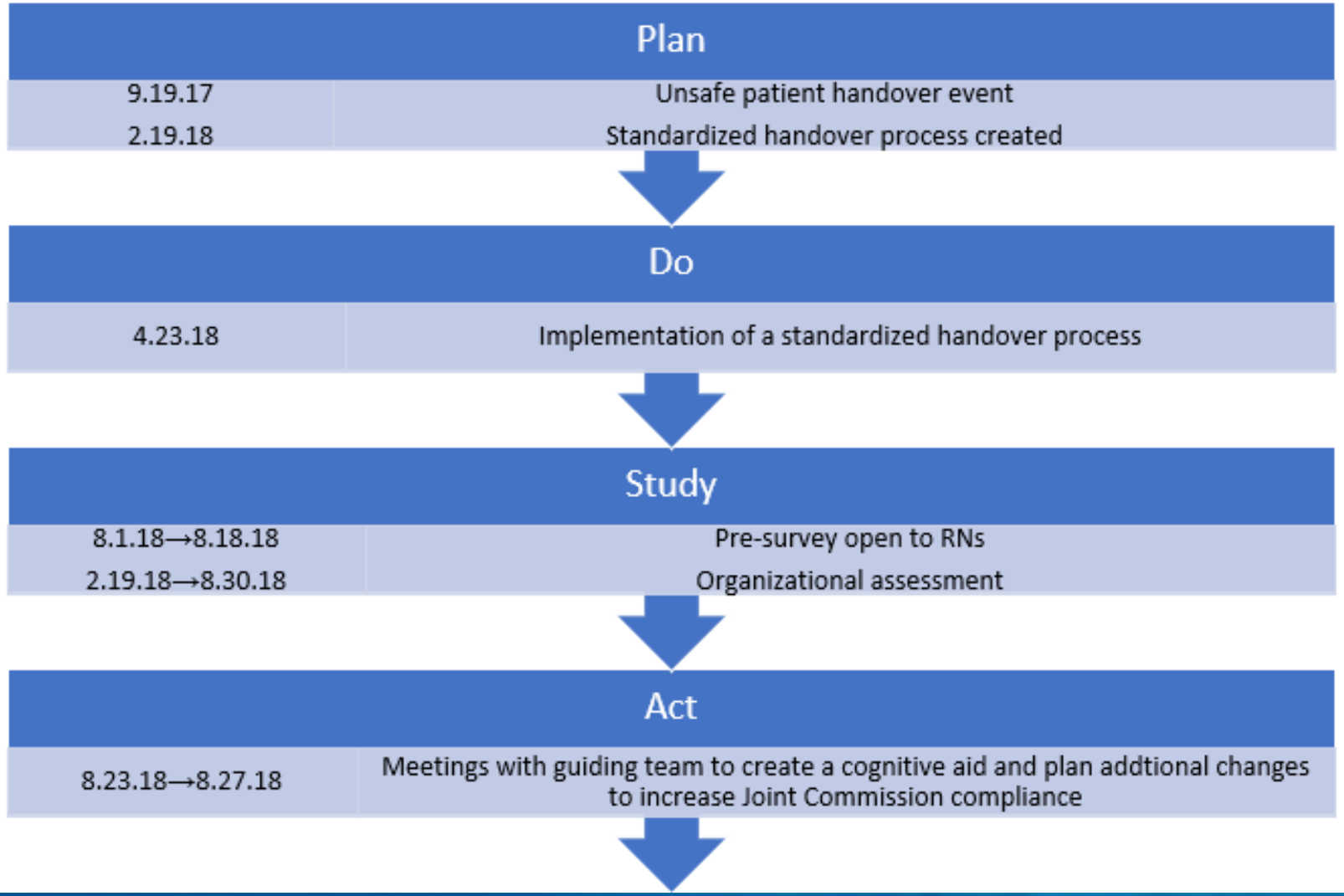
    p-value ≤ 0.05
- Wilcoxon-signed rank
  - Analyze relationship between numerical data
  - Significance will be classified as a

    p-value ≤ 0.05

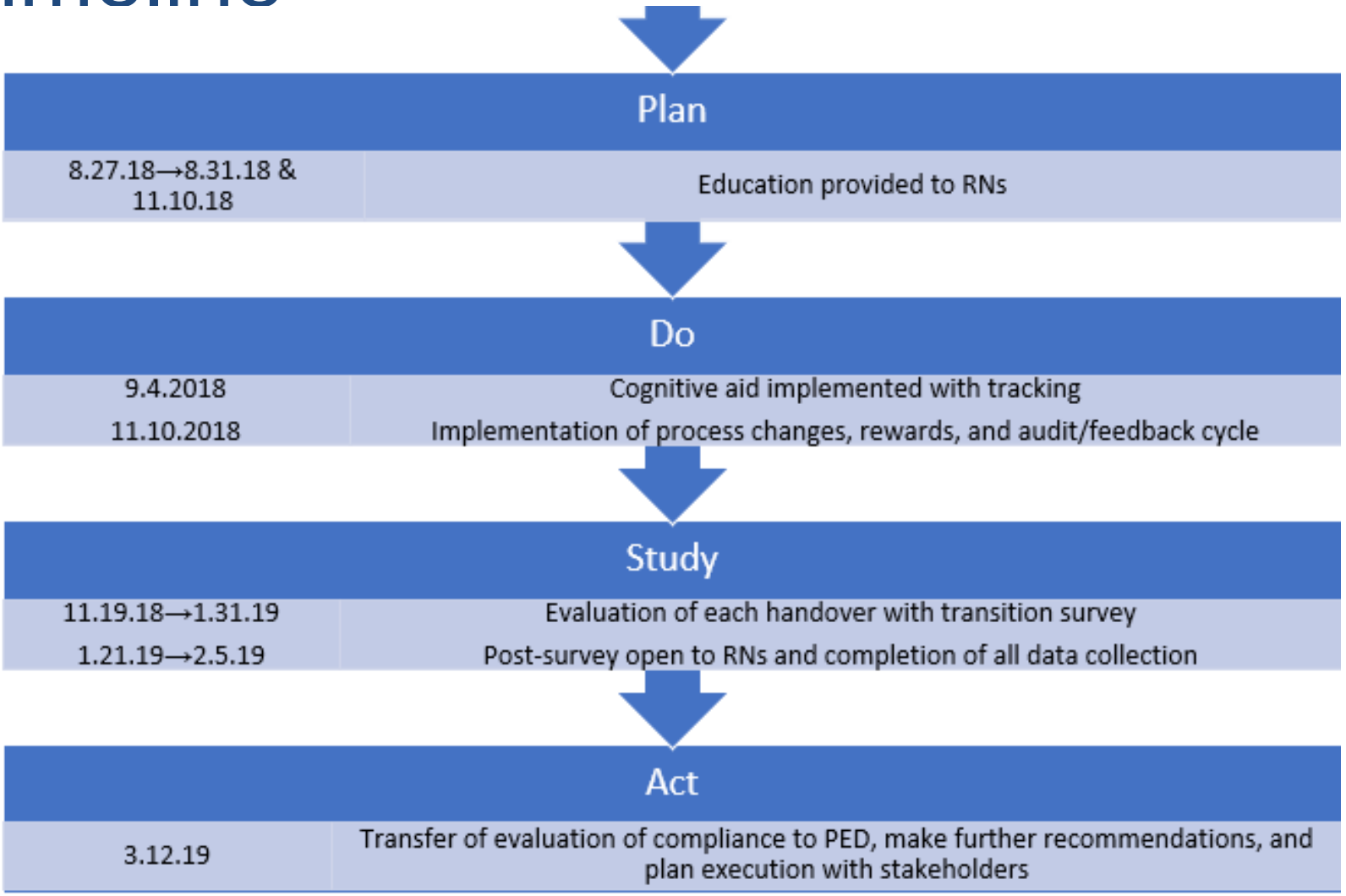
Target Outcomes

INCREASE	• Use of standardized process • RN satisfaction • Patient proxy satisfaction
DECREASE	• Late/missed/incorrect medications • Time to antibiotic • Conversion time • Falls • Number of event reports submitted
IMPROVE RN PERCEPTION	• Use of the standardized process • Patient safety • Knowledge of standardized process • Information exchanged during report

Timeline


Plan
9.19.17
Unsafe patient handover event
2.19.18
Standardized handover process created
Do
4.23.18
Implementation of a standardized handover process
Study
8.1.18→8.18.18
Pre-survey open to RNs
2.19.18→8.30.18
Organizational assessment
Act
8.23.18→8.27.18
Meetings with guiding team to create a cognitive aid and plan addtional changes to increase Joint Commission compliance

Timeline


Plan
8.27.18→8.31.18 & 11.10.18
Education provided to RNs
Do
9.4.2018
Cognitive aid implemented with tracking
11.10.2018
Implementation of process changes, rewards, and audit/feedback cycle
Study
11.19.18→1.31.19
Evaluation of each handover with transition survey
1.21.19→2.5.19
Post-survey open to RNs and completion of all data collection
Act
3.12.19
Transfer of evaluation of compliance to PED, make further recommendations, and plan execution with stakeholders

Resources & Budget

Doctor of Nursing Practice Project Financial Operating Plan Improving the Patient Handover from a PED to a PICU Using a Cognitive Aid	
POTENTIAL COST SAVINGS	
Cost mitigation	
ESC submission to The Joint Commission	$ 10,000.00
RN turnover	$ 9,000.00
Prevention of 1 inpatient medication error (median cost)	$ 1,000.00
POTENTIAL COST SAVINGS TOTAL	$ 20,000.00
EXPENSES	
Project Expenses (Including Donated Resources)	
Project Manager Time	$ 5,000.00
Team Member Time:	
Clinical Nurse Specialist (2)	$ 720.00
Registered Nurses (Time Spent Completing Questionnaires)	$ 900.00
Education:	
Charge Nurses (one-time)	$ 120.00
Registered Nurses (two-times)	$ 1,255.00
Consultations:	
Statistician	$ 100.00
Qualtrics online software	$ 1,500.00
Laptop	$ 400.00
Cost of print/copy/fax	$ 5.00
Project Expenses Total (Including Donated Resources)	$ 10,000.00
Donated Resoures	
Project Manager Time	$ (5,000.00)
Statistician	$ (100.00)
Laptop	$ (400.00)
Qualtrics online software	$ (1,500.00)
Donated Resources Total	-7,000.00
TOTAL EXPENSES INCURED BY HOSPITAL	$ 3,000.00

RESULTS & SUSTAINABILITY

Results

Conversion Time in the PED Comparison

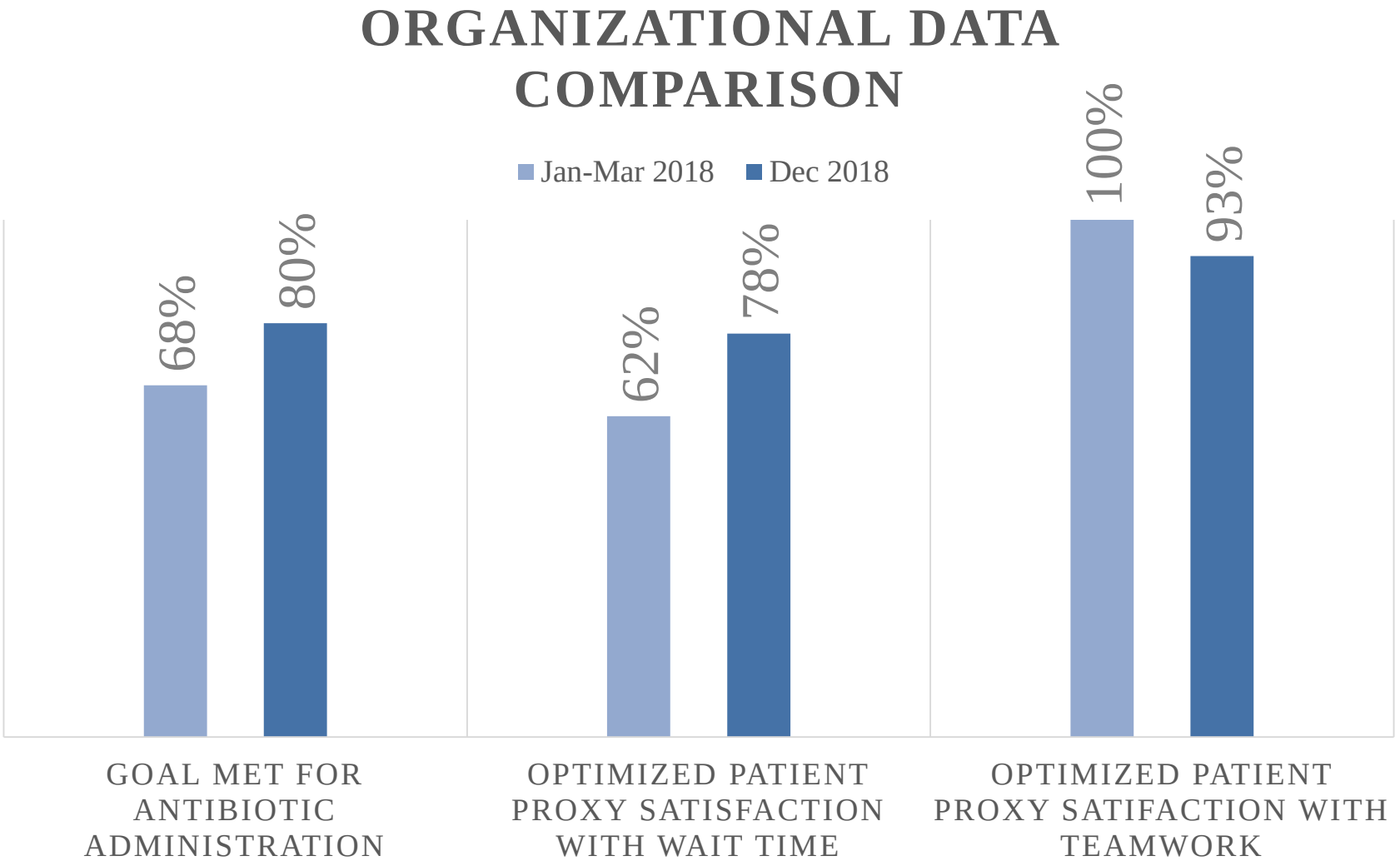
	% (n)			
	Before	After	Difference	p-Value
<43 minutes	45.0% (50)	44.7% (17)	(0.3%)	0.97
>43 minutes	55.0% (61)	55.3% (21)	0.3%	

Results

Organizational Data Comparison

	% (n)			p-Value
Factor	Before	After	Difference	
Goal met for antibiotic administration for SEPSIS	68% (17) Yes 32% (8) No	80% (4) Yes 20% (1) No	12%	-
Patient proxy satisfaction with wait time admission PED to PICU	61.8% (47) Yes 38.1% (29) No	78.3% (18) Yes 21.7% (5) No	16.5%	0.15
Patient proxy satisfaction with staff Teamwork in PICU	100% (5) Yes	92.9% (13) Yes 7.1% (1) No	(7.1%)	-

Results

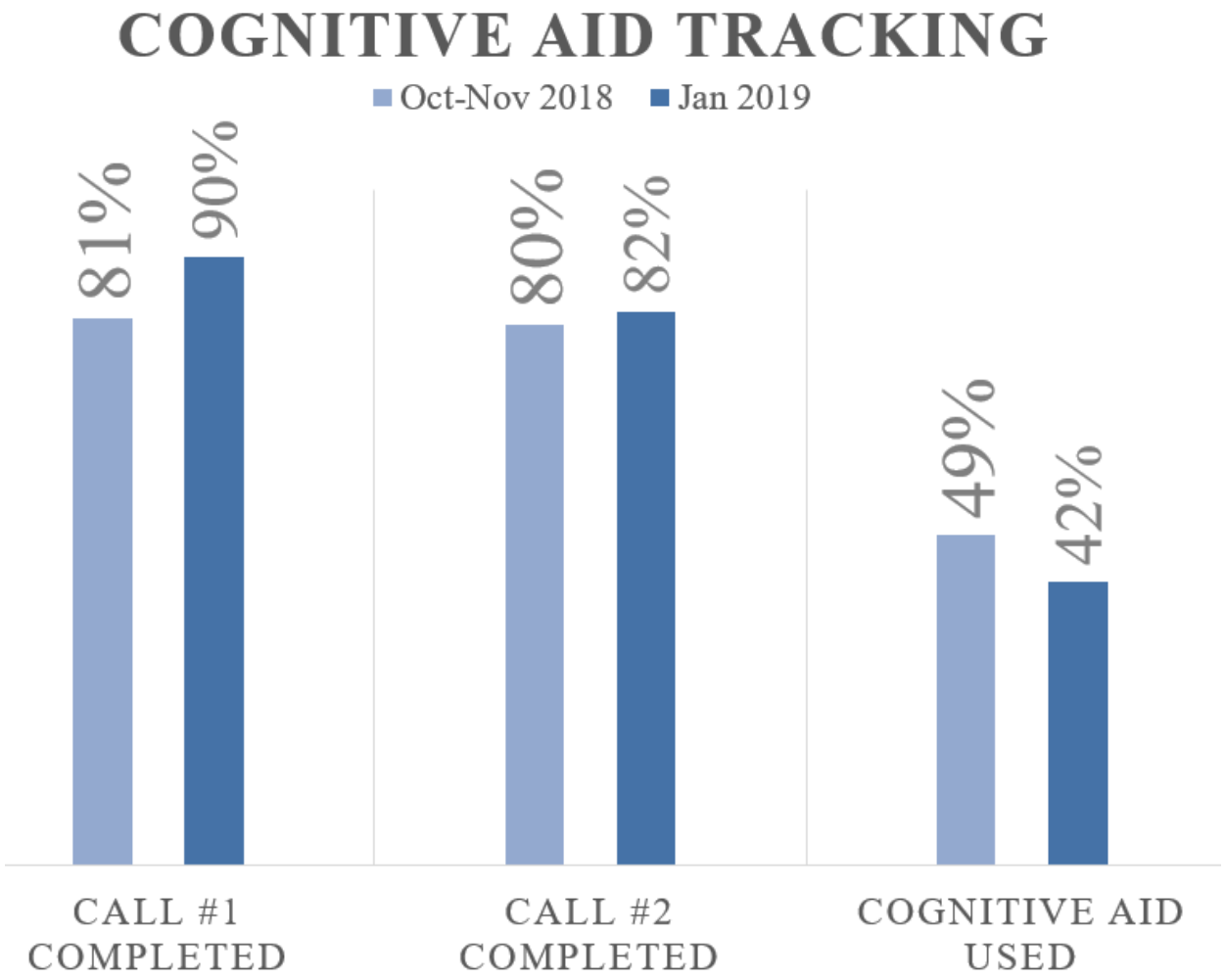

ORGANIZATIONAL DATA COMPARISON
Jan-Mar 2018
Dec 2018
68%
80%
62%
78%
100%
93%
GOAL MET FOR ANTIBIOTIC ADMINISTRATION
OPTIMIZED PATIENT PROXY SATISFACTION WITH WAIT TIME
OPTIMIZED PATIENT PROXY SATIFACTION WITH TEAMWORK

Results

Allowance Structure Analysis Comparison

PED Cognitive Aid Collected Data			
	% (n)		
	Before	After	Difference
Call #1 completed	81.3% Yes (65) 18.8% No (15)	89.5% Yes (34) 10.5% No (4)	8.2%
Call #2 completed	80.0% Yes (64) 20.0% No (16)	81.6% Yes (31) 18.4% No (7)	1.6%
Cognitive aid used	48.8% Yes (39) 51.3% No (41)	42.1% Yes (16) 57.9% No (22)	(6.7%)
Conversion time goal met (<43 mins)	40.0% Yes (32) 60.0% No (48)	44.7% Yes (17) 55.3% No (21)	4.7%

Results


COGNITIVE AID TRACKING
Oct-Nov 2018
Jan 2019
81%
90%
80%
82%
49%
42%
CALL #1 COMPLETED
CALL #2 COMPLETED
COGNITIVE AID USED

Results

Staff Survey Response Comparison

	Mean (SD)			p-Value
Factor	Before (57)	After (34)	Difference	
RN perception of knowledge of the standardized process	47.4 (112.3)	43.6 (112.3)	3.8	0.47
RN perception of use of the standardized process	50.3 (118.1)	38.6 (118.1)	11.7	0.04
RN satisfaction with information exchanged during handover	48.9 (114.9)	41.1 (114.9)	7.8	0.15
RN perception of information lost during handover	46.2 (114.0)	45.6 (114.0)	0.6	0.92
RN satisfaction with the standardized process	51.1 (116.7)	37.4 (116.7)	13.7	0.01

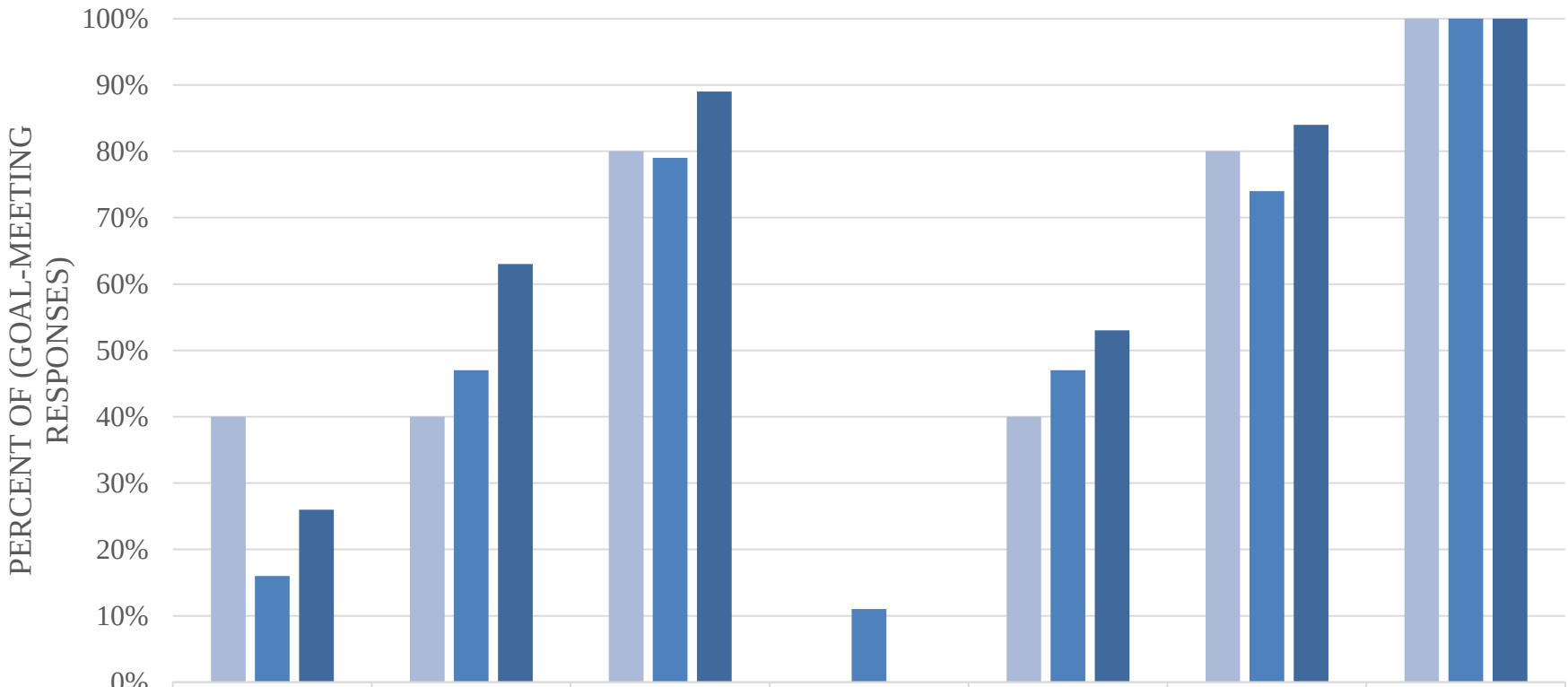
See Handout 13 for response distribution

Results

Transition Survey Responses

Admitting Diagnosis of Patient	% (n)
Respiratory Illness	55.8% (24)
Abnormal Labs	16.3% (7)
Sepsis	9.3% (4)
Seizure	7.0% (3)
Trauma	7.0% (3)
Overdose	4.7% (2)

TRANSITION SURVEY RESULTS (Handout 14)



	Tool Used (YES)	Policy Followed (YES)	Bedside Report (YES)	ED Staff on Computer (YES)	EHR Used (YES)	Perceived Safety Maintained (STRONGLY AGREE)	Questions Allowed (YES)
November	40%	40%	80%	0%	40%	80%	100%
December	16%	47%	79%	11%	47%	74%	100%
January	26%	63%	89%	0%	53%	84%	100%

Discussion

Outcomes

Positive

- Standardized process use
- Use of cognitive aid in PED
- RN and patient proxy satisfaction
- PED knowledge of process
- Satisfaction with information exchange
- Bedside report occurrence
- Use of EHR

Neutral

- Conversion time
- PED computer use
- Time to antibiotic administration
- Falls
- Medication errors
- Time for questions allowed following handover

Poor

- PICU knowledge of process
- Perception of information loss in handover
- PICU use of cognitive aid

Discussion

- Standardized process use
- RN and patient proxy satisfaction
- Knowledge of process disparity
  - Influence of implemented tools and workflow
  - Target use of cognitive aid in PICU
- Uncovered perception complications

Sustainability Plan

- Track compliance
  - Built into cognitive aid
  - RN already on payroll for analyzing this aid
- Continue improvements
  - PDSA third cycle

Recommended/Planned Next Steps

- Third cycle of PDSA
  - Update standardized process and aids
    - Handout 15 and 16
  - Evaluate change to handover process
  - Conversion time tracking
  - Evaluate education in PICU
  - Possibly plan additional proposed change to handover process
- Cognitive aid periodic evaluation and tracking
- Shadowing

CONCLUSIONS

Limitations

- Clinically significant findings
- Limited statistical analysis available
  - Small sample size
  - Zeros
- Measurement imprecision
  - Adjustment for small sample size
  - Surveys
- Internal validity and generalizability

Implications for Practice

- Spread to other contexts
  - Limited generalizability
  - Adapt PED/PICU cognitive aid
- Further studies needed
  - Evaluation of specific standardized handover procedures
  - With the CH
    - Perception issues
    - Evaluation of information loss in handover

Implementation Strategies

- Cognitive Aid
  - Altered allowance structures[20]
  - Developed and organized a system for quality monitoring[20]
  - Workflow wins
- PDSA model
  - Conducted cyclical small tests of change[20]
  - Examined implementation[20]
  - Flexibility
  - Transfer ease

Dissemination

- ✓Stakeholder meeting within the CH
- ✓Poster symposium at organization
- ✓Public defense
- ✓Submission to ScholarWorks

DNP Essentials

DNP Essentials

Essential I: Scientific Underpinnings for Practice

- Model and framework use
- Literature review
- Evidence-based intervention

Essential II: Organizational and Systems Leadership

- Sustainability plan
- Implementation strategies

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

- Analytic techniques
- Comprehensive data collection and evaluation
- Findings disseminated

Essential IV: Information Systems and Technology

- Use of technology within project

DNP Essentials

Essential V: Advocacy for Health Care Policy

- Critical appraisal of The Joint Commission policies
- Advocacy for nursing staff

Essential VI: Interprofessional Collaboration

- Interdisciplinary collaboration and communication
- Bridge between units

Essential VII: Clinical Prevention and Population Health

- Evaluation of care delivery model and determined appropriate interventions
- Project addressed the population of interest

Essential VIII: Advanced Nursing Practice

- Clinical and leadership judgement in complex health situations
- Developed and sustained relationships
- Active involvement in the organization

Summary

- The purpose of this project was to implement and evaluate an optimized standardized process for patient handover in the PED and PICU with a cognitive aid
- Phenomenological, quality improvement, and change models were utilized to direct the project
  - Statistically and clinically significant improvement
  - Multiple evidenced-based, and tailored implementation strategies
- Third cycle of the PDSA model recommended and planned
- Demonstrates mastery of the DNP Essentials

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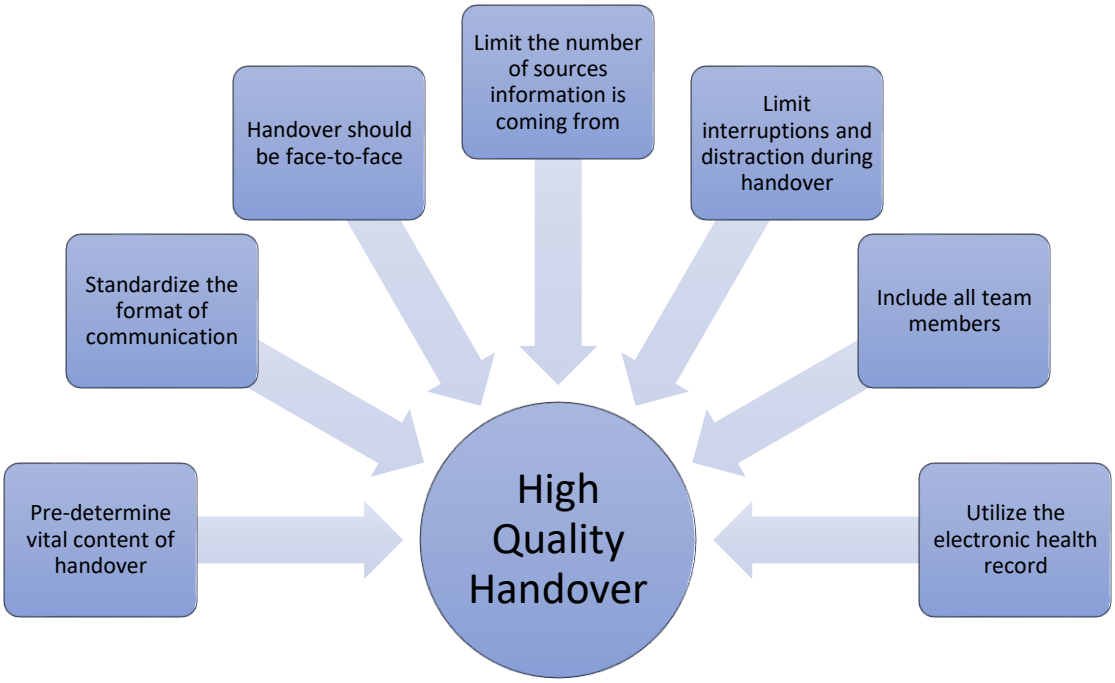
QUESTIONS

Handout #1

The Joint Commission Handover Components



Adapted from "Inadequate hand-off communication," by The Joint Commission, 2017. Retrieved from https://www.jointcommission.org/assets/1/18/SEA_58_Hand_ off_Comms_9_6_ 17_FINAL_(1).pdf

Handout #2

Standardized Handover Process

Charge RN Phone Call

- PED charge RN and PICU charge RN discuss room availability and when the room/bed will be ready for the patient.
- PICU charge RN gives the name and number of the RN taking the patient in the PICU to the PED charge RN.

Readiness Phone Call

- Made by the PED charge RN or the primary PED RN.
- Information exchanged includes name, age, weight, and airway status of patient.
- PED RN to ask: "Is is safe to bring the patient to the PICU?" and "Is the room ready?"
  - This includes suction, bag/valve/mask, and oxygen set up.
- If the room is not yet ready, a futher communication plan must be made.

Upon Arrival

- When possible, a secondary PICU RN will be present to settle the patient and address immediate needs.
- Transfer patient to the PICU bed, place patient on PICU monitor/ventilator, and check the ventilator settings/airway.

Report

- PICU primary RN states when ready for report and all activity ceases during report.
- Report is given in the SBAR format.
- PICU RN asks any remaining questions, the rate and does of drips/infusions are verified with PICU and PED RNs, and ED RN leaves ascom number for PICU RN.

Emergency Department Handoff

Who: ED nurse, PICU nurse(s), ED attending (if appropriate), PICU intensivist (if appropriate), PICU fellow/APP/resident

Before Arrival

- ED Charge and PICU Charge discuss room availability and when the room/bed will be ready for patient
- PICU Charge gives the name and number of the RN taking the patient to the ED Charge

Initial Phone Call

**Will either come from ED Charge RN or RN caring for the patient in ED

PICU RN obtains the following information:

- Name
- Age
- Weight
- Airway status (intubated yes/no, trach, oxygen needs)

COMMUNICATION:

- Is it safe to bring the patient to the PICU?
- Is the room ready?
  - Suction set up
  - Bag/mask set up
  - Oxygen ready

Upon Arrival

PARK AND BRAKE ED stretcher

Transfer patient to PICU bed

MONITOR:

- Connect patient to PICU monitor
- NT or secondary RN obtains blood pressure

VENTILATOR:

- PICU Intensivist/fellow/APP/resident to check initial vent settings
- Connect patient to PICU ventilator
- RT or RN check for bilateral breath sound

Report

BEDSIDE RN STATES WHEN READY FOR REPORT AND ALL ACTIVITY CEASES DURING REPORT

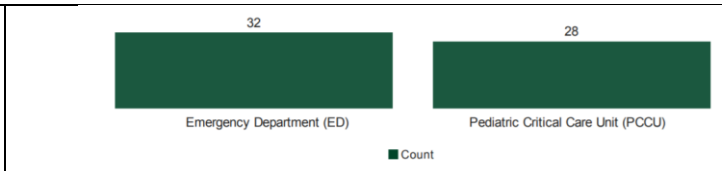
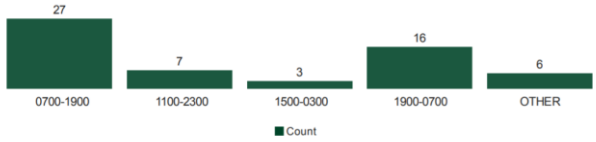
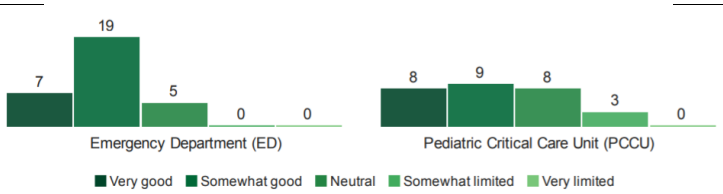
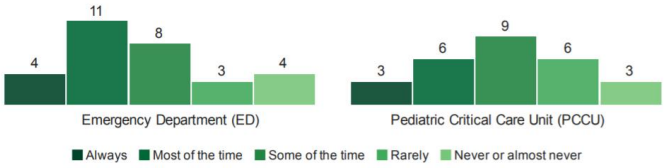
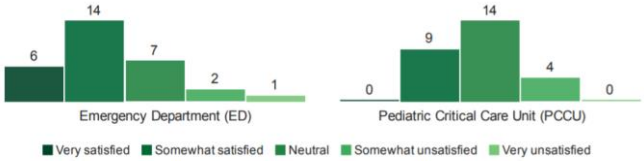
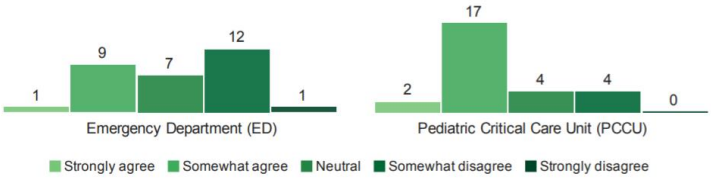
ED RN gives report using SBAR Format: (offer option of logging in to computer)

- **S**ituation: Why is the patient here?
- **B**ackground: Significant medical history
- **A**ssessment: What interventions did they do in ED and how did the patient respond to those interventions?
  - Last time of sedation, pain meds or paralytics
  - Fluid bolus amounts and time(s)
  - Drips/infusions that are currently running
- **R**ecommendation: Plan for the patient and any outstanding orders that didn't get completed by ED RN.

PICU RN asks any remaining questions
ED RN leaves Ascom number for PICU RN

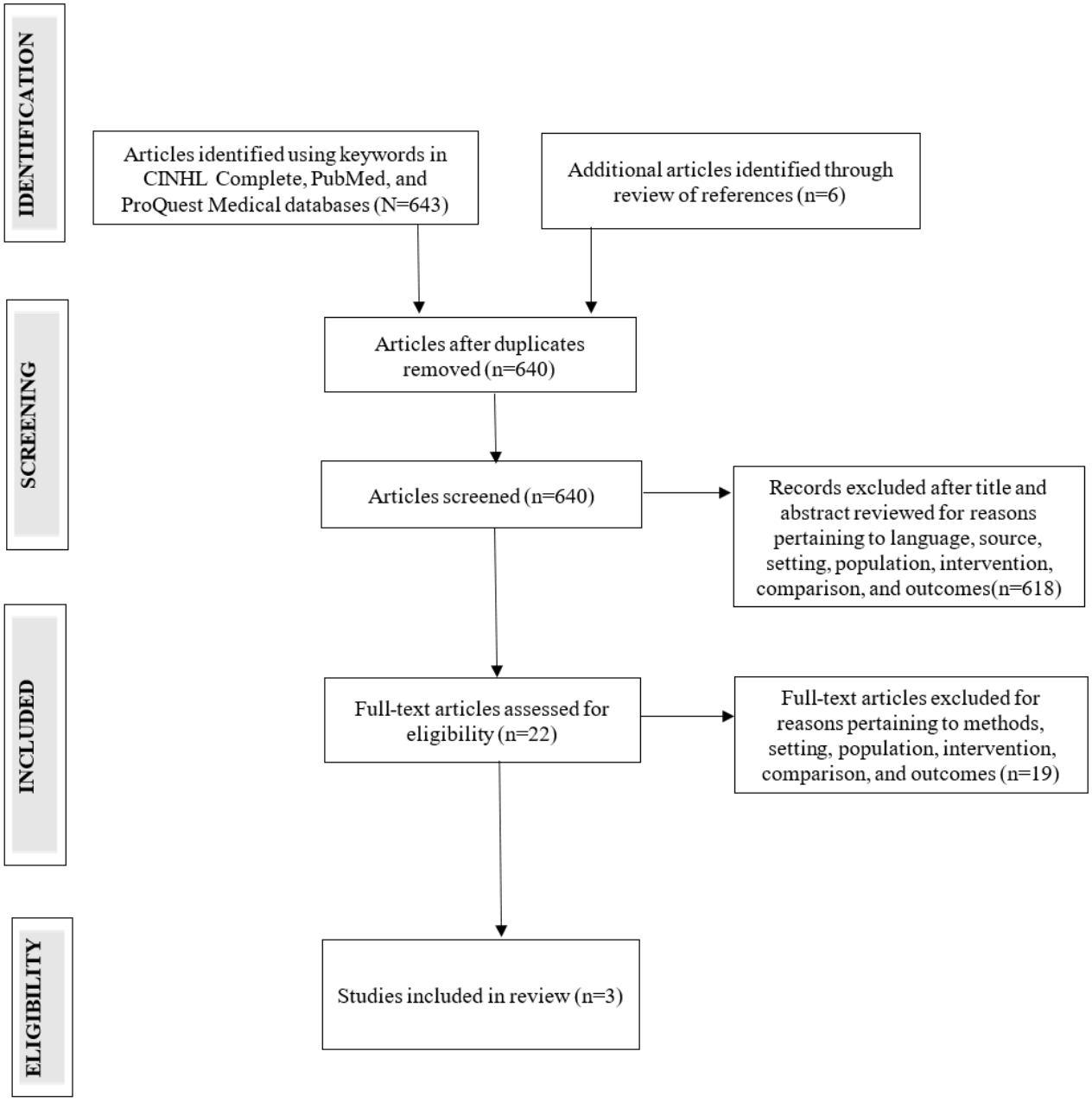
Handout #4

Organizational Assessment Survey Questions with Results

Department demographic data in response to the question, in which department do you work?	
Shift demographic data in response to the question, which shift do you most frequently work?	
Knowledge data in response to the question, how do you rank your knowledge of the content and use of the standardized transition process from the ED to PICU?	
Use data in response to the question, how often do you use the Standard Work or Flowsheet when patients are transferred from the ED to the PICU?	
Information exchange data in response to the question, how satisfied are you with the information exchanged during report?	
Information loss data in response to the statement, information “falls between the cracks” when patients are transferred from the ED to the PICU?	
Satisfaction data in response to the question, how satisfied are you with the implementation of a standardized transition process from the ED to the PICU?	
Are barriers present for safe and/or efficient transitions from the ED to the PICU? If so, what are they?	*answers vary

Handout #5

PRISMA Flow Diagram of Systematic Search



Adapted from "Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement," by D. Moher, A. Liberati, J. Tetzlaff, D. Altman, and PRISMA Group. Copyright 2009 by *PLoS Medicine*.

Handout #6

Table of Evidence

Author	Design	Results	Conclusion
Bergs (2018) evaluated a structured handover process and educational intervention aimed at emergency and intensive care unit(ICU)/ ward nurses.	Quasiexperimental nonequivalent control group pre/posttest study (1 Belgian general hospital)	Post-intervention: The significant change that occurred was an increase in the emergency department nurses' evaluation of interaction/support ($p=0.04$).	Intervention facilitated increased understanding and positive attitudes towards the handover process.
Bigham (2014) evaluated the effect of a multihospital attempt to decrease care failures related to handovers.	Quasiexperimental, nonequivalent control group pre/posttest study (43 children's hospitals, N=7,864 handovers)	69% reduction in care failures from baseline to final assessment ($p<0.05$); All three process measures improved; Compliance improved from 87% to 94% ($p<0.05$); Staff satisfaction increased from 55% to 70% ($p<0.05$).	Improvements were attained across multiple hospitals without decreasing staff satisfaction. High performing hospitals included provided a cognitive aid for staff members.
Lautz (2018) evaluated if the use of ABC-SBAR, a handover tool, would improve information transmission during simulated pediatric emergencies.	Prospective, randomized, pre/posttest study (Urban, quaternary academic children's hospital, intervention, N=20)	There was a posttest difference between the control and intervention group ($p<0.01$).	Standardized handover, in addition to training and a cognitive aid, may increase inclusion of essential patient information during the handover of a critically ill pediatric patient.

Handout #7

PED Cognitive Aid

Revised 8.23.2018

Time of Admission Order: _____

Inpatient Room Number: _____ **Please place patient sticker here**

Admission/Transfer Checklist

The checklist should be completed by the RN and affirmed by the physician. This is expected to be done at the time of the PEWS scoring and prior to any patient being transported to an in-patient unit or another facility.

1.	Are all labs collected?	YES	NO	N/A
2.	Are all medications administered/started?	YES	NO	N/A
3.	Are all procedures completed?	YES	NO	N/A
4.	Are VS done and reviewed?	YES	NO	N/A
5.	Has PEWS been documented?	YES	NO	N/A
6.	Are all consults done?	YES	NO	N/A
7.	Have all concerns been addressed?	YES	NO	N/A
8.	Has RT been notified of admission?	YES	NO	N/A
9.	(PICU only) Charge Nurse phone call complete?	YES	NO	N/A
10.	(PICU only) Readiness phone call complete?	YES	NO	N/A

2

****All above questions should be marked "YES." All questions marked "NO" need to be explained and who was notified must be documented.**

BARRIERS GETTING PATIENT TO FLOOR IN <43 MINUTES-CHECK ALL THAT APPLY AND EXPLAIN BELOW:

- ED RN Unavailable
- Med/Pharmacy
- ED Procedure
- Lab
- Room Dirty
- Floor RN Unavailable w/in 10 min
- Social Issues
- Charge RN unavailable after 10 min
- Patient Placement Delay
  - Bed Changed
  - Waiting for Crib/Bed
  - Bed assignment >15 min
- Sedation
- Radiology Procedure
- Admitting Team Delay
- Patient's Condition
- IV
  - Difficult Start
  - Done by Other Dept
  - Ordered by Inpt

COMMENTS/EXPLANATIONS:

3

RN NAME: _____

PHYSICIAN NAME: _____

WHEN DID PATIENT LEAVE ED?

DATE: _____ TIME: _____

****PLEASE BE SURE DISPOSITION DOCUMENTATION TIME MATCHES THE TIME ABOVE***

ED TO FLOOR HANDOVER

CONSIDERATIONS:

- Interpreter/safety attendant need
- Crib for 2-3 yo (If bed, inform family someone will need to stay with their child at all times)
- 9th floor considerations: Cough, runny nose, or fever in the last 24 hours? Positive strep/respiratory viral panel? Has the patient had an LP? Does the patient have Cystic Fibrosis?
  - If YES to any of these questions, contact the transfer center (#13100)

Patient name, DOB, weight, allergies

CHIEF COMPLAINT/HISTORY

NEURO	**SKIN**
PAIN	**IV ACCESS/MEDS**
CARDIOVASCULAR	**VITALS(PEWS)/PROCEDURES/LABS/SEPSIS SCREEN**
RESPIRATORY - Airway issues (trach, NPA, O_2) - CPAP/BIPAP/Hiflow O_2/continuous albuterol must go to 7CH or 8CH	**PSYCHOSOCIAL/FAMILY CONCERNS** - Who is here? - CPS/MSW involvement
GI/GU	**PLAN**

*see *Intra-Hospital Transport of Pediatric Patient* policy (#11078)

ED TO PICU TRANSFER FLOW/HANDOVER

CHARGE NURSE (CN) PHONE CALL

ED CN and PICU CN discuss room availability and when the room/bed will be ready for the patient	PICU CN gives ED CN the name and number of the RN taking the patient

READINESS PHONE CALL

****Made by the ED CN or the primary ED RN caring for the patient; includes transfers from BW ED Trauma Bay*

Information exchange to PICU RN: ▪ Name: _____ ▪ Age: _____ ▪ Weight: _____ ▪ Airway status: (intubated, trach, oxygen need, NG/OG) _____	Patient safety communication: ▪ Is it safe to bring the patient to the PICU? ▪ Is the room ready? ○ Suction, bag/mask, and oxygen set up ▪ If not yet safe to bring patient, make plan for further communication

UPON ARRIVAL

****When possible, secondary PICU RN will be present to settle patient and address immediate patient needs*

- Patient transferred to PICU bed, patient placed on PICU monitor and ventilator, ventilator settings and breath sounds verified

REPORT

****PICU primary RN states when ready for report and all activity ceases during report*

- **Situation:** Why is the patient here
- **Background:** Significant medical history
- **Assessment:**
  - Interventions/response
  - Last time of sedation, pain medications, or paralytics
  - Fluid bolus amounts and time(s)
  - Drips/infusions currently running
- **Recommendation:** Plan for patient/any outstanding ED orders
- PICU RN asks any remaining questions
- Verify rate and dose of drips/infusions with PICU RN
- Leave ascom number for PICU RN

1

Handout #8

Education

ED to PICU Handover update

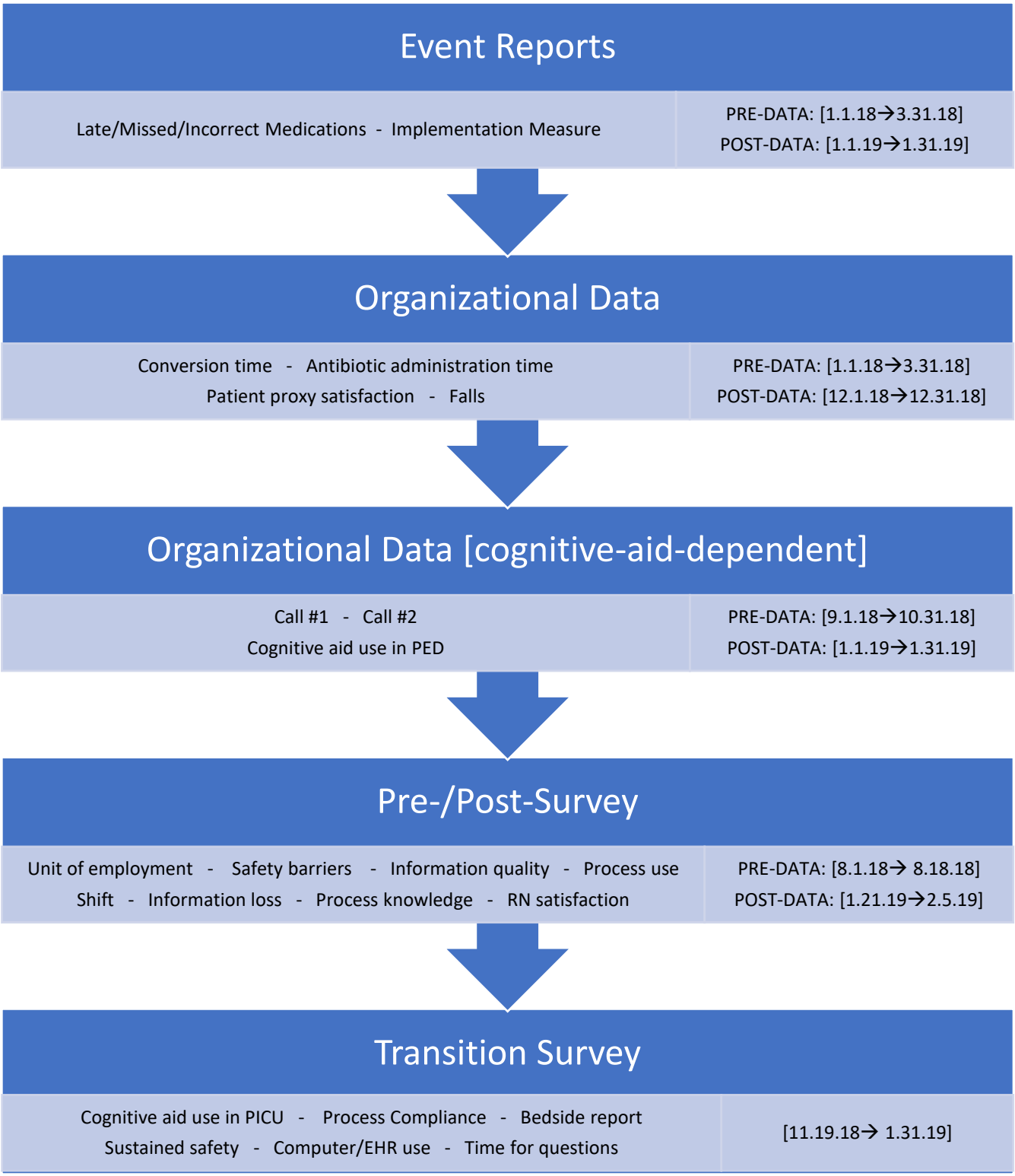
Did you know our pink Admission/Transfer Checklist sheets are being reviewed for patients transferred to the PICU to help evaluate the ED to PICU Handover process and tool? We have noticed that often the following PICU questions do not have an answer.

9. (PICU only) Charge Nurse phone call complete?	YES	NO	N/A
10. (PICU only) Readiness phone call complete?	YES	NO	N/A

Please remember to answer! Although the goal is "YES" based on our current process, we recognize there are often barriers. Please select "NO" when it reflects what took place and provide comments to help us understand how to make the process better. As Kate Shanklin reviews the pink sheets, you may receive a candy reward if your questions are completely filled out ☺ Thank you for your support of this process! Please let Rachel or Amanda know if you have any questions or concerns.

Handout #9

Evaluation Methods



Handout #10

Pre-/Post-Survey

I work in the: (select one)

- ED
- PICU

What shift do you most frequently work?

- 0700-1900
- 1100-2300
- 1500-0300
- 1900-0700
- OTHER

How would you classify your knowledge concerning the standardized transition process from the ED to the PICU?

- Very good
- Somewhat good
- Neutral
- Somewhat limited
- Very limited

How often do you use the Standard Work/"pink sheet" (ED) or Flow Sheet(PICU) when patients are transferred from the ED to the PICU?

- Always
- Most of the time
- Some of the time
- Rarely
- Never or almost never

How satisfied are you with the information exchanged during report?

- Very satisfied
- Somewhat satisfied
- Neutral
- Somewhat unsatisfied
- Very unsatisfied

Information "falls between the cracks" when patients are transferred from the ED to the PICU.

- Strongly agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Strongly disagree

How satisfied are you with the implementation of a standardized transition process from the ED to the PICU?

- Very satisfied
- Somewhat satisfied
- Neutral
- Somewhat unsatisfied
- Very unsatisfied

Are barriers present for safe and/or efficient transitions from the ED to the PCCU? If so, what are they?

_____

_____

Handout #11

Transition Survey

I work in the: (select one)

- ED
- PICU

Admitting diagnosis of patient: _____

Was the standardized transition process **tool** used during the handover?

- Yes
- No

Was the standardized transition process **policy** followed?

- Yes
- No

If no, was there a barrier to the use of ether: _____

Was the electronic health record used during the handoff?

- Yes
- No

Was the ED or PICU staff member logged onto the computer during report?

- ED staff member
- PICU staff member
- Both
- Neither

Was face-to-face communication used during the handoff?

- Yes
- No

Was a time for questions allowed during the handoff?

- Yes
- No

Was patient safety sustained during (and after) handoff?

- Strongly agree
- Somewhat agree
- Neutral
- Somewhat disagree
- Strongly disagree

Did you face any barriers to sustaining patient safety?

_____

_____

Handout #12

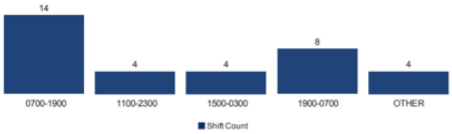
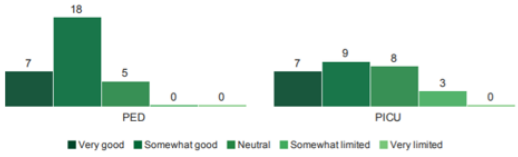
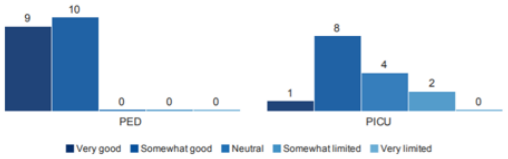
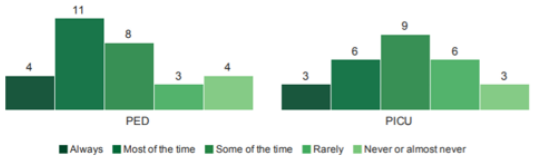
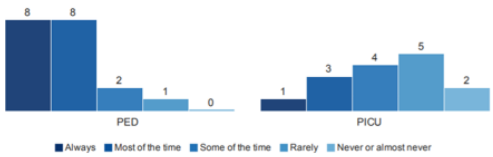
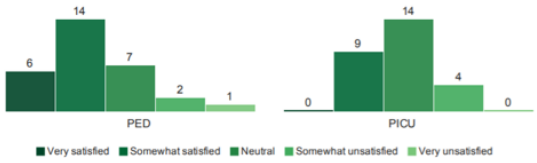
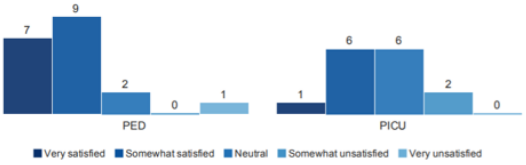
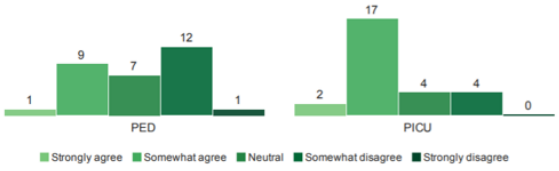
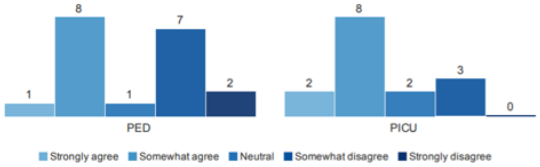
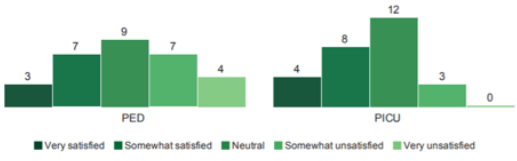
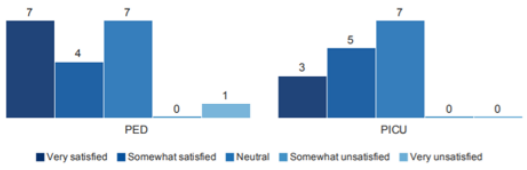
Budget for DNP Project

Doctor of Nursing Practice Project Financial Operating Plan **Improving the Patient Handover from a PED to a PICU** **Using a Cognitive Aid**	
POTENTIAL COST SAVINGS	
Cost mitigation	
ESC submission to The Joint Commission	$ 8,933.50
RN turnover	$ 9,000.00
Prevention of 1 inpatient medication error (median cost)	$ 1,000.00
POTENTIAL COST SAVINGS TOTAL	$ 18,933.50
EXPENSES	
Project Expenses (Including Donated Resources)	
Project Manager Time	$ 3,900.00
Team Member Time:	
Clinical Nurse Specialist (2)	$ 576.00
Registered Nurses (Time Spent Completing Questionnaires)	$ 900.00
Education:	
Charge Nurses (one-time)	$ 127.50
Registered Nurses (two-times)	$ 1,425.00
Consultations:	
Statistician	$ 100.00
Qualtrics online software	$ 1,500.00
Laptop	$ 400.00
Cost of print/copy/fax	$ 5.00
Project Expenses Total (Including Donated Resources)	$ 8,933.50
Donated Resoures	
Project Manager Time	$ (3,900.00)
Statistician	$ (100.00)
Laptop	$ (400.00)
Qualtrics online software	$ (1,500.00)
Donated Resources Total	-5,900.00
TOTAL EXPENSES INCURED BY HOSPITAL	$ 3,033.50

Handout #13

Pre- and Post-Survey Response Comparisons

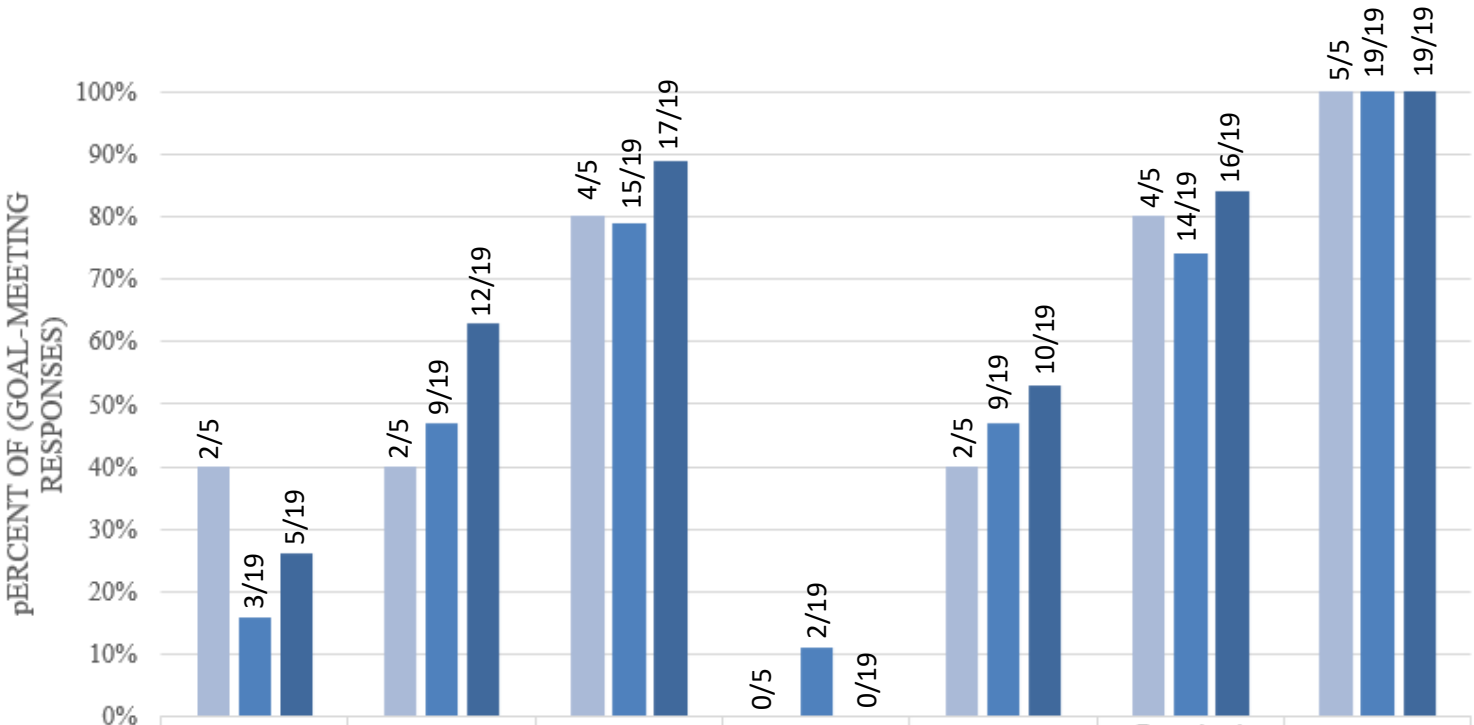
Pre- and Post-Survy Response Comparisons

	Pre-Survey	Post-Survey
Department demographic data in response to the question, in which department do you work?		
Shift demographic data in response to the question, which shift do you most frequently work?		
Knowledge data in response to the question, how do you rank your knowledge of the content and use of the standardized transition process from the ED to PICU?		
Use data in response to the question, how often do you use the Standard Work or Flowsheet when patients are transferred from the ED to the PICU?		
Information exchange data in response to the question, how satisfied are you with the information exchanged during report?		
Information loss data in response to the statement, information "falls between the cracks" when patients are transferred from the ED to the PICU?		
Satisfaction data in response to the question, how satisfied are you with the implementation of a standardized transition process from the ED to the PICU?		
Are barriers present for safe and/or efficient transitions from the ED to the PICU? If so, what are they?	*answers vary	

Handout #14

Transition Survey Results

Admitting Diagnosis of Patient	% (n)
Respiratory Illness	55.8% (24)
Abnormal Labs	16.3% (7)
Sepsis	9.3% (4)
Seizure	7.0% (3)
Trauma	7.0% (3)
Overdose	4.7% (2)



	Tool Used (YES)	Policy Followed (YES)	Bedside Report (YES)	ED Staff on Computer (YES)	EHR Used (YES)	Perceived Safety Maintained (STRONGLY AGREE)	Questions Allowed (YES)
November	40%	40%	80%	0%	40%	80%	100%
December	16%	47%	79%	11%	47%	74%	100%
January	26%	63%	89%	0%	53%	84%	100%

Emergency Department Handoff

Who: ED nurse, PICU nurse(s), ED attending (if appropriate), PICU intensivist (if appropriate), PICU fellow/APP/resident

Before Arrival

- ED ~~Charge~~ **bedside RN** and PICU Charge discuss room availability and when the room/bed will be ready for patient
- PICU Charge gives the name and number of the RN taking the patient to the ED ~~Charge~~ **bedside RN**

Initial Phone Call

**Will either come from ED Charge RN or RN caring for the patient in ED

PICU RN obtains the following information:

- Name
- Age
- Weight
- Airway status (intubated yes/no, trach, oxygen needs)

COMMUNICATION:

- Is it safe to bring the patient to the PICU?
- Is the room ready?
  - Suction set up
  - Bag/mask set up
  - Oxygen ready

Upon Arrival

PARK AND BRAKE ED stretcher

Transfer patient to PICU bed

MONITOR:

- Connect patient to PICU monitor
- NT or secondary RN obtains blood pressure

VENTILATOR:

- PICU Intensivist/fellow/APP/resident to check initial vent settings
- Connect patient to PICU ventilator
- RT or RN check for bilateral breath sound

Report

BEDSIDE RN STATES WHEN READY FOR REPORT AND ALL ACTIVITY CEASES DURING REPORT

ED RN gives report using SBAR Format: (offer option of logging in to computer)

- **S**ituation: Why is the patient here?
- **B**ackground: Significant medical history
- **A**ssessment: What interventions did they do in ED and how did the patient respond to those interventions?
  - Last time of sedation, pain meds or paralytics
  - Fluid bolus amounts and time(s)
  - Drips/infusions that are currently running
- **R**ecommendation: Plan for the patient and any outstanding orders that didn't get completed by ED RN.

PICU RN asks any remaining questions
ED RN leaves Ascom number for PICU RN

Handout #16

Update PED Cognitive Aid

Revised 8.23.2018

Time of Admission Order: _____

Inpatient Room Number: _____ **Please place patient sticker here**

Admission/Transfer Checklist

The checklist should be completed by the RN and affirmed by the physician. This is expected to be done at the time of the PEWS scoring and prior to any patient being transported to an in-patient unit or another facility.

1. Are all labs collected?	YES	NO	N/A
2. Are all medications administered/started?	YES	NO	N/A
3. Are all procedures completed?	YES	NO	N/A
4. Are VS done and reviewed?	YES	NO	N/A
5. Has PEWS been documented?	YES	NO	N/A
6. Are all consults done?	YES	NO	N/A
7. Have all concerns been addressed?	YES	NO	N/A
8. Has RT been notified of admission?	YES	NO	N/A
9. (PICU only) ~~Charge~~ Bedside Nurse phone call complete?	YES	NO	N/A
10. (PICU only) Readiness phone call complete?	YES	NO	N/A

****All above questions should be marked "YES." All questions marked "NO" need to be explained and who was notified must be documented.**

BARRIERS GETTING PATIENT TO FLOOR IN <43 MINUTES-CHECK ALL THAT APPLY AND EXPLAIN BELOW:

- ED RN Unavailable
- Med/Pharmacy
- ED Procedure
- Lab
- Room Dirty
- Floor RN Unavailable w/in 10 min
- Social Issues
- Charge RN unavailable after 10 min
- Patient Placement Delay
  - Bed Changed
  - Waiting for Crib/Bed
  - Bed assignment >15 min
- Sedation
- Radiology Procedure
- Admitting Team Delay
- Patient's Condition
- IV
  - Difficult Start
  - Done by Other Dept
  - Ordered by Inpt

COMMENTS/EXPLANATIONS:

RN NAME: _____

PHYSICIAN NAME: _____

WHEN DID PATIENT LEAVE ED?

DATE: _____ TIME: _____

****PLEASE BE SURE DISPOSITION DOCUMENTATION TIME MATCHES THE TIME ABOVE***