Pediatric Cardiology Patient Transfer

by

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Abstract

Nurses that care for the pediatric cardiology population are in a unique position to be involved in high acuity care over a long period of time. Solid communication techniques are required to ensure the continuity of care for these patients prior to surgery, after surgery, and for a significant period of time after surgeries. This quality improvement project aimed to determine how the implementation of a pediatric cardiology transfer communication tool can improve post transfer outcomes for patients moving from the pediatric intensive care unit (PICU) to intermediate care. Building on a previously utilized database of disease specific tools for disease goals, the pediatric cardiology transfer tool looks to answer if within the pediatric intermediate care nurses, can communication guidelines increase knowledge of care and therefore decrease the number of pediatric rapid responses called on pediatric cardiology patients to thereby improve the likelihood of patients being sent home by the estimated date of discharge. Based on the review of literature on communication tools, an anonymous survey was provided to the intermediate care nurses to identify top concerns for pediatric cardiology care. Analysis of the responses identified the top concerns had by nurses and indicated a need for tracking recent care changes that have been the top causes for pediatric rapid responses and return to PICU. On this basis, it is recommended that communication checklists be utilized for all pediatric cardiology patients when transferred and continues to be utilized up to the anticipated date of discharge for progress tracking. Further research is needed as to identify ways to strengthen the implementation into practice as a norm of pediatric cardiology patient transfer from the PICU to intermediate care.

Key Words: Pediatric cardiology; Transfer Checklist; Communication; Rapid Response; Length of Stay; Intermediate care

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Chapter One: Overview of the Problem of Interest

Patient safety needs are a central focus for healthcare providers and healthcare systems. When reports of decreased patient safety become evident, reviewing the system involved can highlight gaps in practice processes that may be the cause. When the care provided to a population includes more than one healthcare team, a succinct method and process may be a crucial aspect of keeping the patients safe. If the process of patient evaluation and transfer between care teams is lacking, patients suffer complications that result in longer stays and increased hospital costs (to the patient and the facility), adverse surgical outcomes, and even death (Jayaprasad, 2016). Due to the increased number of adverse events and some increased severity, reviewing the system on patient transfer is a crucial starting point for evaluation. It is therefore the goal of this evidence-based practice (EBP) change project to evaluate the cohesiveness of pediatric cardiology care between the Pediatric Intensive Care Unit (PICU) and Children's Intermediate Care Unit (CICU).

Background Information

Congenital heart defects (CHDs) are the most commonly diagnosed birth defects affecting 1%, about 40,000, births a year (Centers for Disease Control and Prevention [CDC], 2018). A study from the CDC (2018) found that one in 77 children in the United States currently has a heart condition. In addition, CHD is the leading cause of birth defect-associated infant deaths (CDC, 2018). Infants with critical CHDs are those that require surgery and other procedures, accounting for nearly 25% (CDC, 2018). Historically, 163,980 pediatric hospitalizations related to CHDs account for over five billion dollars in hospital costs, just over 15.1% of all pediatric hospital costs (CDC, 2018; Simeone et al., 2014). Children with a CHD

are estimated to have the most expensive hospital stays compared to other chronic illnesses, more expensive in cardiac infants (Simeon et al., 2014).

Although the cost of hospital intensive care unit (ICU) stays are not the same across the board, or even the same for every patient, the cost of a day in the intensive care is greater than that of an intermediate care unit (Halpern & Pastores, 2015). The United States has over 400 PICU housing over 4,000 beds (Odetola, Clark, Freed, Bratton, & Davis, 2005). There are two national healthcare databases available for review: Healthcare Cost Report Information System (HCRIS) by Centers for Medicare and Medicaid Services (CMS) and the Hospital Statistics of the American Hospital Association (AHA) (Halpern & Pastores, 2015). Two methodologies of costing can be utilized to further review ICU costs: the Russell equation and national projections (Halpern & Pastores, 2015). Strategies that aim to decrease the number of ICU stays involve multifactorial components of care and should focus on safe high-quality care (Odetola et al., 2005). The concern for gaps in care on transfer for these pediatric cardiology patients calls into concern the increased cost for care and can have significant impact on a state funded facility such as the project site.

As costs continue to rise with the advancement of medicine and cardiothoracic surgical interventions, tracking success and failures can reveal failures in the system. The Society of Thoracic Surgeons (STS; 2015), is committed to public awareness and understanding of cardiothoracic surgical outcomes; thereby, releasing the first publicly accessible reporting system. Congenital heart surgery outcomes can be voluntarily reported to the STS Congenital Heart Surgery Database (CHSD). After being released in January 2015, the data input has increased from 25% to 73.9% (STS, 2017). More than 95% of hospitals in the United States that

perform pediatric heart surgeries submit data (STS, 2017), currently the project facility does not report to this national database.

Following and understanding national data can help improve the continuum of care for this population. Pediatric cardiology patients admitted to the hospital for scheduled surgeries are a select group of patients that move between two high acuity care centers and require a wide spectrum of care. The patients start amidst the high acuity requirements within the PICU post operatively and migrate through recovery and being prepared to transfer out to the CICU. Within the CICU, these patients remain some of the sickest children within the unit and require close monitoring during transition. Mortality rates have increased in a few large hospitals and continued complications have been seen. These increases can prompt national recognition and evaluations.

Description of Problem

The American Academy of Pediatrics (AAP; 2002), created a *Guidelines for Pediatric Cardiology Diagnostic and Treatment Centers* in 1991. The guidelines describe the clinical and physical environments that are needed to care for pediatric heart patients in an accurate and safe manner (AAP, 2002). This too includes the recognition of collaboration between medical and surgical disciplines which reaches the needs of these patients (AAP, 2002). This collaboration within the care is the area that is currently causing the most concerns. At the early start of the proposal, a review of cardiology practices and outcomes was started at the project site (Bonner, 2019). A news article reported an increase in deaths of pediatric cardiology patients, noting that the project site had higher death rates than any of the 82 facilities that report pediatric cardiology outcomes (Bonner, 2019). Some of the concerns included a lacking designation of specific pediatric cardiology nurses and units to care for these patients.

A few years prior, the project site closed its Cardiac Intermediate Care Center (CICC), transferring its eight designated beds specifically for the pediatric cardiology population. This led to nurse turnover and remaining nurses were combined with a second specialized pediatric unit. The unit became a 24-bed unit that was to care for the pediatric intermediate level of care patients. The floor continued to experience pediatric rapid response calls and some noted patient complications.

Significance of Clinical Problem

The proposed identified clinical problem is the readiness of pediatric cardiology patients to transfer out of the PICU to intermediate care. The reason this issue needs review is because of the increase in negative outcomes surrounding the pediatric cardiology population and care team concerns for continuity, even as far as questioning staff capability. With a variety of different cardiac complications, surgeries, and outcomes, there is a need for open lines of communication that encourage positive response to all lines of treatment. This review also stands to encourage improvement for the overall facility. The cardiology department within the facility has undergone a vast change and has segmented this specialty care and the providers.

Looking at continuity of care amongst the pediatric cardiac population opens the door for many opportunities, including designated staff and care areas. In addition, a better understanding of the teams thought process can help better outline specific population needs. This topic was discussed by leading cardiology team members as early as the CICC closure and expansion of local cardiology centers at competing facilities well within the same area.

Question Guiding Inquiry (PICO)

To effectively search and therefore support an EBP, a well-constructed PICO question must be created. PICO is an acronym for patient population, intervention, comparison, and

outcomes. The most relevant and effective information on the proposed topic can be found by

utilizing this format (Melnyk & Fineout-Overholt, 2011). By identifying a clinical problem, the

first step of PICO is completed. The clinical question guiding topic inquiry asks, *"In pediatric*

intermediate care providers, does the implementation of disease-based checklists for transfer

decrease the number of pediatric rapid responses called on pediatric cardiology patients and

decrease the overall length of intensive care days?"

Population. The specific population identified includes the Intermediate Care nurses as

these are the providers that will be in control of checklist use. The attending's (only medical

doctors [MD]) at this facility will also be a key population as these providers are the ones that

continuously review the status of the patient while deciding on appropriate transfer time. In

addition, these providers are encouraged to have continuous communications with the cardiology

team that act as the primary care team and take over all care upon transfer. Understanding the

criteria for transfer can aid families and nurses in preparing for a smooth and safe transition as

well as improve the report that is received from by the CICU nurses.

Intervention. The intervention proposed is to review the process of patient transfer out

of the PICU to the intermediate care unit. A proposal for pediatric cardiology patient checklists

aims to outline patient progress and outcomes by improving the communication had between

nurses during report. If appropriately organized and tailored to meet specific needs of the

environment, a checklist can improve the quality of patient care and the workflow of the

environment (Burian, Clebone, Dismukes, & Ruskin, 2018). There is currently no outline for

patient transfer and no checklist for nurses to follow when caring for the pediatric cardiology

patient, it fell out of practice with the closure of the designated cardiac area. Effectiveness and

usability of the checklist can improve the workflow with the pediatric cardiology population,

improve nursing understanding and readiness of the disease processes and therefore decrease the negative outcomes of the pediatric cardiology population (Burian et al., 2018).

Comparison. There was no comparison group noted for the project site. The Project Manager (PM) reviewed pre and post data as to the number of pediatric rapid responses called on pediatric cardiology patients. In addition, length of stay (LOS) days in the PICU were reviewed pre and post transfer checklist implementation.

Outcomes. The first defined outcome was to decrease the number of rapid responses called for pediatric cardiology patients. By reviewing guidelines for patient transfers, the primary outcome focuses on the making patient transfers a safe process. Currently, pediatric cardiology patients frequently rebound back to the PICU for poor status related to infection, feeding intolerance, narcotic weans, and respiratory compromise.

The second defined outcome was to decrease the overall PICU LOS. A noticeable decrease would indicate improved patient readiness for transfer, improved nursing knowledge on medical expectations, and improved communication with care teams. This would be illustrated by fewer rapid responses once the pediatric cardiac patient was transferred.

A third outcome that relates to sustainability and future project implications was to identify the use of the checklist by nurses. Nurses were not required to fully fill out the checklist for every identified pediatric cardiology patient. However, nurses were encouraged to use the checklist, place it in the patient chart, and keep it for the coming days of the admission. If this is completed, nurses were asked to write a very brief "cardiology checklist utilized," within the free nurses note section. By doing so, the project manager can assess the efficiency and ease of the checklist to support future implications.

Summary

Pediatric cardiology patients undergo a variety of different surgeries as well as a variety of different successes and complications. The patients that are transferred out of the PICU to the children's intermediate care unit require a great deal of education and monitoring. It is the responsibility of the PICU to ensure that patients are appropriately prepared for this transfer and communicate status effectively to the receiving nurse. Without appropriate plans for success and communication that extends to the primary care team and providers, this transfer process can become dangerous to patients while also decreasing the success and knowledge gained for the intensive care and cardiology providers. In an effort to increase knowledge and understanding while also providing safety for patients, identifying practice gaps is crucial. Literary review and statistical data were reviewed in an effort to identify key components that may compromise care provided to pediatric cardiology patients. It is crucial to evaluate to early stages of pediatric cardiology care to delineate options for gap closure and improved patient outcomes and hospital costs.

Chapter Two: Review of the Literature

Congenital heart defects (CHD) is a varied group of diseases characterized by structural defects of the heart (Karsdorp, Everaerd, Kindt, & Mulder, 2007). These malformations are the most common single organ defects diagnosed in live births (Niemitz et al., 2017). There have been significant advances in surgical techniques, medical intervention, cardiac catheterization, cardiopulmonary bypass, and intensive care that have drastically reduced mortality rates allowing for many more patients to reach adolescents and adulthood (Niemitz et al., 2017). With the extensive expansion on cardiac surgeries and care, infants and children are at higher risk for complications and continue to require very high levels of care. To support this quality improvement (QI) project, a comprehensive literature review was completed to determine evidence-based interventions for improving pediatric cardiology outcomes when transferred out of the Pediatric Intensive Care Unit (PICU) along with decreased length of stay (LOS). This chapter details the methodology for this literature review.

Methodology

Sample strategies. A comprehensive electronic literature search was performed using the following databases: PubMed; Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Ovid (including MEDLINE). Keywords used in the evidence search included: pediatric; cardiology; heart disease; checklist; environment; intensive; surgery; intervention; physician; communication; theory; patient; mortality; and outcomes. Keywords were combined using the Boolean Operator "AND". The search initially ran without limits. However, due to the overwhelming return related to surgical interventions and patient studies limits were applied. The limits were applied as five years and English only. To limit the cardiothoracic surgery evidence, limits further included core clinical journals, nursing journals, academic journals, and full text.

Clinical trials and surgical discussions were initially included but proved to be the most significant in relation to medical and surgical interventions, yielding over 100,000 results and therefore were excluded. Literature were deemed more effective when including "checklist" and removed some of the disease specific requirements.

       Evaluation criteria. Literature were chosen for inclusion in the project based on the evidence to support the intervention of cardiology transfer criterion checklists being included in the PICU. Studies were selected based on the criterion of recognizing the impact of medical team communication on patient goals and quality standards as well as promoting streamline communication to improve report given. This provided a support structure that illustrates the significance of the problem of lacking communication, identification of negative outcomes and probable causes, and support of intervention of creating patient centered criterion assessments that better prepare patients and care teams for successful transfers out of the PICU. A literature matrix was used to review the evidence found (see Appendix A).

Literature Review Findings

       Improving communication on patient goals. Creating a more cohesive rounding process with nurses who feel knowledgeable about patient plans and goals can help improve the communication of patients once prepared to transfer out of the PICU. Medical rounds within the PICU can be an extensive process that does not engage all providers (Beck, Albert, Johnsen, Newhouse, & McGuire, 2016). Using real time auditing and survey data collection, researchers aimed to reduce the duration of patient rounding to increase engagement and satisfaction by implementing templates. The templates included care decisions available throughout the day to all providers and included quality and safety questions in the form of checklists which are feasible to transfer to other units and specialties. Results showed significant improvement in

rounding time, focus of rounds and thus care quality in the PICU (Beck et al., 2016). The project

was limited as it had a project manager available for consistent monitoring. This project manager

specifically focused on this implementation process as a unit educator. This specialty position

may be difficult to replicate in other locations and may be changed if more than one person was

used.

Vergales et al. (2015) developed and reviewed the outcomes of a primarily face-to-face

handoff process for patients moving out of the operating room (OR) to the PICU. The primary

goal of the system was to create formal process steps that surround the essential providers across

multiple disciplines to improve accuracy, efficiency, and communication. A checklist was used

to drive handoffs for all pediatric cardiothoracic patients in the six-month pilot window. Pre and

post pilot surveys were completed to evaluate the opinion of the process by physicians, nurses,

and respiratory therapists. Findings illustrated that 94% of participants felt there was an

improvement of care due to open communication and an ease of access to records once the

checklist was implemented (Vergales et al., 2015). The limitation to this survey included the

response rate to post surveys.

Effective use of checklists. Zavalkoff, Razack, Lavoie, and Dancea (2011), conducted a

two-phase prospective study in a 12-bed PICU evaluating the handoff process of pediatric

cardiology patients. All handoffs of post cardiac surgery patients that required cardiopulmonary

bypass and admission to the PICU were included in the study. A one-page fill-in-the-blank

handoff tool was used to guide healthcare providers (HCPs) in the transfer process. The primary

objective for this study was to create an error-proof medical handoff to ensure patient safety and

continuity of care. Findings supported the effectiveness of transfer checklists and the

effectiveness in decreasing high-risk events (HRE) postoperatively, while also not becoming

tedious and more time consuming when transferring patients (Zavalkoff et al., 2011). The strength of the study included the variety of different cardiac disease populations assessed. Limitations included the observation rate having only 31 total handoffs observed (15 before and 16 post intervention), limited research data on handoff and HRE correlation, and the Hawthorne effect with observers and active healthcare providers in the setting (Zavalkoff et al., 2011).

Boydston (2018), created an implementation project that allowed for clinical nurses and families to participate in multidisciplinary rounds (MDR) using the Complex Care Checklist (CCC). The aim was to increase support of such participation and support collaboration to improve patient outcomes of pediatric cardiology patients by means of rounding involvement and checklist use. Direct observations, the Joanna Briggs Institute Practical Application of Clinical Evidence System (JBI PACES) and Getting Research into Practice (GRiP) tools were used. There was a noted increase in empowerment for nursing questioning the status and needs of the patient in MDR but there was not a significant compliance increase in checklist uses (Boydston, 2018). The study did not discuss any significant patient outcomes. This project was limited by its timeframe (six weeks), for both collection and improvement monitoring. However, it was beneficial to see that the checklist was beneficial to the pediatric cardiology population specifically.

Brunsveld-Reinders, Arbous, Kuiper, and de Jonge (2015) recognized the complications related to transferring critically ill patients from the Intensive Care Unit (ICU) to lower acuity levels of care, resulting in nearly 70% of adverse events. The study conducted aimed to develop a checklist to increase safety of these transfers by utilizing a three-step approach to the checklist. Feasibility of using collected checklists were testing by assessing the patient status pre and post transport as the researchers attempted to develop a process that allows for continuity of care that

improves overall patient safety. Nearly 5,937 incidents were reviewed over a 36-month period (Brunsveld-Reinders et al., 2015). Although the study thoroughly discusses the creation of the checklist and its implementation effectiveness, limitations of this study included not discussing the analysis process for replication.

Using a longitudinal pre-post interventional study, researchers conducted data collection to create a nurse-driven rounding checklist (Ganesan, Rajakumar, Fogg, Silvestri, & Kane, 2017). Findings showed a significant increase in nurse presence and participation in rounding with an increased confidence in understanding care plans; this remained stable five years after implementation. The study was successful as it aimed to not only support literary findings on the success of metric-specific checklists on patient clinical outcomes but also in displaying long term sustainability of such tools (Ganesan et al., 2017). The most significant limitation to this study was that it did not evaluate the benefit towards stated goals of care and specific patient outcomes.

Limitations of Literature Review Process

There was a significant portion about the psychosocial and developmental components of a child with CHD and comorbidities that a child may suffer. This was considered a limitation because it focused more on school development and social interaction as child progress. This did not offer any significant support on the current in hospital intervention. Additionally, the transfer out of the PICU was the proposed intervention; however, search results often populated "transition" from neonatal to pediatric and pediatric to adult care, not transition of hospital care units, other than post surgical. This clouded a significant amount of the research and was not deemed beneficial to the defined clinical question.

Discussion

Conclusion of findings. It is evident in the literature that pediatric cardiology care is a medical specialty that can require a multidisciplinary approach to successful care. The American Academy of Pediatrics (AAP) and the American College of Cardiology (ACC) have aimed to provide legislation that ensures infant screening of CHD, illustrating the impact of lifelong care for these children (Lantin-Hermoso et al., 2017). Upon reviewing the literature, it became evident that care can be compromised due to a variety of factors. Poor communication and poor delineation of patient goals can be two factors that derail success for patient progression once diagnosed with a CHD that requires surgical intervention. By implementing checklists for readiness to step care from intensive to intermediate, healthcare providers can visualize and agree upon the progress of care for the pediatric cardiology patient. A HealthLeaders Media Industry Survey found that nearly 88.8% of leaders in quality prevent errors in operating rooms by following checklists (American Hospital Association [AHA], 2013). Developing a well-structured and easy to access checklist as to how pediatric cardiology patients are progressing, nurses can improve communication and feel more confident in understanding patient needs. This can help decrease the adverse events that can stem from errors or missed information in patient transfers; thus, improving the quality and safety of the care provided to the pediatric cardiology population.

Advantages and disadvantages of findings. Advantages of the literature review support the need for improved communication via checklist that focuses on plan of care goals. Nurses who care for patients with a clear understanding of outcomes and goals can provide more cohesive care through a patient's prolonged medical stay. This allows for better understanding of patient history, medical goals and progression, and improved report when patients move from one level of care to another. By implementing a transfer checklist for pediatric cardiology

patients, based on the literature of checklist use, improved understandings of patient progress and goals can help increase patient safety, quality of care and thereby decrease adverse events related to medical care.

Disadvantages of the literature review was that the evidence directly related to pediatric cardiology focuses primarily on improved report from the OR to the PICU. The AHA (2013), reports that checklists can aid the medical field in a variety of areas including decreasing HRE's, injuries and preventable readmissions. In addition, checklists implemented as a formal process can reduce errors due to lack of inconsistency and thereby improve patient transfers (AHA, 2013). While data is lacking as to specific processes for this patient transfer, the literature supports electronic forms of patient goal checklists that can be potentially successful for certain patient populations that are common for specific care areas.

Utilization of findings in practice. Implementation of a pediatric cardiology patient transfer checklist has the potential to decrease rapid response call rates and PICU LOS. Checklists may have a significant positive impact on patient outcomes as a means of detailing steps for discharge preparation in the pediatric cardiology population (AHA, 2013). Without checklists for patient progress discussions, medical doctors may feel a patient is appropriate for transfer to intermediate level of care for improvement, but nurses may be unaware of patient progress and goals. This lack of knowledge can result in pediatric rapid response calls and return to PICU. The development of pediatric cardiology checklists for transfer can improve the readiness for patient transfer, increases nurse's knowledge of patient progress, improve transfer report and increase quality of care and patient success when transferred out of the PICU.

Summary

In conclusion to the literature appraisal, it is evident that there are significant advances to support the pediatric cardiology population. Additionally, there are increased findings as to the communication importance for care teams in the intensive care settings to ensure multidisciplinary involvement and understanding. There are limited findings as to the need for specific guidelines for patient transfer due to the rapid changes felt within the PICU environment, but it is evident that continuity of care through improved communication is a common theme. Given the complications that can arise in this vulnerable population, it is evident that promotion of structured and streamline communication, such as a checklist, can help support this population through the process of diagnosis, surgical intervention, and post-operative recovery. This structure can help guide care teams in following and understanding expectations for medical stability and recovery no matter the unit of care.

Chapter Three: Theory and Concept Model for Evidence-based Practice

The use of theoretical frameworks has become a staple in the health field. Specifically, nursing theory has become a rigorous practice to generate nursing knowledge that can be dispersed throughout the profession (Colley, 2003). In recognizing these specific outlines for nurses, the profession is given an identity and allows for nurses to have a succinct and yet profound contribution to the healthcare needs of providers and patients (Colley, 2003). This chapter includes a discussion of the theoretical model used to navigate the implementation and assessment for the pediatric cardiology population. The use of theoretical and concept models supported by evidence-based practice (EBP) supports the suggestions and evaluations made by the project manager. The discussion of both is critical as the project spans through health care teams that include both medical doctors and nurses.

Concept Analysis

The defined project focuses on a process that can improve the quality of care provided to pediatric cardiology patients. While the project focuses on a specific population, it aims to improve the overall pull through of these patients as the care maneuvers from one unit to the other. In order to promote this pull through improvement, the concepts researched for the project focused on a specific intervention which can affect many different care groups for the pediatric cardiology patient. The key concepts included: checklists, nursing plan of care templates, communication (with medical doctors and nurses), and follow up, and safety improvement. By implementing a process that improves understanding of plan of care and goals, communication improves. With improved communication the patients can more successful transfer from one level of care to the other and thus have more safe and effective progression through the disease process.

Theoretical Framework

The Twenty-One Nursing Problems Theory (see Appendix B) was developed by Faye Glenn Abdellah. Using interrelated concepts of health, nursing problems, and problem solving, the theory focuses on individual patient needs from nurses. The theory proposes a process of 10 steps in which the nurse can identify patient problems (Alligood, 2017). In order to effectively perform these tasks and develop a treatment typology, Abdellah notes that the process takes 11 nursing skills.

The problems found by the Twenty-One Nursing Problems Theory are divided into three categories: physical, sociological, and emotional (Halterman et al., 1998). The needs defined for the patient are divided into four categories: basic to all patients, care requirements, remedial needs, and restorative needs (Halterman et al., 1998). Basic needs are those that require a patient to maintain appropriate hygiene and comfort while sustaining from bodily harm and infection. The ability to facilitate and maintain sufficient oxygenation, nutritional status and regulatory systems, and electrolytes while also sustaining sensory function and regulatory mechanisms are necessary. Remedial are those that show a patient's ability to identify and even accept positive and negatives feelings, reactions, and expressions. This care facilitates goal achievement, self-awareness and the ability to maintain therapeutic environments. The last category is restorative and displays the optimum goals while continuing to recognize and maneuver through new limitations, physical and mental. Patients are noted to have each of the components while undergoing a disease process or treatment plan. According to the Twenty-One Nursing Problems model, these components require the human impact of nursing and requires this review of systems to promote optimal patient health and outcomes (Abdellah, Beland, Martin, & Matheney, 1960).

Application to practice change. The Twenty-One Problems theory can be applied to the nursing assessment process as it transcends through the care of a chronically ill patient (Abdellah et al., 1960). In the project intervention, the goal was to create a checklist that allows participants in care affectively recognize progression in care and goals to be worked towards. Understanding the commonalities and differences for the pediatric cardiology patient allows medical doctors and nurses to effectively discuss the daily and long-term goals that need to be obtained for a patient to safely transfer to lower levels of care and home. Abdellahs' theory requires the nurse to learn about the patient, pull out relevant and significant data, generalize about the data in relation to pediatric cardiology patients with similar data and create a therapeutic plan (Abdellah et al., 1960). This process is a replica of the process required to create and implement a transfer checklist for the pediatric cardiology patient for nurses in the intermediate care setting to take report. The medical doctors within the Pediatric Intensive Care Unit (PICU) are required to round on and discuss the patient, identify pertinent data that can aid or deter the patient from successful progression, identify key components that may flag the patient as high risk for complications (and delayed transfer), and outline a plan for patient progression, all to be reported during nurse handoff.

The theory continues to move through the 10 steps (see Appendix B) which require continued observation and evaluations, family and nursing reaction to patient progress and response to plan, and openly communicating about patient progress and changes that may need to be made (Halterman et al., 1998). This is the process of moving a patient closer to transfer. When these final stages are not implemented, the patient is ineffectively moved from the PICU to the intermediate care unit. The nurses who receive the patient are then concerned about progress of patient and communication of patient goals and progress. This scenario may set the

patient up for poor progression and adverse events that may result in pediatric rapid response calls, return to PICU, and extend patient length of stay (LOS).

Evidence Based Practice Change Theory

Evidence-based practice (EBP) results from the integration of research, clinical expertise and patient input/preference to promote effective decision making and individualized care (McKibbon, 1998). The most universal definition of EBP is, "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research," (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996, p.71). Programs that utilize EBP can reformat care delivery methods that increase the effectiveness of interventions and improve cost and safety outcomes. Although each EBP model may vary in the details, the creation of most current EBP models share a few based phases:

- Ask: Identify clinical problem;

- Attain: Review literature;

- Appraise: Critically appraise the evidence;

- Apply: Evaluate the need for practice change/implementation;

- Assess: Evaluate outcomes. (Hopp & Rittenmeyer, 2012)

The Promoting Action on Research Implementation in Health Services (PARiHS) framework was created in 1998 and has since been revised into the integrated PARiHS (i-PARiHS) framework as it refers to evidence-based change as a means of practice innovation and looks to explain and/or predict success of implementation (Harvey & Kitson, 2016). This particular EBP theory notes that the successful implementation of change depends on the evidence available, the care setting, and the facilitation of the implementation. Each of these

elements includes content that can help illustrate a path of success or failure. The i-PARiHS

emphasizes the importance of perspective from all recipients involved in the intended change

process. This is important as i-PARiHS aims to have facilitators work within a supportive

network that can span across the continuum of healthcare (or the intended environment of

change) (Harvey & Kitson, 2016).

The i-PARiHS provides a way for research to be implemented into practice while

assessing the interaction of three key elements (Kitson, Harvey, & McCormack, 1998). These

elements are evidence, context and facilitation and must function appropriately together to

achieve success. Evidence is the strength of the evidence that is provided and includes four

subsets: research, practitioner expertise and knowledge, intended population, and local

environment (organizational culture). The context is the setting of the implementation and must

include an understanding of the culture, the leaders, and the evaluation process. Facilitation is the

support that individuals may need in order to implement such a process of change. The

framework discusses characteristics that may be beneficial to EBP change but overall requests a

process to help individuals move towards an intended outcome (Kitson et al., 1998).

Application to practice change. The i-PARiHS can successfully aid in the

implementation of a transfer checklist for the pediatric cardiology patient from the PICU to the

intermediate care unit because it effectively supports the main components that are crucial to its

implementation. Evidence indicates that the use of checklists can increase the safety of the care

provided to and improve communication with providers (Burian, Clebone, Dismukes, & Ruskin,

2018). In addition, the project site has a need for change in care provided to the pediatric

cardiology patient. This has been completed thus far by pulling together the literature review

data that supports the checklist process and also by reviewing the data at the project site. The

project site has demonstrated a need for adjustments in the pediatric cardiology patient transfer

process as seen by the rapid response calls in the month of January 2019.

When working with a high acuity area such as the PICU, the creation of a new process

must be direct and well defined as to illustrate the importance, thus recognizing the context. The

process cannot be significantly time consuming or heavy as it may decrease participation in its

use by both medical doctors (MD) and nurses who are providing the care and keeping the

checklists in use. It is important to recognize this need from the context as it also supports data

that was collected in the literature review by keeping time increases to a minimum (Zavalkoff,

Razack, Lavoie, & Dancea, 2011).

This project manager is hands on with the pediatric cardiology patients, therefore review

of transfer resources can be updated in real time with real events. This demonstrates an

environment of support that indicates a desire to make this checklist both effective and feasible.

By operating at the level that the project site requests, utilizing the project site data of adverse

events and conducting real time check in on what is effective and what is ineffective, the

facilitation role of the i-PARiHS was also integrated to the project. This supports the

implementation of a transfer checklist for the pediatric cardiology population within the project

site PICU, a project that follows the EBP framework outline of i-PARiHS not only relevant but

feasible in aiming for success.

Summary

To implement an intervention that improves outcome and care quality for the pediatric

cardiology patient, the project manager must recognize the multiple moving pieces that can

change the process. By using both theoretical and EBP practice models, the project manager is

able to facilitate a change that is needed for the project site, recognized as a need by the project

participants, and support opportunities for adjustments and change. By supporting the patient

needs in recognizing the national data and effectiveness of checklists, the evidence is provided at

a national level while also addressing the personal needs that are seen with the project site. The

process of recognizing a need, understanding the project site, reviewing the PICU teams' needs

and recommendations, and reviewing team dynamics uses the important aspects presented by

both the theoretical and EBP frameworks discussed.

Chapter Four: Pre-implementation Planning

To create a transfer checklist that transcends between two nursing units, it is important to review the concerns and strategies from both units. This collection of data was performed via survey and identified the top concerns with the receiving unit (intermediate care) and was included to improve the transfer checklist. The pre-implementation planning for this project included collection and review of the data to create an outcome that is cohesive, sustainable, and can improve the overall care for the pediatric cardiology patient. The following chapter review discusses the project goals, organizational readiness, and the project evaluation plan including measurable outcomes, evaluation tools and data management and analysis. Additionally, the implementation process will move through staff survey completion and education and the checklist moves into use within the intermediate care unit.

Project Purpose

The purpose of this evidence-based project was to implement a pediatric cardiology transfer checklist, completed during nurse report from Pediatric Intensive Care Unit (PICU) and Children's Intermediate Care Unit (CICU), to assess readiness for transfer of the pediatric patient. The checklist served as a communication tool and was provided to the intermediate care unit (see Appendix D). Assessment of the preparation for transfer was conducted by PICU physicians to evaluate the readiness that must be seen within the setting for a child to be deemed appropriate for transfer. An evaluation of intermediate care nurses was conducted via survey by the project manager to assess the primary concerns nurses have when receiving a pediatric cardiology patient from the PICU setting (see Appendix E). Once a checklist was completed, data was collected after each transfer (estimated to have 1-5 per month) over a 12-week period. Data included evaluating nurses' utilization of checklist and the impact on the number of rapid

response calls and patient length of stay (see Appendix F & Appendix G). The overall goal of

this project was to create an easily accessible and simple transfer checklist that can provide

insight into the care of the pediatric cardiology patient that improves nurse communication and

patient outcomes, while decreasing pediatric rapid response calls and overall length of stay.

Project Management

        Organizational readiness for change. In the initial assessments of the project, it was

identified that the organization was not prepared for change due to internal complications at the

project site. However, after the completion of required adjustments and the resume of

procedures, the project facility has not only been receptive to change but shown increased

interest in supporting a student led project involving the two units. The task required the project

manager to successfully obtain buy in from PICU staff that has recently been experiencing many

changes in care for the cardiac population. This required the project manager to assess and

evaluate seven previous handoff tools and ticker projects and recreate an easy to use transfer

checklist that can remain in use for a significant period and improve the overall standards of

communication and care. Additionally, the tool must serve as communication between the

medical doctors and the nurses. With stakeholder buy-in and the need for immediate change, the

project manager would participate in a newly created Pediatric Cardiac Intensive Care Unit

(PCICU) Project Committee that works to evaluate and change all future cardiology patient

pathways.

        Inter-professional collaboration. The project was led by two major project team

members: the project manager and the PICU Senior Attending. The role of both participants was

to outline the need for the project, review the primary project goal, review data and input from

PICU and Intermediate Care Unit nurses, outline newly established clinical pathways, finalize

the transfer checklist and continue to monitor outcomes and evaluate for sustainability.

Secondary team members included the previous PICU manager and the CICU manager who

assisted with approvals to distribute and collect data from the CICU nurses. Additional team

member who brought knowledge to the project include the research staff nurse and the Pediatric

Rapid Response team intermediate care unit representative.

Risk management assessment. To effectively propose this process to a sensitive

population within the facility, a SWOT (strength, weaknesses, opportunities, and threats)

analysis was completed and presented to the primary stakeholder, the Senior Attending in the

PICU. The analysis helped outline the concerns as the project moved into the implementation

phase and maneuvered through any challenges that may be encountered.

Strengths. The primary strength of this project was the timing and available project

manager. With recent adjustments made with the pediatric cardiology population and team, an

opportunity for an inter-collaborative initiative to address an identified need as a result of the

review. The project manager was actively employed as CICU nurse and had good standing

relationships with the cardiac nurses and physicians within the PICU. With the project managers

established rapport with the staff, the timing and environment was ideal for project discussion,

staff participation, and data collection. Stakeholders input and buy-in to address the identified

need led to a supportive environment for implementation of a standardized checklist to improve

communication among the unit staff and providers. As later discussed, there were no financial

concerns related to the project implementation, which made it an easy pilot project for potential

long-term sustainability.

Weaknesses. A project weakness identified was the timing and transition that PICU was

undergoing, as mentioned, this was a time of review and adjustments to the care team.

Additionally, a new manager was hired into the PICU. The previous manager had played a crucial role in the communication between the two units and provided valuable input in the project design. However, the new PICU manager was in an interim role and had limited input into the project.

Opportunities. Like the weaknesses, the primary opportunity for this project was the timing. It was crucial for the Pediatric Cardiology team to improve the care process for the population and to demonstrate improvement in patient outcomes. As this evolved, and the review process had been completed, the team members were more receptive and available in communicating with the project manager on the project design. Additional concerns from the CICU nurses provided an opportunity for the project manager to address in the project plan. Nurses were concerned with the lack of comfort and knowledge related to caring for a vulnerable population prior to and after the reviews completed by the state. The nurse interest in improving understanding of patient goals led to interest in receiving outlines of project outcomes and being engaged in the evaluation and care process.

Threats. The primary threat to the project was the change in management in PICU. A transition was underway in which staff nurses were adjusting to new management and re-establishing communication and trust after the departure of experience team member/manager. This adjustment and loss in leadership was the primary threat to cross unit support. The project manager collaborated with the Senior Attending, research staff nurse, and CICU manger in communicating project changes and needs.

Organizational approval process. To obtain approval for this project, the initial discussions were started with the PICU and CICU managers. The managers requested a project that could aid in cross unit collaboration in providing care to a high-risk population. The idea of

starting with the transfer process and the PICU physicians' team was taken directly to the Senior

Attending. The idea evolved through the process by collecting pre-implementation data from the

Intermediate Care Unit nurses, PICU nurses, and key members of the Pediatric Cardiology Care

team. The Pediatric Cardiology Care Team included the cardiac nurses in the PICU, heart nurses

in the Cardiac Cath Lab, senior Cardiologist, and rounding Cardiologist in the Intermediate Care

Unit. Feedback from one on one discussion with team members were used to identify the top

four aspects of care to be included on the transfer checklist. Additionally, from this project, a

subcommittee proposal for PICU leaders was generated showing full support in the process.

Each participant in these active discussions proclaimed support for this project with a common

goal to improve the patient outcomes of the Pediatric Cardiology population within the CICU.

After review of the project proposal, an organizational support letter was provided by the

Professional Development Coordinator approving the evidence-based project at the facility (see

Appendix I).

Information technology. Within the collection and pre planning phase no extensive

technology was used. It was a long-term goal to create a checklist that can be used electronically

between the two units to enhance communication. At that point, the checklist would be

embedded into EPIC, the electronic medical record that the facility utilizes. Traditional computer

applications, primarily Microsoft Office and Excel, were used for survey creation and data

collection. A spreadsheet was developed to track the use of the checklist as the patient is

transferred out of the PICU. This allowed for tracking by the project manager via EPIC chart

audits to evaluate utilization of the checklist with transfer as an identifier on the rapid response

call (see Appendix C).

Cost Analysis of Materials Needed for Project

There were minimum costs associated with the implementation of this project. Early survey creation utilizes traditional computer applications. Given the Pediatric Cardiology population is limited, the printing cost was minimal. If the project was deemed successful during the implementation phase, there was potential that the checklist could be embedded into the EPIC charting program. This integration would occur with partnership with the organization information technology services and would have minimal cost. A budget was created that outlines the estimated cost for printing materials for each presentation to the PCICU committee, possible PICU staff meetings and CICU staff meeting. Additional cost included small snack incentives for staff attendance. Total budget estimation was based on the number of nurses on each unit (see Appendix J)

The benefit of the project outweighs the cost proposed for project implementation. As can be seen by analyzing the budget, there was no significant cost in implementing the communication tool. If utilization of the communication tool improves overall length of stay and shows decreased rapid response calls, the benefits far outweigh the minor costs associated with the implementation and evaluation of this project.

Plans for Institutional Review Board Approval

With the project focusing on the physicians and the staff and not the pediatric cardiology patient, the project was submitted for review by organization's Nursing Research Council (NRC) as required. With three draft edits completed, NRC approval was completed, and the project was submitted to NRC approval was received through the project site after three completed drafts were submitted. The survey was then adjusted and completed for the project site IRB review. The project was deemed Quality Improvement (QI); therefore, no formal IRB was required, and the project was approved to continue by exception. With both organizations approvals received

the IRB at East Carolina University (ECU) was addressed. Waiver for the project was again received. All necessary approvals have been completed.

Plan for Project Evaluation

        Demographics. Once the checklist was implemented, data was collected on the Pediatric Cardiology patient transferred out of the PICU using a simple flowsheet as to whether the checklist was utilized (see Appendix C). Patient demographics were recorded by the code system (Appendix K) only when a rapid response is called. Upon discharge from PICU, there was an estimated length of stay established based on the standard clinical pathways available for the diagnosis. This acted as the standard for this given patient. If a rapid response was called, the estimated discharge date was adjusted, and the project manager worked to capture the number of extended inpatient days, which was then reported as an average. This worked as an illustration as to the effects of rapid response calls. Nursing demographics were completed as a basic summation of how many nurses are on the unit, how many completed the initial survey and how many attended the staff meetings or secondary education sessions. As the checklist moved into the hands of the nurses, no physician demographics were collected. Involvement of the physicians included only the involvement of the committee and rounding Cardiologists as adjustments to the checklist were made through the implementation phase.

        Outcome measurements. The first defined outcome was to decrease the number of rapid responses called for pediatric cardiology patients. With an adjustments and reintroduction of the clinical pathway and transfer process being completed by the new clinical committee, it was likely patients would be better prepared for transfer and nurses better prepared for the care needed. At that time, pediatric cardiology patients frequently rebounded back to the PICU for poor status related to infection, feeding intolerance, wean status, and respiratory compromise.

Patients were identified as prepared to transfer based on the clinical pathways that have been created by the PICU Senior Attending and PCICU committee which also address each component on the transfer checklist. These pathways were available but not in use in the facility. It is the yearly goal of the PCICU committee to implement a new series of pathways based on diagnosis. The compilation of these is not yet complete; however, the project manager has been utilizing the previous document as a resource with the staff survey to identify the top concerns of the pediatric cardiology population via the discussed survey (see Appendix E). These pathways and discussions helped guide the transfer checklist that was created and introduced. Rapid response data collection occurred weekly. Once a rapid response was called, the data flowsheet was marked as it influenced the second outcome measurement.

Evaluation tool. Within the project facility, Pediatric Rapid Response committees (PRRC) discuss monthly rapid response calls and evaluate the outcome of the patient and the response from the nurses that were involved in calling the response. This information was available upon request from the representative within the CICU. A chart was utilized to transcribed discussion within the committee to identify rapid response calls as they coincide with the pediatric cardiology population (see Appendix G). Rapid Response information was available from the PRRC documentation and review. Information collected for the project review included the patient, primary diagnosis, reason for rapid response call, and outcome (return to PICU or not) (see Appendix F). This information was collected to identify whether the causative call factor was related to the top concerns identified from the staff survey and on the checklist. If additional information was needed as to the call reason, EPIC chart audits were completed. The information from the PRRC was evaluated on a weekly basis as this is per the PRRC flag process for reaching out to staff.

Data analysis. The analysis of the PRRC data was presented as a frequency and

percentage of the number of pediatric cardiology patients that have a rapid response initiated (see

Appendix G). Rapid response calls were evaluated weekly. Data was tracked and trended on the

number of patients with rapid response calls transferred back to PICU. A second percentage

report was created of the patients with a rapid response that do not return to the PICU.

Second outcome measurement. The second defined outcome was to assess the length of

stay of the pediatric cardiology patient. With new clinical pathways and improved transfer

process, it was more likely that the patients would progress more successfully through the plan of

care. If there was improved understanding of current status and long-term goals of the patients by

identifying early concerns and discussing them via the transfer checklist, it was anticipated that

intermediate care nurses would assist the patient more succinctly as they moved through

recovery, with less setbacks. Anticipated discharge dates were created once the patient

transitioned to the intermediate care unit. If a patient progressed smoothly through the clinical

course, these estimated dates should be like those created on the clinical pathways (from the

PCICU committee based on diagnosis). If the patient had a change in clinical status that

warranted a rapid response call and return to PICU, the project manager would begin to audit the

post rapid response days to monitor the number of days the stay was prolonged related to the

event.

Evaluation tool. The evaluation tool for the length of stay was a combination of the two

tools (see Appendix C) and the PRRC survey tracker (see Appendix F & Appendix G). These

two data sheets included transfer out of the PICU, the reason for the rapid response call, and

whether the patient returned to the PICU. This allowed the project manager to identify the

number of days passed the original planned discharge date. The reason this chart was used pre

and post transfer was because it also helped identify the baseline status of the patient related to

oxygen status, feeds, and weaning. These continued to be contributing factors that could have an

impact on the clinical pathway and overall goals of discharge by diagnosis. The length of stay

continued to rely on the anticipated date that was set by the Pediatric Cardiology team with the

daily rounding.

Data analysis. Data from the length of stay was communicated via two averages. The

first is the average number of days spent in the PICU and the second as an average number of

additional days in the hospital exceeded original anticipated date of discharge. This data was

collected by chart audit on a weekly basis, as the rapid responses are called (see Appendix G).

The new anticipated date of discharge was created by the Pediatric Cardiology team once the

patient was in the intermediate care unit.

Third outcome measurement. The third outcome measurement was to assess the

utilization of the transfer checklist. It is the goal to have the tool utilized at 70% among at least

50% of nurses. With this being a new format for taking report, it was more likely for

intermediate care nurses to obtain a succinct and focused report assessment from the PICU nurse.

In having these key components highlighted and discussed, receiving nurses would have a better

understanding of the patients' current progress and goals to better prepare for receiving care.

Chart audits of checklist use were completed weekly and confirmed if a rapid response was

called (see Appendix G).

Evaluation tool. At the time, there was no current practice on annotating who report was

received from or from what unit. However, there are multiple processes for doing so occurring

throughout the project site, just not in a designated location. Nurses were encouraged to note in

one designated area that report was received from PICU using the transfer checklist so that a

chart audit could provide a percentage for checklist use. This location was to be in a free nurse note. This allowed for a focused chart audit and not an in-depth review. Additionally, it helped support future education on the ease of checklist list and its effect on patient outcomes.

Data analysis. The analysis of the transfer checklist usage data was presented as a frequency and percentage of the number times it was in practice (see Appendix G). Chart audits were conducted weekly. Data was tracked and trended on the number of times the checklist was used at time of report. A second percentage report was created of the patients with a rapid response that did not have a checklist used.

Data management. Data collection from staff was collected via paper survey. Survey data was recorded on an excel spreadsheet for data analysis. No identifying information was recorded. Paper surveys were stored within a locked cabinet in a private locked office. Data recorded for this project were stored on a password protected computer in a locked private office.

When rapid response data was collected from chart review, patients' identifiable factors were transcribed to data collection tool and no patient name was utilized. Patient diagnosis was the identifying factor but was charted using a coded system (see Appendix K). This data remained in the locked storage cabinet within the private locked office. When data collaboration was needed, paper printouts were presented to the project team members that included no identifiable data and were only a summation of the specific occurrence in question, such as a rapid response call. After review, hard copies were discarded in the hospital grade paper shredding areas.

Data was stored until the project was completed and analyzed, a total of five months. At the time of completion, the project manager ensured that there had been no unofficial disclosure of findings and only aggregate data was being presented. All paper components were shredded

and discarded according to facility policy. All electronic components were encrypted and deleted according to university policy.

Summary

The implementation phase of this project required open communication and collaboration between the major team members and the project manager. With the completion of all approvals from project facility NRC and IRB as well as university IRB approvals, implementation can continue to the next steps which began with outlining the concerns of the CICU to the PCICU committee as a formal transfer checklist. Once completed, this data was disseminated to the PICU physicians and available to the CICU nurses. The work with the PICU Senior Attending and rounding cardiology physician continued to aid in data collection and projected changes to the checklist. As the project moved to the implementation phase, focus turned to the completion of surveys and adjustments to checklist release. The project manager also geared focus towards staff education for checklist publication.

Chapter Five: Implementation Process

In implementing a project within a large medical facility, it is important to bring in each of the discussed components from the pre-implementation phase and effectively distribute this information through project implementation. This is especially important when the proposed topic is assessed on one unit but affects a cross unit method of receiving report on a specialized patient population. As the project manager moves into the implementation phase, it is important for early recognition of potential project barriers that could require plan variation in to achieve successful project outcomes. This chapter discusses the details of the project implementation as it moves into the active process phase of the project and monitors for successful project outcomes.

Setting

The setting of the proposed project was a large medical facility that encompasses three pediatric care units and two intensive care units. The project focused on the care of the pediatric cardiology patient who was cared for between the Pediatric Intensive Care Unit (PICU) and the Children's Intermediate Care Unit (CICU). The project included implementation of a cross unit communication tool to be used between the two units' staff. Improvement in rapid response calls and stabilization of length of stay within this unit allows for widespread quality improvement (QI) implementation of a transfer checklist, which can streamline pediatric cardiology patient care within the project facility.

Participants

There are two groups of participants in this process. The first are the nurses within the PICU. These nurses were educated on the process of the checklist (see Appendix D) implementation and usage for the intermediate care nurses. The education focused primarily on preparation for the type of report that the intermediate nurses need to obtain to provide continuity

of care when a pediatric cardiology patient was being transferred. It remains at the discretion of the intermediate care nurses in using the checklist although was strongly encouraged as part of implementation.

The second groups of participants were the bachelors prepared Registered Nurses on the CICU (please note only bachelors prepared nurses are within these units). These nurses participated in three project parts. The first part was the intermediate care nurse survey (see Appendix E) completion prior to the checklist implementation. The second was the process of using the checklist, actively asking the questions as the nurses receive report and charting effectively that the checklist was used for the cardiology patient. The third was in charting the use of the checklist so that it can be tracked by the project manager. There were no exclusions from the process of participant selection.

Medical doctors within the PICU were utilized as a support system as the project manager continued to evaluate the usage of the checklist. As the medical doctors continue to revise the clinical pathways for the pediatric cardiology patient, key areas of concern continued to be discussed. Based on the chart audits within the intermediate care unit, information regarding nurse comfort and knowledge of these clinical pathways was also provided.

Recruitment

All nurses within the PICU CICU were eligible to use and participate in the process surrounding the transfer checklist. Nurses were invited to complete surveys and utilized checklist but were not required to do so. All quality improvement (QI) and research projects are voluntary within the project facility. If positive results were to be found, checklist use may be standardized. Nurses were notified that participation was voluntary; however, the nurses were encouraged to participate given much of the checklist revolved around the input from the intermediate care unit.

Nurses were notified at staff meetings and via email about the project. Staff meeting minute will be made available on the unit for staff review. Nurses were notified that there was no penalty for not participating in the process of using the checklist but were highly encouraged to do so as it would only benefit from nurse input. CICU nurses taking report had primary access to the checklist and may guide report questions based on the outlined assessment items listed on the checklist. Even if an intermediate care nurse was using the checklist, the PICU nurse should not feel any difference in the report given, other than perhaps providing more in-depth patient assessments information as it relates to the patients most recent changes. PICU nurses may or may not be aware if a receiving nurse is using the checklist.

Implementation Process

      Survey distribution. Nurses in CICU were provided a pre-implementation survey to identify key complications as they relate to the cardiology patient (see Appendix D). These surveys were placed in each nurse's mailbox. Nurses were provided a confidentiality statement to keep nurse input anonymous and ask to complete during a period of two weeks. Nurses were also notified that the survey was voluntary only and that there was no penalty for not completing. Instructions were provided to the nurse on after completion of the survey, drop it in the large collection envelope outside the nurses station. The project manager collected the surveys weekly. During a monthly staff meeting and via staff meeting minutes, nurses were updated on the project process and progress.

      Checklist creation and publication. PICU nurses were notified via email of the new transfer checklist. Nurses within the PICU had access to the checklist and was able to look through and prepare it prior to calling the intermediate floor for report. The nurses were not

required to fill it out as it was kept on the intermediate floor and serve more effectively as a

resource for these nurses.

CICU nurses were notified via email and unit posters that the transfer checklist was

available for use. These nurses were shown the checklist via staff meetings and a sample

checklist was available within unit education binders.

Staff education. Nurses on both units were notified of the project process. The project

manager attended two meetings in CICU at which time checklists were reviewed and available to

look over. Meeting minutes were also provided to all staff via email and unit websites. All

materials were also provided to the PICU staff via email and rounding. With this distribution, the

project manager provided the checklist in attachment form for easy access for those nurses

reading the summary after meetings. Two binders were created that included: helpful points,

benefits of the checklist, cardiology tickers (clinical pathways created by the facility providers),

and copies of checklists. Laminated copies of the helpful points were also provided for quick

reference.

Checklist publication. Once surveys and updates were completed, the checklist was

"released." There was one primary binder in the PICU and one in the intermediate care unit that

provided: project information, project goals, and samples of cardiology Tickers, Nursing

Research Council (NRC) and Institutional Review Board (IRB) approvals, and the Pediatric

Cardiology Checklist. The binders also outlined the two checkpoints implemented into the

project (one month in, two months in) with space left for nurses to leave feedback. These

checkpoints would allow the project manager to identify concerns that nurses found in using the

checklist as well as provide time frames for project updates that the staff could expect.

Additionally, the month one check in allowed for full release of all of the education binders as

they provided a one month check in progress report for the nurses to review. This progress report

included use of the project and rapid response calls. These checkpoints were also a time for

collective review of the weekly chart audits and monthly rapid response calls. During these

checkpoints, the project manager also checked in with the PICU Senior Attending and the Senior

Cardiology Attending to identify concerns or changes that could be warranted on the checklist.

Review of rapid response calls was also included in the check in and again discussed with the

PICU and Cardiology Senior Attending's.

Plan Variation

The primary variation from the plans included the addition of the monthly check-in's and

rounding with the cardiologist each week. Only one rounding cardiologist was actively using the

Project Ticker set forth by the Pediatric Cardiology Intensive Care Unit (PCICU) committee.

Therefore, there was a lack of understanding and communication about the tools available with

the nurses as well as the residents. Therefore, a meeting was set with the Cardiology Nurse

Navigator and the Cardiology Senior Attending. This meeting outlined the checklist as it related

to the nurses and the rounding cardiologist, the bedside nurse and the cardiologist. In the second

check in, there was a divide between PCICU staff and this current checklist. Meetings were

conducted to establish how the tools would communicate during and post transfer to effectively

meet the needs of the intermediate care nurses. By adding in the monthly checkpoints, these

discussions provided a time for updates and discussions as to the efficacy of the checklist and the

ease of implementing it into the cardiology population despite different physicians rounding.

Summary

Success in the implementation phase relies heavily on executing an easy to use process

that does not tremendously expand the workload of the nurse or introduces complex steps into

receiving and giving report. For this reason, it will be crucial in the implementation phase to start

off with effective communication and explanation and to follow up with support and adjustments

that again meet these needs for nurses. It is also vital to ensure that the information that is

obtained via transfer checklist remains relevant to the care provided to the patient. This will

allow the nurses to witness the effective outcomes that can be developed from streamline

communication while not hindering care or increasing the workload on the nurses.

Chapter Six: Evaluation of the Practice Change Initiative

Evaluation of the evidence-based practice (EBP) change initiative was done as a continual assessment over a three month period. During this time, checkpoints were marked at the end of each month at which time data was collected, graphed, and reviewed. Changes to the practice change initiative, in the form of meetings, open discussion, education, and checklist revisions were completed based on those monthly findings. At the end of the three month period, a complete analysis was finished to assess the success of the EBP change initiative as it related to the three defined outcomes. Additionally in this section, demographics as to the initial nursing survey are discussed as it is probable that they play a role in the overall findings of the project assessment.

Participant Demographics

The demographics that are discussed for this project surround the nurses that practice in the Children's Intermediate Care Unit (CICU). These nurses were the subject of survey, implementation, and outcome analysis.

Unit demographics. The intermediate care unit was the primary focus for the quality improvement project. This unit is comprised of 24 beds that care for pediatric intermediate and acute care patients. There is no limit as to the number of intermediate care unit patients that can be on the unit at a given time. The intermediate care level is defined as those pediatric patients that require step down level care but it is not limited to cardiology patients. There are two central monitoring stations on the unit and central monitors in each patient care room. When the unit is fully staffed it utilizes eight to nine nurses, two ancillary staff members and a secretary.

Participant demographics. The intermediate care unit is comprised of 58 total nurses. All nurses of the unit were female and only 25.8% (n=15) of nurses have over five years of

experience. The unit took over cardiology patients five years ago; therefore, this is the

percentage of nurses that was most likely to have had experience/exposure to the pediatric

cardiology patient process since integrating into the unit. Only two of the 58 nurses remain on

staff from the original pediatric cardiology unit. The unit has seven nurses that work strictly day

shifts and three nurses that work strictly night shifts. The remaining 89.6% (n=51) of nurses are

split between days and nights. This was important to note as pediatric cardiology patients are

often only transferred during day shifts unless there is an emergency need for room or

adjustments in the Pediatric Intensive Care Unit (PICU).

      Survey demographics. The survey was made available to all nurses on the intermediate

care unit, 58 total nurses. The survey was made available with no requirement to complete due to

the guidelines set forth by the project facility nursing research council (NRC). However, nurses

were made aware that: the surveys would remain anonymous; all responses were welcome; and

that they could be returned to the project manager without shared return rates to the assistant

nurse manager or nurse manager of the unit. Surveys were provided as a hard copy and kept on

the unit for a total of two weeks with easy access return via sealed envelope back to the project

manager. Surveys had six questions and allowed for ranking, "yes/no" response, and open

response. Room for free comments was also provided on the survey. Of the 58 total nurses, ten

surveys (17%) were completed and returned to the project manager.

Intended Outcomes

      There were three defined outcomes set forth for this project. These intended outcomes

included the decrease of pediatric rapid response calls, the decrease of length of stay (LOS) days

within the PICU, and to identify the ability to sustain the checklist long term. These outcomes

are discussed below.

Decrease pediatric rapid response calls. The first outcome was to decrease the number of rapid response calls made for pediatric cardiology patients. This outcome was intended to show that the use of the checklist created a better transfer picture for receiving nurses, which would better allow them to manage and understand any changes in patient status within the first 48 hours of transfer. With pediatric cardiology patients undergoing many changes related to feeding, weaning, and oxygen requirements these were the focus of the transfer checklist. These are the primary causes for rapid responses calls on the pediatric cardiology patient as well as the top noted concerns for receiving nurses. These two reasons supported this being the top outcome measured by the project initiative.

Decrease PICU LOS. The second intended outcome was to decrease the number of days the patient spent in the hospital if the patient returned post rapid response call. With so many readmits back to PICU post rapid response, pediatric cardiology team members have expressed hesitation in transferring the patient back out to the intermediate floor due to this complication in the intended plan of care. Often the increased number of days in the PICU results in longer days on the unit post transfer as it relates to patient healing process as well as required education for discharge. There were two outliers in the numbers collected during the QI project. One patient was kept in the PICU greater than 30 days due to the need from extracorporeal membrane oxygenation (ECMO). The second outlier from the patient values passed while in the PICU post transfer back from the intermediate care unit.

Checklist sustainability. The final outcome was to identify the utilization of the checklist by nurses on the intermediate care unit. This outcome was necessary to illustrate possible sustainability of the checklist as well as reimplementation of the project. The next steps

to this project would require that every pediatric cardiology patient that transfers from the PICU

to the intermediate care unit must have a checklist started upon transfer.

Findings

The findings of the project were found to be less significant than anticipated. The pilot

showed a low rate of survey response and checklist utilization due to the lack of mandated

requirements to participate. However, the low participation numbers and continued negative

patient outcomes showed a substantial need for further work in project sustainability. The

discussion of project findings are below.

Decrease rapid response calls. Over the three month span of project implementation

(March, April, & May 2020), there were six total pediatric rapid response calls on pediatric

cardiology patients. Two of these calls occurred within the first 48 hours after transfer. Each of

these rapid responses was a result of increased work of breathing and requirement of higher

oxygen requirement and fluid management. This number of rapid response calls does not

indicate a significant increase in comparison to March, April, and May 2019 of the previous

year, during which there were five calls made.

The facility has worked to build a culture that supports nurses calling rapid responses

when they feel necessary. For this reason, as the project moves forward through a cycle of

refinement, the new outcome would look to reduce PICU "bounce back." This would still allow

nurses to call the rapid response as needed as a means of a culture of support. However, the

outcome would look to manage the patient safely on the intermediate care unit without sending

the patient back to the PICU while decreasing the number of calls within the first 48 hours post

transfer.

Decrease PICU LOS. From March to May 2020, there were 16 total pediatric cardiology patients admitted and discharged from the intermediate care unit. These patients did not extend more than an average of three days passed their anticipated date of discharge at transfer. Of note, this does not include the two outlier patients that were captured in the above discussion of pediatric rapid response calls. However, this does include the pediatric cardiac catheterization (cath) patients that are brought in from the pediatric cardiac cath unit and listed as observation intermediate patients (discharge within 24 hours). Without these four additional patients included in admission and discharge analysis, the number of stay days was not significantly extended. The average remained about three days for all pediatric cardiology patients. The primary reasons for extended LOS days, included feeding, parent education requirements, and discharge resource management (set up of home care and home supplies). The two outlier patients included one that required ECMO and stayed in the PICU for greater than 30 days and remained after the completion of the project. The second outlier included the pediatric cardiology patient that passed after transferring back to the PICU. These outliers are not included in the LOS values but instead can be tracked by morbidity and mortality captured by the pediatric cardiology providers and PICU.

Checklist sustainability. Of the 16 eligible patients for checklist use, four checklists were effectively used to time of discharge (25%), completed by four different nurses (6.8%). While it is beneficial to see a variety of nurses use the tool, the goal set forth for the QI looked to have 70% of patients have a checklist utilized with at least 50% of nurses attempting to do so.

Original project outcome goals looked to embed the pediatric cardiology checklist into the electronic charting system (EPIC) within the facility. However, it was found that this was not an option at the facility. Findings of rapid responses causes indicate for the need for improved

communication and patient outcome discussion as well as parent and resource management and involvement.

In the final month of the project, sustainability and reimplementation extended to the PICU; therefore, indicated some adjustments for future use. The resources that were introduced to the intermediate care unit, including the door signage, cardiac red folder outside the door that keeps the checklist and a second PICU checklist can be introduced into the entire package that specifically stays with the patient. PICU nurses would utilize a patient checklist for transfer report that more effectively highlights the last 48 hours of patient care and changes. Once transferred, the red folder and signage would remain with the patient until discharge and be part of daily cardiology team rounding so that updates can be followed between the team, nurses and family. This continues work as a symptom tracking system for the team and nurses but will also help identify education and resource needs that can be handled prior to the date of discharge so that they do not hold the patient over their intended LOS.

Summary

The importance of this project was to identify and adjust to the significant concerns that surround the highly acute pediatric cardiology patient. In working through a three month period, the project included the PICU nurses and manager, the intermediate care unit nurses and manager, and the senior attending for both the PICU and pediatric cardiology team. This mass involvement illustrates the high need of communication and streamlined care that these patients require. The outcome findings did not indicate success in management of decreasing rapid response calls and number of intensive care days. However, the project indicates two key points. The two key points are to adjust to initial goal into reducing PICU "bounce back" and to implement the transfer checklist as a mandate for all pediatric cardiology patients moving from

the PICU to the intermediate care unit. While the outcomes did not indicate the anticipated

success of the project, it does further support the literature review and discussion as to the needs

of the project and long term sustainability efforts.

Chapter Seven: Implications for Nursing Practice

Moving beyond the implementation for a widespread quality improvement (QI) project causes review and discussion for future implications that may result from the process. The recommendations for future development will surround the ability for the project to meet the demands of a growing facility. In order to do so, the project manager will discuss the aspects of development as related to essentials of practice. These essentials encompass the ability for the project to become sustainable through a multi team member approach to improved communication. These essentials are therefore the guide to discussing practice implications. Each essential will be supported by one recommendation of either sustainability or advancement.

Practice Implications

Practice implications are consequences implied when a plan is put into a real-life practice scenario or setting. These implications do not have to be negative but instead are implied results. The American Association of Colleges of Nursing (AACN) is the deciding voice in created essentials for baccalaureate and graduate level nursing studies. These essentials define the curricular elements that must be present with Doctor of Nursing Practice (DNP) programs (AACN, 2020). Since these essentials outline the foundational competencies for all advanced practice nursing roles, they are also utilized by the project manager to discuss the implications that the QI project can have.

Essential I: Scientific underpinnings for practice. As the project manager, there is insight into what changes may be needed or requested by team members that are utilizing the checklist. Therefore, the information can be used to reflect and promote aspects of what to do next. In moving through the implementation phase, the next steps of the process would be to hard implement the project into practice. At this time, it is required to have use of the tool as optional.

This is a standard set forth by the Nursing Research Council (NRC) within the project site as it remains within the research phase. However, early implementation has resulted in many second phase actions. For example, three other pediatric medical teams are utilizing and implementing rounding tools to improve communication while the patient is within the pediatric unit. By having access to checklists as they pertain to specific medical teams and patient populations, communication and streamline admissions are more likely to occur. In order to move forward within the process of scientific underpinnings this checklist can be placed in a specifying "rounding" folder right outside the patient door, a central location for each patient. This will allow for ease of access, open communication and discussion of current status, daily updates, and a guide for questions as admissions progress. Prior to moving to essential II, this central location and implementation to daily practice can help evaluation the effectiveness of the tool as it becomes and actual part of practice and not an optional tool to utilize. Additionally, this process of a nurse driven, or nurse centered, rounding checklist has shown promise in research to improve attendance of nurses in rounding and nurses' confidence in the plans and goals for the patient (Ganesan et al., 2017). Having this improved communication and confidence could improve the overall sustainability of the project.

Essential II: Organization and systems leadership for quality improvement and systems thinking. Essential II focuses on the idea of organizational and systems leadership for quality improvement. This essential forces the project manager to assume and ensure accountability for quality care as well as patient safety. It was evident that there was a lack of communication as to patient diagnosis and patient goals which can often lead to very serious adverse events (Jayaprasad, 2016). By implementing a system wide communication tool, the project manager could identify key components of care that were lacking; therefore, interfering

with a quality level of patient care and safety. At the implementation level, the essential allows the project manager to revise the tool as factors of decreased care are identified. For example, there is a current concern that discharge teaching is lacking throughout the patient admission. Most often, education begins one to two days prior to discharge and forces the parents to take in a significant amount of information quickly while also demonstrating competency. This can result in delayed discharge by one to two days. By revising the tool to identify the top education requirements, nurses can begin teaching through the admission phase and continue to encourage and reinforce competency as discharge nears.

A second way to develop leadership for systems thinking is by hardwiring the rounding tool within the Epic charting system. By implementing the tool into the electronic system, access to the tool can be multifaceted. Team members can discuss the tool and patient status prior to rounding, after rounding, and as nurses reach out to providers with different questions. Having a rounding tool that is easy to follow and templated to a specific population can improve outcomes of rounding by engaging multiple team members and even prompting more relevant questions (Beck et al., 2016). It will also allow for improved communication in the event of a patient rapid response, illustrating the admission and recent events more clearly and streamline and having more members actively engaged in the patient progress.

Essential III: Clinical scholarship and analytical methods for EBP. As indicated early on through literature review, the advanced needs of a child with Congenital Heart Disease (CHD) cannot be outlined to encompass each child. Instead, the needs of each child and each diagnosis differ and can take a different path each time the disease is encountered. The literature review helped support the needs for strong clinical plans and communication in working with such a complex and diverse group. In order to meet the changing needs of this population, it is

crucial to have evaluation processes that can help measure and track patient outcomes and therefore provide a communication tool that can communicate to a vast majority of these needs. As the project facility continues to, and anticipates, more changes to this medical team and population, these methods of communication as well as outcome tracking must also be able to evolve. Therefore, it is anticipated that this communication tool will need to be embedded into the electronic system. This tool would then be used to communicate more effectively with multiple team members. Having access to this would help identify concerns that may be related to an impending rapid response or need for higher level of care and transfer back to the Pediatric Intensive Care Unit (PICU).

It too will become important to allow this tool to become available to the families of these patients. Currently, the project facility works with identification boards within the patient room. These boards allow nurses to identify themselves, the nursing assistance, the team, the date, and allows for patient questions or plan for the days. It is currently proposed, by the project manager and the pediatric cardiology team, to create a board that speaks directly to the cardiology families.

Research has indicated that the use of communication boards significantly increased the proportion of patients that knew: physicians and care teams, goals for admissions, estimated discharge and discharge requirements, and overall satisfaction with hospital stay (Tan, Evans, Braddock, & Shieh, 2012). While some barriers, including keeping them updated were found, staff satisfaction with communication was also noted (Tan et al., 2012). In this setting, the board could be updated to include feeding and medication weaning goals for the week as well as the progression of education for the parents. This not only helps the communication among team members but improves the involvements that the family has in taking part of the patient goals.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare. Essential IV looks at the possibility to design and select software that can improve the delivery of care within the healthcare system. The project site has access to the EPIC hardware system. This system allows for updates and improvements to the electronic medical record (EMR) and has options for flowsheets that can be utilized to communicate between floor nurses and pre-operative nurses that identify patient weight, height, nothing by mouth (NPO) status, patient identifiers, medication needs, and consent needs. This flowsheet is very specific to this setting and communication needs.

The project site has a representative for each general care area (surgical, medical, adult, & pediatric) that can help support areas as they identify different chart needs or ways to track charting. Therefore, if the transfer checklist remains accurate and efficient it is likely that the checklist could be converted into an EPIC flowsheet that can improve the delivery and quality of care provided to these patients. It is important to remember that one of the barriers to this implementation is time spent by nurses, this flowsheet remains a snapshot of the patient assessment and therefore does not become counterproductive to the care provided but could improve its efficiency among team members. This is supported as evidence as research shows a stronger likelihood that checklists are used when they are embedded into electronic charting (American Hospital Association [AHA], 2013).

Essential V: Healthcare policy for advocacy in healthcare. Complications within the pediatric cardiology population within the project facility were the basis for the student led project and proposed to the student in the initial meetings of how to best meet facility needs. As literary review and team discussion were had, it became evident that there was need for leadership in developing and implementing policy. The implementation of a checklist for this

population has required education for not only the stakeholders, PICU and Cardiology Senior

Attending's, but also residents, nurses, managers, and even the Director of Nursing. As this

project has developed, by the project manager, it has also been mirrored in the PICU, been

proposed as a Magnet goal for the Children's Intermediate Care Unit (CICU) and has been

shared amongst directors as an effort to improve patient length of stay. Upon completion of this

project, there are two platforms for project information to be presented, which will act as an

advocacy for nursing within the policy arena. These include the Clinical Practice Rounds and the

Cardiology care rounds, both of which are acts of participating in policy agendas that assist with

regulation of health care.

      Essential VI: Interprofessional collaboration for improving patient and population

health outcomes. Access to a highly susceptible care team at the time of project implementation

was anticipated to be very difficult. However, given the goal of the PICU Senior Attending,

Senior Cardiology Attending, PICU manager and Intermediate care manager to improve the care

and outcomes of the pediatric cardiology population, it was relatively well supported to have a

student led project integrated into the improvement process, especially given the student had

insight into the nurses and needs in moving forward. Effective collaboration and communication

was used to connect the nurses concerns with the physicians' goals that improved standards of

care and practice that could potentially be embedded as policy and practice requirements.

Additionally, the project did not pose and financial concerns, but could promote financial

improvements as it aimed to decrease length of stay not only in the intensive care unit but in the

hospital. Given this was a complex system and a state facility, consults between the senior

medical team was crucial and required up to date data and discussion with the project manager.

By implementing a checklist that could communicate not only with two different units but also

with multiple members of the care team, the system was seen as potentially easy to use, easy to

implement, and easy to sustain for a prolonged period of time, especially given there are

continued anticipated changes and growth within the pediatric cardiology population.

Essential VII: Clinical prevention and population health for improving the nation's

health. Project Tickers have been implemented in the past in regards to the pediatric cardiology

population; however, these have been poorly sustained with the transitions of care and care areas.

Therefore, it has been required that the project manager evaluates and implement change

strategies to improve quality and implement strategies to address gaps in care. This has required

meetings with different providers in various settings included on the intermediate care unit and

within the PICU. Prior to full embedment of this checklist into the EMR, it will be important to

integrate data to facilitate a continued improvement of care. By providing information that shows

decreased rapid response calls on this population and continuing to encourage nurse driven

rounding, the tool can remain in place as a standard of practice. This process alone has been

improved by the early implementation phases and had continued to grow among the rounding

cardiology physicians.

Essential VIII: Advanced nursing practice. The entire implementation of a nursing

communication tool works to mentor and support nurses while developing and maintaining

patient relationships. Given this particular population has had many challenges in their care over

the past year, it was crucial to create a tool that could not only increase the support that the

patients and families felt, but to ensure that nurses were feeling heard and supported in providing

safe quality care for the patients. The population and team members underwent several

challenges and therefore showing that positive outcomes could and should be made from this

was instrumental in getting buy in from the medical team members as well as the families.

Therefore, as this checklist moves to a more permanent position in patient care rounds, it too ensures that quality outcomes are not only identified but tracked throughout the progression of the care team.

Summary

Understanding how a project can be sustained within a large facility is a key component of project implementation. Without a plan for future implications and practice implementation it is likely that communication tools such as this checklist will fall out of practice, which has previously been seen within the project facility. Identifying negative factors helps the project move through the demands of everyday practice and makes it easier to implement into practice norms. By utilizing the AACN DNP essentials, the recommendations and success of the project is thoroughly supported and therefore allows the project manager to communicate with nurses and physicians involved in implementation.

Chapter Eight: Final Conclusions

In working within a large facility that cares for distinctly specialized populations, such as pediatric cardiology patients, there have been a number of positive and negative outcomes revealed. The project manager found a need for improved communication with pediatric cardiology patients transferring level of care. In an effort to improve this communication, and in turn the care provided, a transfer checklist (see Appendix D) was revised from a previously existing document in the facility. With the use of survey responses from the Children's Intermediate Care Unit (CICU), the document was updated and released for use within in intermediate care unit. The checklist remained in practice for three months and became the focus of the quality improvement (QI) project. The QI then looked at the significance, strengths, limitations, and benefits of implementing such a checklist in the setting. The process checkpoints at month one and month two looked to estimate success while also finding implications for future practice that may promote long term sustainability with more significant positive outcomes.

Significance of Findings

The findings of this QI project show the clinical significance for improved communication and readiness for pediatric cardiology patient transfers from high to intermediate levels of care. As the pediatric cardiology population remains clinically challenging, improved understanding between two units of care as well as symptom management and progression must be well defined between nurses once deemed ready for transfer by the intensive care unit providers. The findings, although limited, illustrate the need for this better prepared process of communication when transferring care levels which will only improve on the difficult care provided to these patients while improving clinical knowledge and confidence in the

intermediate care nurse. While this QI project concludes as a pilot project that could move

through another PDSA cycle with refinements, it acts as a needs assessment for the process of

improved communication within the intermediate care setting for pediatric cardiology patients.

This project helped to identify nursing concerns, and lack of continuity in the way that units

communicate for specific disease and procedures; thus, showing a need for a more sustained way

to communicate between two units for pediatric cardiology patients.

Project Strength and Limitations

      Strength. The primary strength of this QI project was the recognition of the ability to

create a tool that can communicate with nurses across two units as well as rounding physicians.

There is not a need for a multiple page communication tool but instead an easy to follow tool that

is not overwhelming for nurses to utilize. In having an easy to follow tool, it also supports that a

one page communication checklist, not embedded into the electronic system, does not require

nurses to have significant increase in work time or effort in completing such a form, and yet the

checklist improves communication and care. In recognizing these two components, the project

manager can see that the sustainability of the reimplementation of the tool is feasible with some

adjustments and increased education. Working with two units that have different acuity levels

was maintained through this project. There are some different requirements and requests between

the two and yet, as discussed, the tool can effectively maneuver through the units as the patient

transitions their care.

      Limitations. The primary limitation to this project was the overall number of

communication tools utilized that could illustrate the effectiveness of improved communication.

As the communication tool was not mandated for use, there were limited numbers thoroughly

completed from transfer to discharge (n=4). Although nurses within the intermediate care unit

verbalized concerns, understanding, and ease of the tool, nurses were not immediately pulling the communication tool for report and keeping it with the patient as recommended. Adjustments were made at the first check in which revamped the education tools and made them more visual to nurses (at each nurses station) and transitioned to a "cardiology patient" red folder that held the door signage and checklist. These two changes were aimed to remind nurses of the tool at time of transition and create one central location that could identify the patient and the tool. However, as mentioned, without mandated requirements this remained problematic.

The second limitation noted was the understanding that this tool could not be implemented into the EPIC charting system. Although there was no way to pilot if an electronic version would be more successful, it did present as a barrier that may come up in the future. Having an electronic version could help the tool communicate with physicians and nurses when not actively rounding on the patient or when a nurse calls with a concern. Future recommendations would look to make this communication universal for physicians, nurses, and families but would not have a place in the permanent electronic chart.

Project Benefits

The project benefits surround the communication tools ability to support an improved reporting system and knowledge of nurses in the intermediate care setting. Although there were not a significant number of tools utilized, it was well supported by the nurses and discussions indicated that nurses could see the benefits of a guided communication tool. The utilization of the tool did not show a significant decrease in the number of rapid responses called; however, it continues to support the knowledge of the top concerns for these calls (respiratory, feeding, weaning) . The communication tool is now a tool that could be beneficial during the discussions had by providers during these rapid response calls. For these reasons, the benefit of this project

was the ability to implement a previously utilized tool and ensure that it was still available, relevant, and had the ability to communicate between two units as well as between nurses and physicians. In ensuring that this tool was available for this, the project can be reconfigured, usage mandated, and performed again, ideally to produce a better assessment of a pediatric cardiology patient.

Recommendations for Practice

As the facility moves towards having this population in a designation area, this communication tool will also have the ability to become standardized as patients follow more standard clinical pathways set by the cardiology providers. Each of these components lends itself to benefit the care provided to a difficult and diverse population of pediatric cardiology patients through the progression of admission and discharge.

The recommendations for this project surround the effort to further promote the projects sustainability. As seen in review of the limitations, having the QI project be voluntary causes some significant hurdles in finding out how well the communication tool could last over time. With this, the primary recommendation is to perform a refined PDSA cycle. During a refined cycle, mandating use of the checklist can provide more data as to the outcome of improved communication and nurse understanding of care goals. Additionally, the cardiac folders and signage would be expanded upon and again be mandatory for every pediatric cardiology patient.

With the mandatory requirements of the communication tool, there will be more substantial numbers to evaluate. This will not only indicate the ease of use for intermediate care nurses but how effective it can be in communicating with both providers and families. Additionally, with more substantial values, the project facility may feel more supported in showing increased efforts to support a difficult population.

A limitation discussed was the inability to implement this tool into the electronic charting system. However, recommendations for in room communication boards may be feasible. A board that replicates the checklist could allow nurses and families to see what the current patient status is, discharge requirements, and continued goals. These would be visual reminders that could support communication during nurses' change of shift bedside report, communication with teams, nurses and families during patient rounds, and with families throughout their stay.

Final Summary

Working with a diverse and sensitive pediatric population has proven to be difficult and yet rewarding in the setting of a large project facility. Despite the limitations and hurdles set forth by the project and its outcome, the project has proven that more work is needed in standardizing the report on a pediatric cardiology patient as levels of care transition are made. As the facility continues to navigate the workings of the pediatric cardiology population throughout two units, and the expansion to perhaps a new location, a streamlined communication method for providers and families could play a significant role. It is crucial that all components of care work together to not only streamline the standards of the for providers and nurses but better equip families with the needed knowledge for post hospital care. It is evident that there will continue to be barriers to break down but it is just as evident that these children and providers desperately require the effort.

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Appendix A

Literature Matrix

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice
Beck Albert Johnsen Newhouse McGuire (2016)	Patient Goals and Quality & Safety checklists used to focus Pediatric Intensive Care Rounding	Patient goals and quality measures used to focus Pediatric Intensive Care rounding	Pre and Post-test design involving 32 bed PICU in Seattle Children's Hospital over 6-month period. Plan of the Day (POTD) template created. Post-test included Likert scale. Structured quality improvement design	Descriptive statistic met target completion goal of Quality & Safety Checklist at 82%, bedside report involvement met 90% goal.	Focused rounding improved engagement, charting time, and patient satisfaction.	Creating electronic rounding tool may be beneficial for multidisciplinary rounding tools.	Focusing rounding on patient goals and safety needs indicates improvement in rounding methods that decrease time and improve quality of care.
Vergales Addison Vendittelli Nicholson Carver Stemland Hoke Gangemi (2015)	Face-to-face handoff process of pediatric cardiothoracic surgery patients	Improvement of accuracy, efficiency, and communication driven by face-to-face handoff checklist	Six-month pilot of OR handoff post cardiac surgery	Descriptive statistics using 1-way analysis of variance method showing 94% expressed improvement in care	Formal process to drive post cardiothoracic surgery report to PICU.	Creating checklist that can follow patient post-op to discharge.	Face-to-face handoff allows for improved communication and a more guided and standard approach to discussing patient needs and outcomes.
Zavalkoff Razack Lavoie Dancea	Post cardiac surgery checklist used to promote error-proof	Medical handover checklist may decrease post-operative high-	Two phase prospective study in tertiary care PICU in North America, 33 consenting	Statistical analysis via t-test and regression analysis assessed 31 total patient handovers.	Checklist transfer process for pediatric patients post cardiothoracic surgery illustrates	Consider feasibility for this to be utilized throughout the	Address whether or not tool is disease specific or specific.

(2011)	medical handover from OR to PICU	risk events and improve patient continuity of care	healthcare providers	Resulted in improvement of medical and intraoperative information subscores, decrease in high risk events from 31.2% to 6.7%	the effectiveness of transfer checklists and does not display increased time or report.	hospital stay for each child	
Boydston (2018)	Does a Complex Care Checklist (CCC) increase support and collaboration in pediatric cardiology care rounds?	Multidisciplinary participation in rounds and use of CCC to improve continuity of care and increase patient understanding of medical goals	Pediatric Cardiac Intermediate Care Unit (PCICU) in 228 bed children's hospitals. PCICU with increased new staff and new beds (33% larger)	Joanna Briggs Institute Practical Application of Clinical Evidence System (JBI PACES) and Getting Research into Practice (GRiP) 95% of compliance in physician participating in rounds, only 67% improved nurse participation	Improvement of continuity of care for congenital heart patients can be enhance with more effective Multidisciplinary Rounds and care communication checklists.	Consider disease specific checklist for different cardiac post-operative needs	Address options for physician collaboration on checklist and connection to discharge planning tools.
Brunsveld-Reinders Kuiper de Jonge (2015)	Can adverse events during intrahospital transport (IHT) be avoiding by using a key information checklist?	High acuity patient transport adverse events occurred at nearly 70%, checklists aim to focus the information that requires close attention	29 bed adult mixed tertiary ICU in Leiden University Medical Center (LUMC) 5, 937 incidents reviewed in 26-month period Eleven guidelines	3 step approach to develop IHT checklist Average checklist time 4.5minutes	Introduction of standard checklists can improve communication with multiple units and be nurse driven.	Gives a framework for developing checklists- could be used for unit to unit review	Extend checklists to information needed once received by unit post transport

			and three checklists were basis for created template				
Ganesan Rajakumar Fogg Silvestri Kane (2017)	Nurse driven rounding checklists	Will nurse guided rounding checklist improve nurse satisfaction and participation in team rounds?	5-year implementation project in multidisciplinary medical surgical PICU.	Longitudinal pre-post interventional survey. 70% improvement of checklist criterion 98% of checklist showed discrete information of qualitative care goals.	Semi-structured rounding tool can be created and sustained to improve bedside nursing presence and understanding in rounds.	Consider electronic options for rounding tool for easy report/handoff guide	Address options for physician collaboration on checklist and connection to discharge planning tools.

Appendix B

Twenty-One Nursing Problems Theoretical Model

Halterman et al. (1998) provision of the Ten Steps to Identify Patient Problems:

1. Learn to know the patient.

2. Sort out relevant and significant data.

3. Generalize about available data in relation to similar nursing problems presented by

    other patients.

4. Identify the therapeutic plan.

5. Test generalizations with the patient and make additional generalizations.

6. Validate the patient's conclusions about his nursing problems.

7. Continue to observe and evaluate the patient over a period of time to identify any

    attitudes or clues affecting behavior.

8. Explore the patient and family reactions to the therapeutic plan and involve in plan.

9. Identify how the nurses feel about the patient's nursing problems.

10. Discuss and develop a comprehensive nursing care plan.

The Eleven Nursing Skills in the Theory:

1. Observations of health status.
2. Skills of communications.
3. Application of knowledge.
4. Teaching of patients and families.
5. Planning and organization of work.
6. Use of resource materials.
7. Use of personal materials.
8. Problem Solving.
9. Direction of work of others.
10. Therapeutic use of the self.
11. Nursing procedure.

Appendix C

Transfer Arrival Patient Status Chart

Transfer Date	Checklist Used	Anticipated Date of Discharge
5/13/2020	Yes	5/22

Appendix D

Pediatric Cardiology Transfer Checklist

Draft 1- Adapted Cardiac Checklist

History:
Surgery:

Goals	On Transfer:	Close Monitor:	Date Completed:

FEN/GI:
  1. Full Feed Goals/Tolerating
  2. Current IVF or nutrition			

CV:
  1. Current arrythmias
  2. BP Range
  3. BT Shunt/Pacer			

Pulm: 1. Current oxygen status			

Renal:
  1. Lasix schedule
  2. CMP Schedule			

Heme:
  1. Last Hemoglobin
  2. Lab schedule			

ID:
  1. Last fever
  2. Last Blood Culture			

Integ: 1. Wounds/Regimen			

Neuro/Sedation:
  1. Current Wean medications
  2. Date of IV sedation completion			

Lines/Tubes:
  1. Access
  2. Chest Tubes
  3. Gtube			

Psychosocial: 1. Any case management concerns			

Must Be Done Prior to DC:
  1. EKG
  2. ECHO
  3. Car seat Test			

Family Education Started/To be Done:
  1. Central Line
  2. Feeding Tube
  3. PCP Set up (post DC appt set up for 48 hrs. after DC)			

Family communication/DAILY: Post rounds please include main goals/changes for the day. Anticipated DOD. *RN please transcribe on whiteboard daily.			

```
        Day Shift     MD____ RN____     MD____ RN____     MD____ RN____
        Night Shift    MD____ RN____     MD____ RN____     MD____ RN____
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Appendix E

Intermediate Care Nurse Cardiac Survey

Pediatric Cardiology Transfer

1. What are your primary concerns when receiving a cardiac patient from the PICU? Please rank your top scores (1 as your top concern) and feel free to note other concerns.
   _____ Feeding
   _____ Respiratory Status
   _____ Wound Issues
   _____ Lines and Drains

   Other: _____
   _____

2. Do you feel as though all of your questions are answered when you receive report from the PICU on a cardiac patient?
   _____ Always
   _____ Sometimes
   _____ Never

3. Have you had an experience in calling a rapid response on a cardiac patient that came out of the PICU within the last 48 hours?
   _____ Yes related to _____
   _____ No

4. Do you feel as though the team (cardiology or PICU) relays pertinent information to you as the receiving nurse on new cardiac transfers to intermediate care within the first 24-48 hours?
   _____ Always
   _____ Sometimes
   _____ Never

5. Would you like to have a "checklist" regarding the current status and goals of the cardiac patient you are receiving from the PICU? This would be completed by the PICU nurse prior to transfer and then discussed with you.
   _____ Yes
   _____ No

6. Would you like having this type of checklist at the bedside of the patient so that we can continue to see and track cardiac goals? Such as: what are we weaning, what are our current feeds and goals.
   _____ Yes
   _____ No

Appendix F

Data Collection Tool: Nurse Survey

Total # of Surveys Distributed: _____
Total Participants: _____

	Identified as Top Concern	**Total**
FEEDING		
RESPIRATORY STATUS		
WOUND ISSUES		
LINES AND DRAINS		

Other Concerns reported:

➤ Do you feel as though all of your questions are answered when you receive report from the PICU on a cardiac patient?

Always	**Sometimes**	**Never**

➤ Have you had an experience in calling a rapid response on a cardiac patient that came out of the PICU within the last 48 hours?

Yes	**No**

➤ Do you feel as though the team (cardiology or PICU) relays pertinent information to you as the receiving nurse on new cardiac transfers to intermediate care within the first 24-48 hours?

Always	Sometimes	Never

➢ Would you like to have a "checklist" regarding the current status and goals of the cardiac patient you are receiving from the PICU? This would be completed by the PICU nurse prior to transfer and then discussed with you.

Yes	No

➢ Would you like having this type of checklist at the bedside of the patient so that we can continue to see and track cardiac goals? Such as: what are we weaning, what are our current feeds and goals.

Yes	No

Appendix G

Cardiac Rapid Response Tracker

Date of Call	Patient Diagnosis	Reason for PRRT Call	Checklist Available Y/N	Transfer Y/N	EPIC Audit Y/N	Additional Information
10/21/2019	*SDA/SDV*	*Respiratory Distress*	*Y*	*Y*	*Y*	*Pt was started on HFNC upon transfer*
Total						**1**

Appendix H

Post Rapid Response Tracker

Diagnosis	Patient Rapid Response Outcome	Number of Days in PICU	Original Anticipated Date of Discharge	Post Rapid Response Anticipated Date of Discharge	Days Passed Original Anticipated Date of Discharge

Appendix I

Organization Support Letter

Date: July 10, 2019
To East Carolina University College of Nursing:

We ███████████████████████████ have reviewed Aubreyana Buckner's DNP Project Proposal *Pediatric Cardiology Patient Transfer*. Aubreyana Buckner has organizational support and approval to conduct their Doctor of Nursing Practice student project within our institution. Our organization's liaison, or project champion, for the project is ████████████████

We understand that the timeframe for this project is from the date of this letter through August 1, 2020. Implementation at the project site will occur January 2020 through April 2020, unless otherwise negotiated. We understand that for Aubreyana Buckner to achieve completion of the DNP program, dissemination of the project is required by the University and will include a public presentation related to the project and submission to the ECU digital repository, The ScholarShip. In addition, we understand that ECU College of Nursing encourages students completing exemplary scholarship to develop a manuscript for publication, but that is not a requirement. Our organization understands and agrees that the student will not use our organization's name in the formal project paper or any subsequent posters, presentations, or publications.

Our organization has deemed this project as a process development project. Our organization is aware that this project will be processed first through our organizational approval process and then through the ECU College of Nursing process, which may include a formal review through University and Medical Center Institutional Review Board of East Carolina University (UMCIRB), if needed. Our organization *does* have an Institutional Review Board (IRB). We are aware that in the absence of an organizational IRB, the project will be submitted through the ECU College of Nursing review process which may include UMCIRB review if needed.

Thank you,

Appendix J

Estimated Project Budget

EXPENSES	Budget (Dollar Amt)	Actual	Difference
Staff Education			
Presentation to PCICU Committee Printing	10	10	-
Presentation to PICU Staff Meeting Printing	10	10	-
Presentation to Intermediate Care Printing	10	10	-
			-
			-
			-
Subtotal	30	30	-
Staff Recognition for Education			
PCICU	15	10	5
PICU	25	15	10
Intermediate Care	20	18	2
Subtotal	60	43	17
Technology Integration			
EPIC Embedding Annual allowance	10,000	-	10,000
[itemized expense]			-
[itemized expense]			-
[itemized expense]			-
[itemized expense]			-
[itemized expense]			-
[itemized expense]			-
Subtotal	10,000	-	10,000
Total EXPENSES	**10,090**	**73**	**10,017**
NET (Income - Expenses)	**(10,090)**	**(73)**	**(10,017)**

Appendix K

Diagnosis Coding System

Diagnosis	Three Letter Code
Hypoplastic Left Heart	LHS
Hypoplastic Right Heart	RHS
Tetrology of Fallot	FFT
ASD	SDA
VSD	SDV
Combination ASD/VSD	CSD
PDA	DAP

If patient has a secondary component, will be identified with two letter code hyphened after three letter diagnosis code. For example, a Hypoplastic Right Heart with Pulmonary Atresia will be identified as RHS-AP.

Secondary Components	Two Letter Code
Pulmonary Atresia	AP
Unrepaired	OP
Banding Complete	BP
BT Shunt	TS