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Activated Clotting Times and Rebleed Rates in Pediatric Patients Post Cardiac Catheterization: A Pilot Project Proposal

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Activated Clotting Times and Rebleed Rates in Pediatric Patients Post Cardiac Catheterization: A Pilot Project Proposal

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Executive Summary

Cardiac catheterization (CC) procedure is a minimally invasive procedure that requires arterial and/or venous access with the introduction of a small tube called a sheath that allows for the passage of wires and catheters into the heart. Heparin is a medication known as a 'blood thinner' that is administered throughout the procedure to prevent clots from forming. The activated clotting time (ACT) is a diagnostic point of care test used to measure how long it takes blood to clot. Post CC care requires patients to lie flat for several hours to ensure bleeding will not occur at the punctured vessel site. Therefore, the ACT is a significant factor to consider before pulling sheaths at the end of a CC procedure to reduce the risk of post procedure bleeding. Currently no pediatric protocol exists for appropriate ACT level for sheath removal post CC in the pediatric population. The project team proposes a pilot project to collect data by performing a retrospective chart review on whether the peak ACT and ending post procedure ACT greater than 180 seconds affect rebleed rates post procedure at a large pediatric hospital located in Central Ohio. Rebleeding post CC procedure requires extra monitoring of the pediatric patient and places the patient at risk for agitation and a prolonged hospitalization. The scholarly project proposal concludes with a discussion of the barriers endured while trying to complete the project and provides recommendations to mitigate such challenges for future projects.

Keywords: ACT, activated clotting time, rebleed, cardiac catheterization, pediatric

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According to the Center for Disease Control and Prevention (CDC) congenital heart defects (CHD) effects one percent of births per year in the United States (CDC, 2022). However, CHDs are the most common type of defects and are tracked and researched by the CDC (CDC, 2022). The CDC funds research programs and collects data on patients living with congenital heart disease throughout their lifespan, as well as the cost, survival rates, CHD related deaths, illness, and disabilities (CDC, 2022). After review of the CDC's website, CHD is not a limited priority condition due to the amount of precedence the CDC has placed on the surveillance of CHDs. The CDC is currently collaborating with multiple state departments of health across the United States to track individuals with CHDs through the lifespan (CDC, 2022).

Background

At a large pediatric hospital located in Central Ohio, children who are born with CHD are treated for a variety of heart defects in the cardiac catheterization lab. Many pediatric patients born with CHD also undergo cardiac surgery and require cardiac catheterizations throughout their life span. Cardiac catheterization (CC) procedures require arterial and/or venous access. Various methods for vascular access exist. However, the percutaneous femoral approach is the most utilized (Rezaei-Adaryani et al., 2009). CC procedure is a minimally invasive procedure that requires arterial and/or venous access with the introduction of a small tube called a sheath that allows for the passage of wires and catheters into the heart. Heparin boluses are administered throughout the procedure to prevent clots from forming. The heparin anticoagulation effect is monitored throughout the procedure by the activated clotting time (ACT), a diagnostic test used to measure how long it takes blood to clot. Post cardiac catheterization care requires patients to

lie flat for several hours, to ensure bleeding will not occur at the punctured vessel site. Therefore, the ACT is a significant factor to consider before pulling sheaths at the end of a CC procedure to reduce the risk of post procedure bleeding.

Problem Statement

As advancements in interventional cardiology continue, post cardiac catheterization care has not progressed at the same rate indicating a need for change that is safe, evidenced-based, and cost-effective (Matte et al., 2016). At a large pediatric hospital located in Central Ohio, no protocol exists with an appropriate ACT for sheath removal post CC. Variations in practice in the pediatric cardiac catheterization lab regarding appropriate ACT level for sheath removal has created wide variations and placed patients at increased risk for post-procedure bleeding based on investigator observation. A clinical trial from Parach et al. (2018) found that implementing evidence-based care guidelines for sheath removal improves patient's safety and has an effective role in reducing bleeding.

Significance of the Project

Cardiac catheterization (CC) is costly, on average for a pediatric patient the cost for CC ranges from $8,249 for diagnostic CC after orthotopic heart transplant to $38,909 for a transcatheter pulmonary valve replacement (O'Byrne et al., 2019). Therefore, efficiency in healthcare delivery by reducing rebleed rates post CC for pediatric patients will benefit not only patients, but hospital systems. In addition, nursing staff benefit by possibly reducing patient length of hospital stay, thus, reducing cost, and allowing for more efficient inpatient bed utilization (O'Byrne et al., 2019).

The literature regarding ACT and post-procedure bleeding is focused mostly on adults after percutaneous coronary intervention. Previous adult population studies have found a

correlation between bleeding frequency and high ACT (Berkowitz et al., 2021; Bagai & Beavers, 2020). The American College of Cardiology recommends for adult patients who received heparin during a CC procedure, to confirm ACT less than 180 seconds before sheath removal (American College of Cardiology, 2015). Taking this as a baseline, there is a gap in practice that exists in pediatric cardiac catheterization practice within central Ohio, because no protocol exists for safe ACT ranges for sheath removal post CC.

The nursing profession has experienced a decrease in workforce since the COVID-19 pandemic, and patient outcomes are affected by staffing shortages (Morris, 2021). Therefore, a change in policy for ACT measurement for sheath removal post CC will serve to provide a protocol for nurses to provide safe evidence-based care for sheath removal to prevent rebleeding post CC. Changing clinical practice in the CC lab is multidisciplinary. This project will help improve nursing practice efficiency based on evidence, which could potentially increase patient/family satisfaction, decrease cost to the patient as well as healthcare system by creating standardized procedures for sheath removal.

Goal of the Project

Currently, no pediatric protocol exists for appropriate ACT for sheath removal. However, evidence from an evidence summary by Leeper (2004) indicates that there is a higher probability of post procedure bleeding when the ACT is high (> 200 seconds) in the adult population. Therefore, the following question was utilized to develop the purpose for this project: 1) Does the peak ACT and ending post procedure ACT greater than 180 seconds affect rebleed rates post procedure? The American College of Cardiology recommends for adult patients who receive heparin, to ensure the ACT is less than 180 seconds before sheath removal. To implement best-practices in pediatric post CC care and align with the adult research, the purpose of this project is

to describe the effect of ACT and rebleed rates post procedure in pediatric patients (17 years and younger) following CC.

Project Objectives

To improve current practice at a large pediatric hospital located in Central Ohio, with no protocol for safe ACT range for sheath removal, the following objectives will be considered: 1) develop a protocol to decrease post procedure CC rebleed rates, 2) develop a protocol for safe ACT ranges for sheath removal.

Outcomes

If a correlation does exist between ACT and rebleeding post CC, the data will be presented to the key stakeholders and a proposed policy to create a specific ACT range upon sheath removal post CC will be recommended. Having a protocol will eliminate the variation in practice and provide the opportunity for an evidence-based care guideline to be developed for the improvement of patient centered care in the pediatric cardiac catheterization lab.

Constructs and Project Variables

To improve current practice at a large pediatric hospital located in Central Ohio, with no protocol for ACT sheath removal, a retrospective chart review will be used to identify ACT levels and rebleeding rates post CC. Approval by the institutional review board will be required with informed consent obtained before project implementation.

The conceptual definition of a pediatric patient is an individual who is 1-month to 17 years of age with congenital heart disease undergoing a CC with heparin. On completion of the project the data from the retrospective chart review will be evaluated. The anticipated outcome for this project is to determine if a correlation exists between ACT and rebleeding post CC and potentially propose a policy to create a specific ACT range upon sheath removal post CC.

Review of the Literature

To align with the current literature and implement best-practices in pediatric post CC care, the purpose of this project is to describe the effect of the ACT and post procedure bleeding in pediatric patients (17 years and younger) following CC. The PICOT format provides a framework for examining and answering a specific question related to the previously described problem, (Melnyk & Fineout-Overholt, 2005. The PICOT format was used to develop the clinical question as well as provide strategic key search terms to obtain the best evidence for this project. The four components include 'population of interest [P], intervention of interest [I], comparison of interest [C], and outcome of interest [O]' (Melnyk & Fineout-Overholt, 2005, p. 29). Therefore, the developed PICOT question is: (P) In pediatric patients (1-month to 17 years of age) with congenital heart disease (CHD) (I) who receive heparin during cardiac catheterization procedures are at increased risk for post-procedure bleeding following cardiac catheterization (CC), does the (C) peak activated clotting time and ending post-procedure activated clotting time greater than 180 seconds (O) affect rebleed rates post-procedure over (T) a one year timeframe?

Literature Review Strategy

The literature review search was conducted in Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Cochrane Library. Keyword and controlled vocabulary search terms included the following: CHD or congenital heart disease, cardiac catheterization, ACT or activated clotting time, heparin, and pediatric cardiac catheterization. The same search terms were consistently used throughout the systematic search process to ensure the same search strategy across multiple databases (Melnyk & Fineout-Overholt, 2019). The literature search yielded several studies of the adult population regarding ACT and post-procedure bleeding after

percutaneous coronary intervention (PCI). A common finding among the adult literature was that higher ACT was associated with bleeding and a higher probability of developing a hematoma the day after the procedure (Leeper, 2004; Rajpurohit et al., 2016; Tremey et al., 2006). However, Brener et al. (2003) study concluded that maximum ACT during coronary stenting did not correlate with bleeding complications.

The American College of Cardiology (ACC) and the American Heart Association (AHA) established clinical care guidelines that provided recommendations applicable to patients with heart disease. The ACC provided a post sheath removal protocol for percutaneous coronary interventions (PCI), which is a specific type of interventional cardiac catheterization typically performed in the adult population. The protocol recommended that patients who receive heparin need the ACT less than 180 seconds prior to sheath removal (ACC, 2015). Therefore, best practice is to apply existing knowledge and policies to improve the quality of patient care (Mall, 2019). Since anticoagulation is utilized in the majority of pediatric CC, considering the ACT for sheath removal is essential because a higher ACT at sheath removal is a risk factor for access site bleeding and/or hematoma (Wentworth et al., 2017).

Addressing the Gaps

After an extensive literature search, numerous adult studies suggested that higher ACT is associated with bleeding. After contacting various pediatric catheterization labs within the United States, it was identified that there is a variation in practice with ACT measurement and pulling sheaths post CC for pediatric patients. Therefore, to align with current literature and implement best-practices in pediatric post CC care, the purpose of this project is to describe the effect of ACT and post procedure bleeding in pediatric patients.

The findings from the adult research correlate higher ACT with post procedure bleeding. Therefore, to address the gap in practice, applying the knowledge from the adult research and developing a protocol to change practice would be beneficial for pediatric patients who undergo CC. Performing a retrospective chart review of the ACT prior to sheath removal and identifying the effects on post-procedure bleeding will potentially allow for a standardized pediatric protocol for ACT measurement for sheath removal to be created. The contribution of this project will help improve patient centered care in the cardiac catheterization lab based on evidence, potentially increase patient/family satisfaction, and decrease cost to the patient and healthcare system by creating consistent procedures.

Project Scaffolding

CC procedure is a minimally invasive procedure that requires arterial and/or venous access with the introduction of a small tube called a sheath that allows for the passage of wires and catheters into the heart. Heparin boluses are administered throughout the procedure to prevent clots from forming. The heparin anticoagulation effect is monitored throughout the procedure by the activated clotting time (ACT), a diagnostic test used to measure how long it takes blood to clot. Post CC care requires patients to lie flat for several hours, to ensure bleeding will not occur at the punctured vessel site. Therefore, the ACT is a significant factor to consider before pulling sheaths at the end of a CC procedure to reduce the risk of post procedure bleeding.

Currently no protocol exists for an appropriate ACT range for sheath removal for post CC. Variation in practice in the cardiac catheterization lab regarding appropriate ACT level for sheath removal creates wide variations and places the patient at increased risk for post-procedure bleeding based on clinical observations. When compared with the adult post CC care, pediatric post CC literature is lacking. To align with current literature and implement best-practices in

pediatric post CC care, the purpose of this project is to describe the effect of ACT and post procedure bleeding in pediatric patients (17 years and younger) following CC.

A retrospective chart review will be conducted using a convenience sample of pediatric patients that meet the inclusion and exclusion criteria. A root cause analysis (RCA) method for quality improvement and Imogene King's Theory of Goal Attainment will serve as the framework for the project. Success of the project will be determined by discovering whether a correlation between ACT and post-procedure bleeding exist in pediatric patients following cardiac catheterization and potentially propose a change in practice.

Theoretical Framework

Applying theory to practice is essential for the continual development of the nursing profession. From the knowledge gained through application of theory and research, best evidence for nursing practice is brought to fruition (Butts & Rich, 2018). This project's theoretical framework focus will be on Imogene King's Theory of Goal Attainment. King's personal and interpersonal concepts were utilized in developing the goal attainment theory (King, 1992). "The major concepts of goal attainment include communication, growth, and development, interaction, perception, role, space, stress, time, and transaction" (Butts & Rich, 2018, p.469). King's theory of goal attainment "focuses on holism and includes nursing as a process that is interactional in nature" (Butts & Rich, 2018, p.469). King's theory guides and directs nurses in the nurse-patient relationship and promotes mutual goal setting with their patients to meet high-quality health goals.

King's goal attainment theory can be applied to a multitude of situations in the nursing profession, for example, the theory can be applied to nursing practice, education, research, and administration (Butts & Rich, 2018). King's theory places the patient at the center focus as an

active participant with the nurse, working together to meet mutual goals. Thus, King's theory was chosen to guide this project based on the holistic approach of the person with a focus on improving patient outcomes by conducting a retrospective chart review to investigate if there is a correlation between ACT and post cardiac catheterization rebleed rates in pediatric patients.

Project Purpose

The project purpose is to improve current practice at a large pediatric hospital located in Central Ohio, with no protocol for ACT levels for sheath removal the following objectives will be considered: 1) provide a standard ACT for pulling sheaths to decrease bleeding post-procedure, 2) present the data and propose a policy for safe ACT levels for sheath removal. "In the literature, the exact activated clotting time corresponding to readiness for sheath removal varies between 160 and 175 seconds" (Mall, 2019, p.76). Therefore, the following questions were utilized to develop the purpose for this project: 1) Does higher post-procedure ACT levels correlate with increased rebleeding rates? 2) Will establishing sheath removal guidelines decrease variation in practice related to when sheaths are removed?

Study Method & Design

The study method will be mixed due to the nature of data being collected having both qualitative and quantitative properties. The root cause analysis (RCA) method for quality improvement and Imogene King's Theory of Goal Attainment will serve as the framework for the project. The RCA can be used to "identify and take steps to prevent repetition of events" referring to the variation in practice among providers within the pediatric cardiac catheterization lab (Finkelman, 2018, p.365). By utilizing the RCA method, identifying, and recommending a change to current practice will decrease the likelihood of variation in practice with ACT levels when pulling sheaths post CC. A retrospective chart review will be used to identify ACT levels

and rebleeding post CC, and if a correlation exists a proposed policy to implement safe ACT level upon sheath removal will be recommended utilizing the highest level of evidence in the literature.

King's theory can be utilized in clinical practice. Improving quality of care by utilizing King's Theory of Goal Attainment will align the project with the values of the organization. Reducing possible causes of rebleeding in pediatric patients post CC advocates for patients by decreasing further unfavorable vascular complications such as, hematoma, pseudoaneurysm, arteriovenous fistula, and retroperitoneal bleed.

Target Population & Enrollment

The target population will consist of pediatric patients with congenital heart disease undergoing a cardiac catheterization for diagnostic or interventional procedures between the ages of 1-month to17 years of age. A convenience sample of pediatric patients from within a one-year timeframe would be obtained, and five patient charts from each month will be reviewed. The inclusion and exclusion criteria were derived from a research study by Racic et al. (2020), that investigated whether pediatric post CC flat times could be safely reduced. Lying flat post cardiac catheterization is important to decrease the risk of post-procedure bleeding, hence, the rationale as to why the criteria was selected for this project. The inclusion criteria will consist of (a) patient age, (b) baseline and ending ACT documented in the electronic medical record prior to sheath removal, and (c) documentation of follow-up post-procedure. Exclusion criteria will consist of (a) neonates defined as 30 days or younger and patients older than 17 years, and (b) children with congenital bleeding disorders.

Ethical Considerations

Protection of Human Subjects

Human subjects' protection will be provided by deidentifying data to maintain confidentiality and no physical risks will incur because the investigator does not require contact with the human subjects. The consenting process will require a waiver of consent. Institutional Review Board approval of the site of the project and Otterbein University will be obtained. The data obtained from the chart review will be collected, deidentified, and placed into a secure, encrypted, password-protected excel spreadsheet accessible to only the principal and associate investigators of the project team. The project team would consist of the investigator, advisor, interventional cardiologists, cardiac catheterization staff, heart center research team, and the nurse manager of the cardiac catheterization lab. The clinical expertise of the team is appropriate for this project because they work with congenital heart disease patients every day and are knowledgeable about cardiac catheterization procedures and post procedure patient care.

Proposed Outcome Analysis Plan

Data Collection

The investigator will collect the data from Epic, the organization's electronic health record and analyze the data using Microsoft Excel spreadsheet that consists of patients initials, age, date of service, ACT level at baseline, ACT level post-procedure prior to sheath removal, and follow-up post-procedure documented. If rebleeding is noted on patient follow up post CC, the investigator will review the ACT level at baseline and post-procedure to see if there is a correlation between ACTs higher than 180 seconds and the incidence of patients rebleeding. The

results of the chart review will determine whether a practice change will be warranted to decrease the rebleed rates in pediatric patients.

Data Analysis

The tool that will be utilized is a check sheet in the format of an excel spreadsheet. The data collected will consist of patients initials, age, date of service, ACT level at baseline, ACT level post-procedure prior to sheath removal, physician initials performing the procedure, and follow-up post-procedure documented. A retrospective chart review of five patient charts from each month within a one-year timeframe will be selected based on the inclusion and exclusion criteria that was stated earlier Descriptive statistics will be used to analyze the data and Pearson's correlation coefficient statistical test will be used to measure the strength of the linear relationship between the two variables ACT and rebleeding with the utilization of the SPSS version 28 statistical software.

Anticipated Success, Limitations/Barriers, and Facilitators

Project Success

The project will be successful by completing the project within the timeframe and budget. The project will also be determined successful by describing whether a correlation exists between post CC ACT level and rebleed rates. If a correlation does exist between the two variables, the data will be presented to the key stakeholders and a proposed policy to create a specific ACT range upon sheath removal post CC will be recommended, which will eliminate the variation in practice as to what is an acceptable ACT level when removing sheaths post CC.

Limitations and Barriers

The anticipated barrier for this project is resistance to change from the cardiac catheterization clinical staff. Clinical staff in the pediatric cardiac catheterization lab at the

healthcare organization where this project is taking place are comfortable with the way things are and have a history of being resistant to change. Finkelman (2018) recommends understanding why staff might be resistant to change. After multiple conversations with the clinical staff, a common theme of no one listened to staff was revealed. To overcome the resistance barrier among clinical staff, establishing trust, including staff in the change processes, and showing them the data will help justify necessary changes. Physician buy-in is also an anticipated barrier for this project due to the level of autonomy physicians have and independent nature of the their practice.

Facilitators

Facilitators for this project include the interventional cardiologists, and the heart center research nurses. Engaging and identifying stakeholders who are engaged in the change process is imperative for successful change (Finkelman, 2018). The interventional cardiologists and heart center research nurses can effectively engage the cardiac catheterization clinical staff in applying the data from the project and improving patient outcomes because they have knowledge and expertise within the cardiac catheterization laboratory.

Proposed Budget and Timeline

The project budget will consist of the investigators time, which is valued at approximately forty-six dollars an hour. The estimated amount of time the investigator requires for data collection for the project is seventy-five hours, which is approximately four thousand six hundred dollars. However, the investigator will not be compensated for their time due to data collection occurring during non-working hours. The organization will provide deidentified copies of data, allow access to their cardiac catheterization case log, and provide access to the electronic medical record. The Microsoft excel program for data collection and data analysis

costs eighty dollars. However, this cost will not be incurred due to free access through Otterbein University.

The Otterbein University Institutional Review Board (IRB) application was submitted for the retrospective char review. The IRB application to the pediatric facility was submitted. Upon approval of both IRBs, data collection would need to begin by the investigator. Chart reviews would be conducted twice a week for two months. During the next two months the data would be analyzed, and the success of the project would be determined, with results disseminated, and needed intervention proposed.

Proposed Implementation and Anticipated Barriers

Healthcare studies produce vast amounts of data that enhance and improve patient's lives and the care that they receive. According to Kristensen et al. (2016), it takes decades for research to be implemented into clinical practice. Thus, this proposed project would help reduce the evidence-practice-gap that exists when improving clinical practice by raising awareness of ways to improve pediatric post cardiac catheterization (CC) care. Evidence from the project could be disseminated in small group formats, such as grand rounds, oral presentations, and roundtable presentations, health policy briefs, media, and on-the-job training (Melnyk & Fineout-Overholt, 2019).

The new knowledge that would be obtained from completion of this project would be disseminated and applied to the daily practice of the pediatric CC lab. Continual monitoring provides sustainability, and results in the desired outcome of reducing rebleed rates in pediatric patients undergoing cardiac catheterization. Consequently, when the pediatric CC lab clinicians realize the benefit to patient care, they will accept and utilize a safe pediatric activated clotting time range for sheath removal that will guide the development of a post sheath removal guideline

for pediatric patients that could be adopted throughout pediatric cardiac catheterization laboratories across the United States. The total impact of the project would be to provide better care and treatment to pediatric patients and reduce the gap in the literature.

Anticipated Barriers

The anticipated barriers to implementing this proposed project is lack of leadership support and professional attitudes towards change. The current culture of the pediatric CC lab is one that is resistant to change and does not set clear expectations of clinicians to provide evidence-based care, which is vital for evidence-based practice (EBP) implementation (Warren et al., 2016). The lack of autonomy and lack of inclusion in clinical decision making deters the clinical staff from wanting to engage in EBP implementation. The differing levels of education of the multidisciplinary team causes varying attitudes toward EBP. Warren et al. (2016) reported nurses that had higher degrees were more favorable of EBP, and knowledge gaps do exist among nurses and other healthcare professionals when producing and implementing EBP.

To overcome the lack of leadership support within the CC lab, engaging the heart center research nurses to facilitate implementing the findings of this project to the CC clinicians will prove advantageous due to their expertise in research, and experience in translating research into clinical practice. The heart center research nurses would also offer an authoritative presence where leadership support is lacking and cultivate a culture of inclusivity in clinical decision making through engagement and learning. According to Melnyk & Fineout-Overholt (2019), “peer group discussions can be very influential, and informal leaders may weigh in even stronger than formal leaders on whether practice change will actually occur” (p.276).

Other perceived barriers to implementing this project include short staffing that leads to high clinical workload and increased case duration due to having one CC lab. The anticipation of

increased case duration is a barrier because a standard for ACT range for pulling sheaths could slow down workflow and treatment productivity. Considering financial cost in one area may offset savings in another area such as workload, satisfaction, or additional expenses of patient complications when best practices are not implemented (Melnyk & Fineout-Overholt, 2019). Therefore, having appropriate timing and assessing culture readiness is imperative for successful implementation and sustainability of evidence-based practices (Finkleman, 2018). Hence, pediatric healthcare organizations that have larger facilities and resources may be better equipped to implement and standardize the proposed practice change of an ACT protocol for sheath removal.

Barriers to Project Implementation

As part of the development of the final scholarly project (FSP), the approval of the Institutional Review Board (IRB) is necessary. Approval through Otterbein University's IRB was obtained within two months of application submission. Originally the IRB application at the pediatric facility was submitted, processed for over five months then ultimately rescinded due to time constraints and no decision, which led to the project changing to a proposal format.

The first obstacle with the IRB project site was the investigator had to be employed by the hospital. The second obstacle encountered was the project investigator had to apply to be a principal investigator to submit an IRB application. After navigating through one obstacle the investigator submitted a research determination form to the project IRB. The IRB submission process of the determination form was confusing and not straightforward. The research determination form was finally returned after a month. The determination form revealed the study to be human subject research designed to contribute to generalizable knowledge surrounding the impact of clotting times on re-bleed rates. The investigator then had to submit a

new study using the short protocol template of the IRB submission system. The investigator then incurred a month delay while waiting for principal investigator approval in order to submit the short protocol. After the study was submitted using the short template protocol continued delays ensued and the study resided in pre-review state until the study was withdrawn by the investigator.

Recommendations

The recommendations for future Doctor of Nursing practice (DNP) students are to become very familiar with the project site IRB process early in the DNP program and start the IRB process at the project site two-three months earlier. "Understanding the IRB process and addressing areas of potential concern will help ensure smooth efficient and more predictable outcomes" (Moran et al., 2019, p.241). To help navigate the IRB process within the hospital another recommendation would be to create a Doctor of Nursing Practice liaison to assist students in their project journey. DNP programs should establish, develop, and strengthen relationships with clinical practice sites to assist DNP students' final scholarly projects because supporting DNP students throughout their project is critical (Morris et al., 2021). Lastly, large teaching hospitals should establish a streamlined approach to determining quality improvement projects versus human subjects' research to avoid prolonged IRB review times and enhance timeliness and efficiency (McIltrot et al., 2021).

Conclusion

Overcoming unforeseen circumstances is a huge part of the DNP journey. The proposed project can have a profound impact on pediatric cardiac catheterization post procedure care by decreasing rebleed rates. Thus, improving upon best practices when caring for a vulnerable patient population. With improving patient care being the primary goal there are still additional

benefits including improving hospital bed utilization, reducing cost, and reducing length of stay. This proposal adds to the DNP project ideas that future DNP students can expand upon.

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Appendices

INSTITUTIONAL REVIEW BOARD

☒ Original Review
☐ Continuing Review
☐ Amendment

Dear Dr. Chavez,

With regard to the employment of human subjects in the proposed research:

HS # 22/23-39
Chavez & Carey: Activated Clotting Times and Rebleed Rates in Pediatric Patients …

THE INSTITUTIONAL REVIEW BOARD HAS TAKEN THE FOLLOWING ACTION:

☒ Approved
☐ Approved with Stipulations*
☐ Limited/Exempt/Expedited Review
☐ Disapproved
☐ Waiver of Written Consent Granted
☐ Deferred

*Once stipulations stated by the IRB have been met by the investigator, then the protocol is APPROVED.

1. As Principal Investigator, you are responsible for ensuring all individuals assisting in the conduct of the study are informed of their obligations for following the IRB-approved protocol.
2. It is the responsibility of the Principal Investigator to retain a copy of each signed consent form for at least four (4) years beyond the termination of the subject's participation in the proposed activity. Should the Principal Investigator leave the university, signed consent forms are to be transferred to the IRB for the required retention period.
3. If this was a limited, exempt, or expedited review, there is no need for continuing review unless the investigator makes changes to the proposed research.
4. If this application was approved via full IRB committee review, the approval period is one (1) year, after which time continuing review will be required.
5. You are reminded you must promptly report any problems to the IRB and no procedural changes may be made without prior review and approval. You are also reminded the identity of the research participants must be kept confidential.

Signed: Noam Shpancer Date: 1-20-2023
IRB Chairperson

Data Points to be collected.

Patient initials	Age	Date of service	ACT Baseline	ACT peak	ACT at the end of procedure	Follow up documented
SC	17	Mm/dd/yr	145	225	245	Y or N