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Implementation of an Activity Protocol in the Acute Care Setting: A Quality Improvement Project

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Implementation of an Activity Protocol in the Acute Care Setting: A Quality Improvement Project:

A DNP project submitted in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice

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Approval

This is to certify that the DNP Project Final Report by

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has been approved by the DNP Project Team on

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for the Doctor of Nursing Practice degree

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Abstract

Background: Physical activity following cardiothoracic surgery can help decrease post-operative complications, expedite functional recovery, improve overall well-being, shorten hospital length of stay (LOS), and reduce morbidity and mortality (Miwa et al., 2017). Of these patients, 58% developed complications after cardiac surgery; of these complications, 31% were pulmonary, 16% were of cardiac in nature, and 14% were neurological (Yayla, 2018).

Purpose: This quality improvement project aims to implement an evidence-based protocol for evaluating the correlation between physical activity in uncomplicated post-operative coronary artery bypass and length of stay.

Methods: The Plan-Do-Study-Act (PDSA) tool from the Institute for Healthcare Improvement (IHI) guided the implementation phase. With guidance from an evidence-based protocol, staff were educated on the importance of activity post-operatively, provided with the evidence-based protocol, and guided through how to document in the electronic medical record (EMR). A weekly retrospective chart review was performed for 10 weeks to determine the activity status with biweekly reinforcements to ensure staff participation.

Results: The staff demonstrated compliance with activity documentation. The target rate for adhering to a maximum hospital stay of 5-7 days post-operatively was 60% for all patients that the criteria are applicable for use of the tool over the 10-week span. During the project, 65% (n=13) of patients out of 20 (n=7) met the length of stay criteria.

Conclusions: Activity status post-operatively provides a method that is safe, feasible and an effective intervention to prevent or lessen complications. Furthermore, it is cost-effective and simple to implement, requiring only minimal oversight by nurses and all members of the

healthcare team. The project provided insight into the importance of activity post-operatively not only for the patients, but for the organization's return on investment.

Keywords: post cardiac surgery, post heart surgery, coronary artery bypass surgery, early mobilization, early mobilization, early ambulation, length of stay, hospitalization, length in hospital.

Problem Identification

Background and Significance of Problem

While early mobilization following any surgical intervention has been shown to be both safe and feasible, prolonged bed rest remains common. Studies have confirmed this simple intervention decreases post-operative complications, expedites functional recovery, improves overall well-being, shortens hospital length of stay (LOS), and reduces morbidity and mortality (Miwa et al., 2017). Reported complications include lung infections, pleural effusions, impaired oxygen transport, delirium, deep vein thrombosis and nosocomial infections (Jacob et al., 2021).

According to Yayla (2018), 58% of patients developed complications specifically after cardiac surgery; of these complications, 31% were pulmonary, 16% were of cardiac in nature, and 14% were neurological. Additionally, Mungovan (2017), performed a study that incorporated physical therapy (PT), supervised physical activity, which increased levels of independent activity by more than half on average from post-operative day 1 (POD1) to post-operative day 5 (POD5), despite these sessions accounting for approximately 3% of the total postoperative time spent in physical activity (approximately 3 hours over 5 days).

Furthermore, mobilization delays can be costly, and affect turnover rates leaving no open beds for new patients. Therefore, early mobilization would mean not only decreased length of stays, but increased revenue. Implementing an activity protocol would require minimal oversight by nurses and other members of the healthcare team which would further decrease costs. Thus, the purpose of this project is to describe not only the need but the effects of early activity following post-operative cardiothoracic patients on length of stay.

Description of Local Problem

Presently, there is no formal policy or pathway for activity guidelines for coronary artery bypass graft patients or when to initiate such intervention. The expectation is that patients are to be out of bed every day, however, there is no guide to the appropriate timing of activity. The Cardiothoracic team recognizes this is an opportunity to provide their patients with a more consistent timeline for length of stay.

Organizational Priority

As a long-standing acute care facility with 652 beds, implementing an activity protocol is an organizational priority. This quality improvement (QI) project has the support of the Cardiothoracic Surgeon, Family Nurse Practitioner Danielle Schmitt, and Head Nurse (see Appendix E). The surgeon is passionate about activity among his coronary artery bypass (CABG) population. He articulated that he was on board with the project and is eager to see its progress.

Development of a Clinical Question

To ensure implementing an activity protocol is best practice, a literature search was conducted to answer the following practice questions: In uncomplicated adult postoperative coronary bypass patients (P), does a mobility plan (I) compared to no plan (C) affect length of stay (O)?

Evidence Review

External Evidence. A search of the following databases was conducted; CINAHL Complete, CINAHL with Full Text, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, MEDLINE with Full Text (see Appendix A). The key words searched were post cardiac surgery OR post heart surgery OR coronary artery bypass surgery; AND early mobilisation or early mobilization or early ambulation; AND length of stay or

hospitalization or length in hospital (see Appendix A). Combining search key words narrowed initial searches. Limits/filters for all searches included English language, adults (age 18 and over) and published between 2016 – 2022. Additionally, all searches pertaining to full text, and academic journals were applied. The subject and major heading included heart surgery. Inclusion criteria for article selection were heart surgery and ambulation. Tables 1 through 5 in Appendix A display the database, search terms, number of hits, number of articles reviewed, duplicates, and number of articles selected. A total of 10 articles were identified for appraisal.

Internal Evidence. Evidence from industry found that Miwa et al. (2017) conducted a level III evidence search regarding evaluation practices and treatment recommendations were made during protocol-driven ambulation orderlies in which ambulation frequency included patients ambulating a mean of 5.9±4.1 times during their entire post-operative stay. Specifically, the study found that patients walked an average of 5-6 times during their entire hospital stay, with dedicated staff as well as on their own and with family which decreased their hospital stay by one day. Jacob et al. (2021) conducted a level II evidence search and described enforcing an ambulation program revealed that early mobilization compliance generated participation of 95% and was sustained. Specifically, this program revealed that mean hours for initiating out-of-bed mobilization for patients' preintervention was 22.77, which was reduced to 11.74 postintervention, with a variance of 8.13 ($p<0.05$). These same patients were ambulated 12 hours after endotracheal extubation resulting in an 89% result of functional independence at POD 5 vs POD 6 (Jacob et al., 2021).

Evidence Appraisal, Summary, and Recommendations

Selected articles were read in full and critically appraised using the Melnyk and Fineout-Overholt (2019) LOE hierarchy tool (see Appendix C) for rapid appraisal. Articles with little

relevance, poor study methods, or inadequate reporting of results were excluded from the evidence. Critical information, appraisal comments and level of evidence for each appraised article are found in the evidence summary table (see Appendix B). The highest level of evidence (LOE) articles found were Wang (2020) and Yuji (2020) level I systematic reviews and meta-analyses; Jacob (2021) and Mungovan (2016) level II randomized controlled trials (RCTs) and quality improvement; Yayla (2019) and Miwa (2017) level III quasi-experimental with a control groups.

Miwa et al. (2017) found that total LOS decreased from 10 to 9, post-operative LOS median from 8 to 7, and post-operative LOS from 10 to 8.7. In Jacob et al. (2021) research study, it was found that ambulation is also a crucial determinant of hospital-stay length. Specifically, an evidence-informed program addressing unique barriers was found to be key in creating an early mobility routine. Mungoven et al. (2017) found that with supervised activity showed improvement in postoperative physiological functional capacity and reduces LOS in hospital following cardiac surgery. Yayla (2019) determined an early ambulation protocol shortened duration of hospitalization.

According to the synthesis table (see Appendix C; Table 1), recommendations that link the research to practice include increasing mobilization strategies. All of these articles explored education but did not specifically identify who, when, or how education should be provided and specific timing. With certainty, mobilization coincides with increased quality of life/functional status definitively with decreased LOS (see Appendix C; Table 2). Therefore, utilizing a team-based approach with knowledgable resources will allow for a smooth implementation. Benefits of implementing and increasing activity immediately post-operatively include: 1) improving

quality of life, 2) decreasing complications, 3) shortening length of stay, 4) positive revenue with increased turnover.

Project Plan

The global aim of this project is to implement an evidence-based activity protocol. The expectation is that by implementing a tool, there will be increased awareness on the importance of activity post-operatively, increased compliance with documenting activity status, less complications, and decreased length of stay. During the 10-week pilot, the project will encourage staff to implement the recommendations of the activity protocol. The expectation of implementing this proposed activity plan is to distinguish whether having a mobility plan versus no mobility plan improved patient outcomes such as decrease in length of stay. The following are the goals of the project:

Project Goals

1. Identify best practices for a mobility plan and the targeted population.
2. Educate nurses on the evidence-based tool and proper documentation during each activity encounter.
3. Implement educational sessions on importance of mobility post-operatively and location of proper documentation.
4. Gather evidence weekly to ensure staff compliance.
5. Perform chart reviews to monitor appropriate documentation, mobilization among this population is taking place.
6. Perform chart reviews to monitor appropriate documentation and mobilization among this population and shorten length of stay among the target population.

EBP/QI Model/Implementation Model

The Institute for HealthCare Improvement Model (IHI) uses the Model for Improvement to guide improvement work and accelerate quality improvements (IHI, 2023). The model consists of two parts: 1) three fundamental questions and 2) the Plan-Do-Study-Act (PDSA) methodology. The first portion consists of what the organizations would like to accomplish, how it will be recognized as an improvement, and what change could be made to accomplish the change (IHI, 2023). The PDSA methodology is a QI tool that encourages ongoing evaluation of clinical care, thus improving various aspects of patient care (Stratton, 2022). Applying this framework to the proposed project will guide the implementation of the QI project. Additionally, it allows for gradual progression of a change; therefore, project managers can assess what changes are worth adopting (Stratton, 2022). Consequently, the Model for Improvement will be the foundation guiding the project.

Context/Organizational Assessment

Description of the Setting and Population

The facility location the project was implemented is a New York State public-benefit corporation located in New York. Their vital mission is to provide the highest-quality care for all residents of the Hudson Valley regardless of ability to pay. Specifically, they build on its long tradition of delivering the most advanced services in the region by providing a fiscally sound network that ensures access to a coordinated continuum of care for its community. The project setting will be at the main campus in New York on the Cardiothoracic Stepdown Unit.

Participants will include adult uncomplicated coronary artery bypass patient population. Average age range between 18-80 years old, including both male and female patients with current average length of stay 5-7 days.

Key Stakeholders and Buy-In

Key stakeholders for this project include the Cardiothoracic Surgeon, Family Nurse Practitioner Danielle Schmitt, Head Nurse, and DNP advisor Dr. Susan Penque Ph.D., ANP-BC, NE-BC, DNP Project Faculty Advisor from Sacred Heart University, this writer, staff members (including nurses and patient-care technicians), and patients.

The incentive for the surgeon was that implementing an activity protocol meant higher turnover rates which means more new cases can be performed. As a result, the more patients increase the number of total surgeries performed and as an outcome, brings in more revenue. Head Nurse and Practice Mentor Danielle Schmitt expressed interest in the use of the pathway due to its simplicity and evidence-based foundation.

The project leader will convey the project, its goals, and strategy. Therefore, appropriate time was allotted for feedback and mitigation of possible barriers. As a result, expectations include increased project understanding and promotion of stakeholder buy-in of the new pathway. The tool will provide clinicians with an effective evidence-based instrument intended to yield better health outcomes. A contractual agreement was obtained (see Appendix E), a letter of approval (see Appendix F), and an agreement was signed in support from a practice mentor (see Appendix G).

Description of Practice Change

Implementation of more documentation can cause distress to those documenting and resistance to change. Keeping this in mind, the practice change that will be implemented involves little to no additional documentation as it is already embedded in the electronic medical record (EMR). Therefore, this is readily available and easy to navigate.

Three documents will be provided for staff upon piloting the project along with verbal and kinesthetic reinforcement. This tactic is to tackle all learning styles for those who learn in different manners. The first handout will be the importance of activity post-operatively for this population. The second handout will be the proposed evidence-based protocol to help guide activity flow during the patient's stay. This protocol is referred to as the Critical Pathway for Coronary Artery Bypass Grafting. This pathway includes pre-op or office visit the patient is to maintain ambulatory status (basic activities of daily living), day of surgery to be out of bed to chair x1 after extubation, post op day #1 out of bed to chair every 8 hours thereafter, post op day #2-3 ambulate x3 in room with assist then hallway x4, then post op day #4-5 to have ambulated x6 in hallway; stair climb x12 stairs x1 (Bojar, 2021) (see Appendix H). The third handout is a guide on how to document appropriately in the EMR. The implementation process will pilot on January 16th, 2023.

Evaluation Plan

During the pilot evaluation of the implementation process measures, outcome measures, data collection, and analysis will be collected by the project team. Process measures will include those participants that meet the criteria, their activity status, and complications following surgery. Outcome measures will include the number of eligible patients being discharged within the 5–7-day goal. The project leader will be onsite weekly to perform retrospective chart reviews of those that met the inclusion requirements. A typed log of the data will be secured by excluding patient identifiers to ensure there is no violation of HIPAA. Data will include age, surgery, surgery date, transfer to the stepdown unit (SDU), activity by day, length of stay, and patient specific barriers. At the completion of the data collection period, the typed data will be entered into Excel and displayed via charts and graphs.

Barriers and Facilitators to Implementation

Barriers to implementation on a corporate level could include low on the priority list and concern of exposure of data connected to corporations' reputation. Mitigation to these barriers includes providing information and data on reimbursement and revenue. Additionally, reassurance that all information is confidential, and that the facility name will be removed during the presentation process.

Barriers to implementation on a local level include (a) resistance to change; (b) staff perception of increase in workload (burnout); (c) lack of staff. Plan to address barriers include educating nurses on importance of activity post-op and the role it has on patient outcomes; no new documentation, readily available in Cerner, one-click and complete; including all activity participants such as nursing assistants, nurses, physical therapists and counting as activity, therefore, the responsibility of activity does not solely rely on nursing staff except when entering activity status.

Sustainment

Clarification on the return on investment to all involved will increase support. It will be beneficial to address benefits to each sector of employees so that individual needs are met. The simplest group to address will be the newly graduate or newly hired staff as they are more likely to engage in the intervention as it is now all they know versus burnt out or seasoned staff who are resistant to change due to a familiarity with a certain workflow. Furthermore, consistent communication is essential to the continuation of the intervention long after its completion.

Timeline (see Appendix G):

- **September 2, 2022** – Meet with the surgeon, Danielle Schmitt, the senior educator, and head nurse to obtain organizational leadership and support for project. Agree upon PICO and goals of the project.
- **September 6, 2022** – Complete Collaborative Institutional Training Initiative (CITI) and submit to appropriate parties.
- **September 22, 2022** – Complete literature review and recommendations for practice and submit for approval from faculty advisor.
- **October 21, 2022** – Complete plans for project evaluation and submit to practice mentor, faculty advisor, and all other parties involved.
- **November 2, 2022 –** Final proposal to practice mentor, faculty advisor, and all other parties involved. Apply for exempt status to IRB.
- **January 06, 2023 -** Approval from the educator and project approval committee at facility.
- **January 16, 2023** – Pilot DNP project.
- **March 27, 2023 -** Complete pilot, weekly audits (Mondays), biweekly educational sessions.
- **April 9, 2023** – Interpret data for meaningful use.
- **April 19, 2023** – Practice oral presentation with DNP advisor. Official IRB approval received.
- **April 24, 2023** – Oral project presentation 1600 hours via Zoom and submit final project.
- **November 2023** – Dissemination of project to Sacred Heart University Davis & Henley College of Nursing and consideration to Connecticut's' Nurses Association.

Resources

Anticipating the financial needs of the project will ensure its sustainability. Appendix H displays the projected cost of the project implementation and evaluation. The project manager will spend 8 hours per month x 10 weeks = 18 hours managing the entire project. The time will be spent on project education, implementation, reviewing feedback, data collection, chart audits and analysis. Extra displayed costs are related to printing supplies. The EMR template where activity documentation will be embedded is in the EMR (Cerner) at no additional cost. There will be no need for IT support as they are already trained, and it is encompassed in their job description to troubleshoot any technical issues. No training will be required of the staff as they were trained in this during their orientation to the hospital EMR; only reinforcement will be necessary.

Dissemination

Visual, auditory, and tactile learning styles will be considered. Visual aids will engage the audience, increase their understanding of the content, while conveying important messaging. Auditory aids will allow those who are multitasking to listen while performing work duties. Tactile will allow them to have hands on. Tackling all three learning styles allows for reinforcement of the QI initiative.

On the unit, a copy of the handouts with the proposed protocol recommendations, complications, and EMR instructions (see Appendices J, K, L) will be available to all staff in the unit binder and displayed above the time clock. In addition, emails to employees will be sent out on a biweekly basis during the pilot period to not overwhelm them. Furthermore, ongoing communication should occur at planned and casual intervals. Planned communication involves

sharing information during weekly huddles while unplanned communication includes casual workplace conversations or mini huddles.

Ethical Review

This project has been reviewed and approved by the surgeon, Family Nurse Practitioner Danielle Schmitt, Head Nurse, and Dr. Susan Penque Ph.D., ANP-BC, NE-BC, DNP Project Faculty Advisor. Appendix I illustrates that the requirements for a Quality Improvement criterion have been met. An answer of "yes" to all the items in l-10 and "no" to all the items in 11-14. Therefore, this project does not qualify as human subjects' research. However, it requires Sacred Heart University Institutional Review Board approval (see Appendix P). As a QI project, this project does not require Institutional Review Board (IRB) approval, the project team applied for this exemption.

Implementation

PDSA Cycle One

Plan Phase

The DNP student collaborated with the surgeon, Family Nurse Practitioner Danielle Schmitt, and Head Nurse to gain support for the use of the Critical Pathway for Coronary Artery Bypass Grafting presented by Bojar (2021) in this practice. Approval was received by all involved including the educator and project approval committee on January 6th, 2023.

Before going live with the implementation, the project leader collaborated with the project mentor Danielle Schmitt to identify the specific population requirements. After this was decided, potential barriers were discussed to mitigate them ahead of time. This included resistance to change, burnout, and staffing concerns. It was decided that reinforcing that there was no extra documentation might appeal to the staff.

The project mentor suggested creating a sheet where the nurse practitioners could track uncomplicated CABGs that were anticipated to arrive on the stepdown unit as a means of making the staff aware of what population to focus on upon arrival to the unit. It was initially discussed to have manual tracking on sheets of paper on the door for each qualifying patient, however, the Head Nurse declined this idea as it would interfere with the Det Norske Veritas, Inc. (DNV) guidelines who were due to arrive within the 10-week pilot. Project goal #1 was addressed within this phase.

Do Phase

The pilot was piloted on January 16th, 2023, on the Cardiothoracic Stepdown Unit at the facility. It is important to note that the senior educator who originally was involved, was not responsive once the pilot commenced. Implementation of this project entailed initiation of the Critical Pathway for Coronary Artery Bypass Grafting (Bojar, 2021). The process began with an informational session during the monthly huddle that included handouts about the importance of activity in this population and setting, education of the tool to staff regarding the pathway, and proper location for documentation of such intervention when performed.

The project leader created and utilized handouts focused on the relevance of activity and ambulation in this population, provided copies of the pathway, and EMR (Cerner) documentation (see Appendices J, K, L). The presentation was followed by an open question and answer session. Those unable to attend this educational session were emailed a copy of the handouts and informed that there are copies readily available in the unit binder. Also, staff were provided with the project leader's email address should questions arise during the process. Project goals #2, 3, and 4 were addressed in this phase.

Study Phase

During this phase, the project leader analyzed the data and determined improvement significance. Weekly chart audits to measure staff compliance and results were performed accordingly. Data was reviewed with the practice mentor at the halfway point of five weeks to discuss alternative action. During the initial five weeks, between January 16th, 2023, and February 20th, 2023, 8 of the 11 patients 72.7% (n=8) followed the LOS goal of 5-7 days with ambulation occurring greater than three times daily independently despite complications. One of the patient's days of surgery was prior to the January 16th, 2023, start date, however, his discharge date was during the pilot, so he was included in the study, even though his length of stay was 8 days. The data from this phase were used to inform the next phase within this process. Project goal #5 was addressed in this phase.

Act Phase

Based on the data, the expectation to achieve a 60% or higher in length of stay post-operative for uncomplicated CABG patients was attained. An additional PDSA cycle was conducted for the last five weeks of the implementation with refinements from the first PDSA cycle to determine if additional efforts could increase the percentage further than the attained 72.7%.

PDSA Cycle Two

Plan

Modifications to the workflow were communicated to Danielle Schmitt and the project leader. Further barriers were discussed with the project mentor such as float nurses and employee turnover. Mitigation for these barriers included discussion on how to ensure staff awareness and documentation of activity. It was decided that designating project champions, one on day shift

and one on night shift who would function as a source of continuity. One day nurse volunteered and even offered to forward the forms to the day group chat via text messaging. The night project champion was requested to do the same and agreed.

Do

This phase began the week of February 20th, 2023, and concluded the week of March 27th, 2023. Text messaging delivered; project champion; mini huddles.

Study

During the last five weeks, 5 of the 9 patients 55.6% (n=5), followed the LOS goal of 5-7 days with ambulation occurring greater than three times daily independently despite complications.

Act

The conclusion of the second PDSA cycle marked the end of the 10-week project. Based on the results, providing project champions along with text messaging did not affect length of stay. External factors seem to play a role in the length of stay and delayed discharge, which will be discussed in later sections.

Description of Deviations

There were two deviations from the original plan that occurred. The first deviation was that one of the cardiothoracic surgeons unexpectedly had back surgery. This decreased the number of cases that could be performed. The second deviation was that another surgeon abruptly resigned to populate his own practice in an adjacent state, further decreasing the cases performed. As a result, this left one surgeon and his cases and the patients the project was applicable to which was 20 patients (n=20). These deviations created a small sample size which affected the project results.

Evaluation/Results

Process Measures

A total of 20 patients (n=20) met the project qualifications. This included participants that had uncomplicated coronary artery bypass surgery. Average age range between 18-80 years old, including both male and female patients with current average length of stay 5-7 days. This analysis is depicted in a pie chart that can be found in Appendix M.

Of those 20 patients (n=20), activity status compared to the proposed evidence-based protocol, the 13 (n=13) who were discharged within the anticipated length of stay were close to the proposed activity levels. This meant they were independent ambulating x3 upon discharge. Additionally, it revealed that male patients were more active than female patients. This analysis is depicted in a line chart illustrated in Appendix N.

After comparing the data from those discharged to their activity status, it was concluded that analysis of factors impacting discharge should be considered. Therefore, an analysis of the complications delaying discharge was also created to analyze discharge timing. There were numerous causes to discharges greater than the 5–7-day project goal which can be visualized in Appendix O.

Outcome Measures

During the 10-week project, 13 patients of the 20 met the criteria with a length of stay 5-7 days from their surgery date. Activity level was pivotal to discharge, however, did not reflect the occurrence of complications. Complications should be further investigated as it played a role in delaying discharge.

Completion of the pilot yielded that 65% of the target population met the goal of discharge by 7 days post-operatively. The protocol recommends these patients be discharged

within 5 days post-operatively, however, uncomplicated CABGs are not as uncomplicated as they have been historically which is why the discharge goal was 5-7 days. Following an evidence-based protocol was a guide as to what is to be expected each day post-operatively, but this protocol was not realistic for this population base.

As a result, there is more awareness on the importance of ambulation post-operatively and proper documentation. Staff are indicating to the project leader that they are documenting their patient's ambulatory status. If adherence to a protocol is a prospect for the future, substantial numbers would need to be considered, proper awareness and education. Ultimately, it will allow for high-quality care, shorter hospital stays, and increased revenue.

Return on Investment

Healthcare organizations ensure they are appropriately and efficiently reimbursed for their services. As this is certainly beneficial to the provider, it is equally beneficial to the patient because they are discharged sooner, decreasing their length of stay.

Over the 10-week period, staff compliance increased biweekly as reinforcements were provided via handouts, email, mini huddles, text messaging, and project champions. Upon auditing, those who were not documenting were provided gentle reminders the importance of activity/ambulation post-op, the pathway, and how/where to document the activity. However, there were staff members who declined to participate, referring to causes as "burnout" or declining to participate as it did not "benefit" them.

The target rate was 60% for all patients that the criteria is applicable for use of the tool over the 10-week span. A total of 20 patients were analyzed that fit the criteria. During the project, 65% (n=13) of patients out of 20 (n=7) met the length of stay criteria (see Appendix I). Less complications were associated with activity and early ambulation; however, external factors

were a major contributing factor for delayed discharge. Between the nurses, nursing assistants, and nurse practitioners, activity was encouraged and expected daily.

Key Lessons Learned

The goal of this project was to attain 60% of the desired population length of stay to 5-7 days and the outcome was 65% which was slightly higher than the expectation. The value that was attained from analysis of the barriers was beneficial and will help guide future projects. Identification of the root causes resulted in important lessons learned.

The first lesson learned was that involving physical therapy in the project would have been beneficial. After analyzing the data, physical therapy consultations were initiated on Day 2 for each patient. Additionally, they could educate the staff on the number of feet each landmark on the unit is. The second lesson learned was to collaborate with all physicians to plan accordingly when physicians will be actively performing surgeries so there is increased sample size. The third lesson learned was to have on-going communication among project champions and stakeholders to ensure forward movement and success. Furthermore, a mandatory annual self-learning module that is specialty specific would be valuable.

Sustainability

Sustainability on a corporate level providing data that correlates with improved outcomes, reinforcing the pathway via dissemination from superior roles within the service, and convincing the surgeon to adopt a plan as its outcomes would lead to increased turnover, more patients equaling increased revenue. Sustainability on a local level will need to be driven by factors such as designated shift champions (one for days, one for nights), celebratory quarterly treats, responsiveness to inquiries from staff, integration to huddles/emails, and improv as time progresses.

Dissemination

Traditional Dissemination

An executive summary outlining the project and significant outcomes will be submitted to the surgeon and Head Nurse (see Appendix Q). The project results, key lessons learned, and implications for the organization will be presented at the quarterly QI committee meeting by the project leader. The project is scheduled to be presented in November 2023, in poster format for The Sacred Heart University Davis & Henley College of Nursing faculty and students as part of the DNP program requirements.

Non-traditional Dissemination

This type of dissemination takes the change and results outside the organization to public forums and organizations. Submitting a poster presentation at a state conference such as the Connecticut Nurses' Association or a New York State Nurses Association conference will be considered.

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Appendix A

Description of Evidence Search

PICO Question:

In adult postoperative coronary bypass patients (P), does a mobility plan (I) compared to no plan (C) affect length of stay (O)?

Description of Evidence Search

A search of the following databases was conducted**;** CINAHL Complete, CINAHL with Full Text, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, MEDLINE with Full Text**.** The key words searched were post cardiac surgery OR post heart surgery OR coronary artery bypass surgery; AND early mobilization or early mobilisation or early ambulation; AND length of stay or hospitalization or length in hospital. Combining search key words narrowed initial searches. Limits/filters for all searches included English language, adults (age 18 and over) and published between 2016 – 2022. Additionally, all searches pertaining to full text, and academic journals were applied. The subject and major heading included heart surgery. Inclusion criteria for article selection were heart surgery and ambulation. Tables 1 through 5 display the database, search terms and results of search. A total of 10 articles were identified for appraisal.

Table 1.

CINAHL Complete Search Terms and Search Results

Search Terms	Number of hits	Number of articles reviewed	Duplicates	Number of articles selected
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery	171	12		0
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation	13	4	3	2
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation AND length of stay or hospitalization or length in hospital	6	4	4	2

Table 2.

CINAHL with Full Text Search Terms and Search Results

Search Terms	Number of hits	Number of articles reviewed	Duplicates	Number of articles selected
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery	171	12		0
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation	13	4	3	2
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation AND length of stay or hospitalization or length in hospital	6	4	4	2

Table 3.

Cochrane Central Register of Controlled Trials Search Terms and Search Results

Search Terms	Number of hits	Number of articles reviewed	Duplicates	Number of articles selected
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery	192	16		0
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation	4	3	2	0
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation AND length of stay or hospitalization or length in hospital	3	3	2	0

Table 4.

Cochrane Database of Systematic Reviews Search Terms and Search Results

Search Terms	Number of hits	Number of articles reviewed	Duplicates	Number of articles selected
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery	6	2		0
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation	0	0	0	0
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation AND length of stay or hospitalization or length in hospital	0	0	0	0

Table 5.

MEDLINE with Full Text

Search Terms	Number of hits	Number of articles reviewed	Duplicates	Number of articles selected
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery	3521	12		0
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation	9	5	1	1
Post Cardiac Surgery OR Post Heart Surgery OR Coronary Artery Bypass Surgery AND Early Mobilisation or Early Mobilization or Early Ambulation AND length of stay or hospitalization or length in hospital	9	5	9	1

Appendix B

PICO Question: In adult postoperative coronary bypass patients (P), does a mobility plan (I) compared to no plan (C) affect length of stay (O)?

Citation	**Conceptual Framework**	**Design/ Method**	**Sample/Setting**	**Major Variables Studied and Their Definitions**	**Outcome Measurement**	**Data Analysis**	**Findings**	**Level of Evidence/ Quality**	**Quality of Evidence: Critical Worth to Practice**
Author Year Title County Funding	**Theoretical basis for study**		**Number Characteristics Exclusion criteria Attrition**	**Independent variables IV1 = IV2 = Dependent variables**	**What scales used - reliability info (alphas)**	**What stats used**	**Statistical findings or qualitative findings**	**Level =**	**Strengths Limitations Risk or harm if implemented Feasibility of use in your practice**
Article 1									
Saki Miwa, MD, MPH, Paul Visintainer, PhD, Richard Engelman, MD, Amanda Miller, RN, Tara Lagu, MD, MPH, Erin	N/A.	Quasi-experimental design. Method using a pre-post intervention analysis and interrupted-time series approaches.	**Sample**: 447 and 478 patients in the pre- and post-AO intervention groups. **Inclusion criteria:** Underwent: -Coronary artery bypass grafting -Valvular	**IV1** = ambulation orderlies **IV2**= ambulation counts **DV** = length of stay	-Student's t-, Mann-Whitney U -Chi-square tests -Piecewise regression analysis; multivariable piecewise regression.	-JMP®, Version 12.0.01 (SAS Institute Inc., Cary, NC, 1989-2014) -Microsoft Excel (2010). Statistical significance was defined as an alpha of 0.05.	Hospital outcomes comparing pre- vs post-AO data: introduction of the AO program resulted in significantly reduced mean and median variability in post-operative length of stay (p=0.03 for means; p=0.05 for medians).	Level III/low quality	**Strengths**: help patients achieve a higher level of ambulation, the program was well received by the staff, cost-effective, and simple to implement. **Limitations:** 1. Lack of information on ambulation levels prior to the AO program. 2. Do not know whether the mechanism of improvement in hospital outcomes. 3. Increase in patient ambulation r/t to whether an unidentified factor may have caused

Woodbury, MS, Peter K. Lindenauer, MD, MSc, and Quinn R. Pack, MD, MSc. 2017. Effects of an ambulation orderly program among cardiac surgery patients. No funding reported.			procedures -Transferred to the post-cardiac surgery floor between August 7, 2013 and February 8, 2014. **Exclusion criteria:** -Expired during the surgery, ICU -Directly discharged out of the hospital from ICU.		-Time series. -Five-item Likert-scale		Ambulation frequency: patients ambulated a mean of 5.9±4.1 times during their entire post-operative stay. Staff satisfaction: Eighteen of the 26 daytime nurses and patient care technicians responded to our survey, giving us a response rate of 69%.		the significant change in the initially flat baseline trend. **Risk or harm if implemented:** none indicated. **Feasibility**: succeeds in showing how a simple intervention such as the use of AOs can have a significant impact on hospital outcomes among post-cardiac surgery patients.

Article 2									
Prasobh Jacob, Poonam Gupta, Shiny Shiju, Amr Salah Omar, Syed Ansari, Gigi Mathew, Miki Varghese, Jinsograce Pulimoottil, Sumi Varkey, Menandro Mahinay, Darlene Jesus, and Praveen Surendran. 2021. Multidisciplinary, early mobility approach to enhance functional independ	N/A.	Randomized controlled trials (RCTs); quality improvement	**Sample**: 1320 participants included in the programme between March 2015 and June 2019. **Setting:** 12-bed CTICU unit-adult postcardiac surgery patients at Heart Hospital in Doha, Qatar **Inclusion criteria:** > 14 years of age had CABG, valve repair or replacement surgeries, or aortic dissection repair admitted to CTICU. **Exclusion criteria:** -Postcardiac surgery requiring mechanical/ circulatory devices to maintain hemodynamic stability -Glasgow Coma Scale score below 13, those with limited	**IV** = early mobilisation **DV** = functional independence	-ICU Mobility Scale (IMS). -Numerical rating scale. -Standard control chart. -Welch's t-test.	Generated using QI macros with Excel V.2016.	-Early mobilisation compliance: Participation reached 95% by May 2016 and was sustained. -Out-of-bed mobilisation: mean hours of out-of-bed mobilisation for patients' preintervention was 22.77, which was reduced to 11.74 postintervention, with a variance of 8.13 ($p<0.05$). Quality of evidence: -No adverse events -Early ambulation - the patients were ambulated 12 hours after extubation. -Functional independence at discharge - 89% of functional independence at POD 5 vs POD 6	Level II/high quality	**Strengths:** demonstrated that a well-designed QI process is effective in implementing changes that result in improved patient outcomes. An early mobility programme is safe, feasible and beneficial. The project accomplished the objectives by applying various tests of change based on identified barriers. This project reduced the time to the first out-of-bed mobilisation and facilitated early ambulation, thus improving functional independence in patients. **Limitations:** cannot comment which one has the most impact and which one has the least one, no control group, and LOS was not measured – ALTHOUGH the explored factors are also crucial determinants of hospital-stay length. **Risk or harm if implemented:** none indicated. **Feasibility:** these improvements have been sustained through multidisciplinary staff and patient education, an integrative approach and regular monitoring.

ence in patients admitted to a cardiothoracic intensive care unit: a quality improvement programme. No funding reported.			preoperative mobility and developed postoperative complications.						
Article 3									
Sean F. Mungovan 1,2,3 , Preetraj Singh, Gregory C. Gass, PhD, Neil A. Smart, PhD and Andrew D. Hirschhorn, PhD. 2016. EFFECT OF PHYSICAL	N/A.	Randomized controlled trials (RCTs).	**Sample**: 83 adult patients undergoing cardiac surgery. **Setting:** Westmead Private Hospital, Sydney, NSW, Australia. **Inclusion criteria:** Waiting cardiac surgery via a median sternotomy. **Exclusion criteria:** Emergency surgery; non-English-	**IV** = physical activity **DV** = postoperative physiological functional capacity	-*t*-tests. -Pearson product-moment correlation coefficient. -Spearman's rank correlation coefficient. -Two-tailed tests. -Patients were fitted for: SenseWear Pro 3 Armband.	SPSS Statistics 17.0 for Mac.	-One-way analysis of variance and independent samples t-tests were used to compare PT-supervised vs independent physical activity -Repeated-measures analysis of variance compare male:female participant groups postoperative period POD1–POD5. -The Pearson product-moment correlation coefficient used to assess presence and strength of correlations between PT-	Level II/high quality	**Strengths:** PT-supervised physical activity foster improvements in PPFC and reduces LOS in hospital. **Limitations:** 1. Further research into the barriers to independent physical activity after cardiac surgery and interventions to promote independent physical activity in a larger cohort of males and females, is warranted. 2. Arm swinging for Armband not accounted for. 3. Treating physiotherapists were not blinded to physical activity data, which may have influenced the advice/encour - agement they gave to patients regarding independent activity.

ACTIVITY IN THE FIRST FIVE DAYS AFTER CARDIAC SURGERY. No funding reported.			speaking; age < 18 years; and musculoskeletal, neurological, or peripheral vascular impairment precluding unaided mobility.				supervised exercise and independent physical activity. -Stepwise multiple regressions predicted daily and overall PT-supervised exercise and independent physical activity step count and time ≥ 3 METS for all patients with sex, age, BMI, VC, operation time and post-operative ventilation time used as co-variates. -Spearman's rank correlation coefficient used to assess correlations between PT-supervised exercise and independent physical activity step count and time ≥ 3 METs and postoperative length of stay (LOS) in hospital. -Two-tailed tests with a 5% significance level.		4. Limited number of female patients in the current study precluded sex-specific regression analysis of their independent physical activity levels. 5. Unexpected pathway (e.g. ventilation). **Risk or harm:** none indicated. **Feasibility:** feasible because our vented population we do get out of bed to chair and for the majority they do not crash and need intubation as frequently – more stable.
Article 4									
JianiWang[a]DianxuRen[b]YueLiu[a]YanlingWang[a]BohanZhang[a]QianXiao. 2020. Effects of early mobilizati	N/A.	Systematic review and meta-analysis.	**Sample:** 39 articles. **Inclusion criteria:** keywords such as design, RCT, adult population, ICU, intervention: early mo-bilization and rehabilitation, control: daily	**IV** = early mobi-lization **DV** = recovery of critically ill patients	-Electronic databases -Pooled risk ratio -Weighted mean difference -Corresponding 95%	Review Manager v5.3 software	-Improved ventilator-associated pneumonia patients' Medical Research Council score; - -Reduced incidence of intensive care unit-acquired weakness and intensive	Level I/high quality	**Strengths:** strict inclusion and exclusion criteria. **Limitations:** **1.** Small sample size **2.** Some studies had high-risk of bias **3.** Differences in baseline characteristics, diseases, and age ranges of patients increased the heterogeneity. **Risk or harm if implemented:** none indicated.

on on the prognosis of critically ill patients: A systematic review and meta-analysis. No funding reported.			nursing care, primary out-comes, secondary outcomes. Inception up to December 31, 2019. **Exclusion criteria:** none.		confidential interval		care unit-related complications -No statistically significant differences in handgrip strength, delirium rate, intensive care unit mortality, hospital mortality, and physical function- and mental health-related quality of life at 2–3 months and 6 months post-hospital discharge.		**Feasibility:** early mobilization can improve muscle strength in critically ill patients, reduce incidence of ICU complications, shorten duration of mechanical ventilation and length of ICU and hospital stays.
Article 5									
Ayşegül Yayla PhD RN 2019. Effects of early mobilization protocol performed after cardiac surgery on patient care outcomes. No funding reported.	N/A.	Quasi-experimental with a control group.	**Sample:** 102 patients (51 patients each in the experimental and control groups). **Inclusion criteria**: Underwent cardiac surgery between January and October 2015. **Exclusion criteria**: none.	**IV:** early mobilization **DV:** post-operative outcomes	-Richards-Campbell Sleep Questionnaire (RCSQ) -Duration of hospital stay (post-operatively). -Development of a post-operative late complications form were used to collect data.	Unknown.	Experimental group had better improvement in RCSQ scores, shorter duration of hospitalization, and fewer late complications after surgery than patients in the control group.	Level III/low quality	**Strengths:** better sleep patterns, shorter duration of hospitalization, and fewer late complications after surgery. **Limitations:** small sample size. **Risk or harm if implemented** **Feasibility:** early mobilization is feasible in adult cardiac surgery patients and has significant benefits.

Article 6									
Yuji Kanejima, Takayuki Shimogai Masahiro Kitamura, Kodai Ishihara, and Kazuhiro P. Izawa. 2020. Effect of Early Mobilization on Physical Function in Patients after Cardiac Surgery: A Systematic Review and Meta-Analysis. No funding reported.	N/A.	Systematic review and meta-analysis.	**Sample:** Six RCTs comprising of 391 patients following screening of 591 studies studying early mobilization in patients after cardiac surgery. **Inclusion criteria:** -No restrictions on language, publication date, and publication status. -18 years of age undergoing open cardiac. **Exclusion criteria:** no restrictions on frequency, intensity, or type and time of intervention.	**IV:** early mobilization **DV:** physical function	-Electronic databases -Weighted average "random-effect model" -Corresponding 95% confidential interval	EZR software.	-The distance walked during the 6-min walking test improved by 54 m (95% confidence interval, 31.1–76.9; I^2 = 52%) at hospital discharge.	Level I/high quality	**Strengths:** **Limitations:** 1. Sample size 2. Some studies from > 10 years ago 3. On-pump vs off-pump CABG 4. Respiratory exercise and psychoeducation at same time as mobilization. 5. 6-minute walk was not isolated from other functional testing. 6. Mortality and hospital readmission were not considered. **Risk or harm if implemented:** none indicated. **Feasibility:** Early mobilization after cardiac surgery also tended to be combined with respiratory exercise and psychoeducation. Further study is required to examine the effectiveness of early mobilization with increased numbers of studies and patients and for other types of cardiac surgery.

N/A= Not Applicable

Appendix C

Levels of Evidence Synthesis Table: PICO Question:

In adult postoperative coronary bypass patients (P), does a mobility plan (I) compared to no plan (C) affect length of stay (O)?

X (copy symbol as needed)	**1**	**2**	**3**	**4**	**5**	**6**
Level I: Systematic review or meta-analysis				X		X
Level II: Randomized controlled trial		X	X			
Level III: Controlled trial without randomization	X				X	
Level IV: Case-control or cohort study						
Level V: Systematic review of qualitative or descriptive studies						
Level VI: Qualitative or descriptive study, CPG, Lit Review, QI or EBP project						
Level VII: Expert opinion						

LEGEND

1= Miwa et al., 2017. **2=** Prasobh et al., 2021. **3=** Mungovan et al., 2016. **4=** Wang et al., 2020. **5=** Yayla, 2019. **6=** Kanejima, 2020.

Outcome Synthesis Table: PICO Question

⬆, ⬇, —, NE, NR, ✓ (select symbol and copy as needed)	**1**	**2**	**3**	**4**	**5**	**6**
QOL	⬆	⬆	⬆	—	⬆	⬆
CH	✓	✓	✓	**NE**	✓	✓
CABG	✓	✓	**NE**	**NE**	**NE**	✓
EM	⬆	⬆	⬆	⬆	⬆	⬆
ED	**NE**	⬆	**NE**	**NE**	**NE**	⬆
PP	✓	✓	**NE**	**NE**	✓	**NE**
LOS	⬇	⬇	⬇	⬇	**NE**	**NE**

SYMBOL KEY

↑ = Increased, ↓ = Decreased, — = No Change, NE = Not Examined, NR = Not Reported (introduced at beginning but never reported at the end), ✓ = applicable or present

LEGEND

1= Miwa et al., 2017. **2=** Prasobh et al., 2021. **3=** Mungovan et al., 2016. **4=** Wang et al., 2020. **5=** Yayla, 2019. **6=** Kanejima, 2020.

QOL = quality of life/functional status; CH = cardiac/heart surgery; CABG = coronary artery bypass surgery; EM = early mobilization/mobilisation/ambulation/activity; ED = education; PP = program/protocol; LOS = length of stay (hospitalization)

Appendix D

Appendix E

Appendix F

DR. SUSAN L. DAVIS, R.N.,
& RICHARD J. HENLEY
COLLEGE OF NURSING
Sacred Heart University

BSN- FNP/DNP Hybrid Program
DNP Project Practice Site Mentor — Letter of Agreement

A. Student and Faculty Information: (Please type)

Student Name: __Crystal M. Ryan__

Student Telephone # and Email Address:

_____

ryanc4@mail.sacredheart.edu

B. Faculty Project Advisor Name and Email Address:

Dr. Susan Penque

penques@sacredheart.edu

C. DNP Project Site Mentor Information (Please type):

Mentor's Name and Credentials:__Danielle Schmitt, FNP_____

Position and Title: Cardiothoracic Nurse Practitioner_____

Facility Address:_____

City, State, Zip_____

D. Consent to Mentor the Student for the DNP Project.

I am authorized to mentor and support the above student with the DNP project development and implementation at this facility. I received a copy of the DNP project course objectives, DNP project practice mentor overview, and student responsibilities workflow as it relates to my role in the project (attached below). If applicable, I will support the student with IRB application (or equivalent) for this project. I will provide feedback to the student during the course of the DNP project. I agree to participate in the final approval of the DNP project proposal and coordinate an opportunity for the student to present his/her final DNP project to the appropriate personnel at facility.

Practice Mentor Signature:___Danielle Schmitt, FNP_____

Updated Nov 2020

Appendix G

Student Name: Crystal M. Ryan

Project Title: In adult postoperative coronary bypass patients (P), does a mobility plan (I) compared to no plan (C) affect length of stay (O)?

Project Faculty Advisor: Sue Penque, PhD, ANP-BC, NE-BC

Project Mentor: Danielle Schmitt, MSN, FNP

	Doctor of Nursing Practice Project Roadmap	
Component	**Definition**	**Date Done (Anticipated Date)**
Phase 1: Problem Identification and Evidence Review		
Clinical Inquiry including background and significance of problem	Describe local problem and its significance. Include data to frame local problem.	09/02/22
Organizational priority	Summarize information that supports topic/problem is an organizational priority.	09/02/22
Searchable Question	Write a focused, searchable question using an established method (e.g. PICO).	09/02/22
Evidence search	External evidence • Summarize search strategy (e.g. databases, keywords, filters/limits, criteria for article selection, tools for critical appraisal). Include practice-based evidence (e.g. evidence-based solutions that experts/other health systems have implemented to address practice problem).	09/02/22
	Internal evidence • Summarize applicable unit/community/department/hospital/organizational level data or data required for national entities (e.g. CMS, NDNQI, AHRQ).	09/02/22
	Perform needs assessment if applicable.	N/A
Evidence appraisal, summary, and recommendations	Organize evidence that answers focused clinical question in a clear concise format (e.g. table or matrix).	09/02/22

	Appraise literature for quality and applicability of evidence using established method (e.g. Johns Hopkins Nursing EBP Research Evidence Appraisal Tool, Joanna Briggs Institute Critical Appraisal Tools, Fuld Institute for EBP critical appraisal tools etc.).	09/02/22
	State recommendations(s) and link to evidence strength and quality and risk/benefits.	09/02/22
Phase 2: Project Planning		
Project goals	State intended, realistic outcomes of project using established method (e.g. SMART criteria).	10/21/22
Framework	Select framework/model to guide implementation (e.g. EBP model, QI framework, Change model).	10/21/22
Context	Describe project setting and participants or population, or other elements that are central to where the change will occur.	10/21/22
Key stakeholders	Identify agencies, departments, units, individuals needed to complete the project and/or affected by project, and strategies to gain buy-in.	10/21/22
Practice change/intervention	Provided detailed description of practice change or intervention (e.g. new or revised policy).	10/21/22
Evaluation	Summarize plan for evaluating the effectiveness of the practice change. Identify applicable process and outcome data to be collected/tracked and tools to do this. Identify the methods for analyzing/interpreting the data (e.g. control, run or Pareto charts).	10/21/22
Possible barriers to implementation	Identify possible barriers and implementation strategies to mitigate these barriers.	10/21/22
Sustainment	Identify strategies to sustain the change.	10/21/22
Timeline	Create a realistic timeline for project completion.	10/21/22
Resources	Identify all resources (e.g. indirect and direct) needed to complete the project.	10/21/22
Ethical merit	Identify and obtain the required review and approval needed for implementation (e.g. institution, community agency, IRB).	01/06/23 04/18/23
Phase 3: Implementation		
Implement project	Carry out the project using selected implementation framework/model.	01/16/23
	Track any deviations/changes from the project plan.	Weekly
Phase 4: Evaluation		
Results/Interpretation	Using an established method (e.g. run or control charts) display data and interpret project outcomes.	Weekly
	Report evaluation of the effectiveness of the practice change, including extent the practice change was implemented (process	Weekly

	outcome) and extent to which the desired outcome(s) were achieved.	
Return on investment	Identify the final resources that were used to implement the project. Calculate and report the return on investment.	03/27/23
Phase 5: Dissemination		
Traditional	Disseminate to the project setting in a manner meaningful to them (e.g. executive report, poster, presentation at a meeting, poster with QR code to access details of project, etc.) Disseminate in the format required by the academic institution (e.g. poster, public presentation) and Prepare final project write-up using established reporting guidelines (e.g. EPQA, SQUIRE) and academic institution requirements.	01/16/23
Non-traditional	Develop a website to display project, use personal or program social media (e.g. Twitter, Facebook) to share project information.	11/2023

PICO, Population, Intervention, Comparison, Outcome; **CMS**, Center for Medicaid and Medicare Services; **NDNQI**, National Dataset of Nursing Quality Indicators; **AHRQ**, Agency for Healthcare Research and Quality; **SMART**, specific, measurable, attainable, relevant, timely; **IRB**, Institutional Review Board; **EPQA**, Evidence-Based Practice Process Quality Assessment Guidelines; **SQUIRE,** Standards for Quality Improvement Reporting Excellence

Appendix H

Cost Analysis

Expense	**Cost**	**Budget**
Printing/Supplies		
Educational Handouts Pathway and Cerner Instructions	Staples Hammermill Copy Plus 10 Ream Paper (8x11) – 500 sheets = $41.99	$41.99
Educational		
Emails	$0.00	$0.00
Text Messaging	$0.00	$0.00
Project Manager	$0.00 (DNP Project)	$0.00
FNP/Mentor Assisting with Project Implementation	$0.00 (Volunteer)	$0.00
Total Budgeted cost	$41.99	$41.99

Appendix I

Differentiating Quality Improvement and Research Activities Tool

Question	Yes	No
1. Is the project designed to bring about immediate improvement in patient care?	X	
2. Is the purpose of the project to bring new knowledge to daily practice?	X	
3. Is the project designed to sustain the improvement?	X	
4. Is the purpose to measure the effect of a process change on delivery of care?	X	
5. Are findings specific to this hospital?	X	
6. Are all patients who participate in the project expected to benefit?	X	
7. Is the intervention at least as safe as routine care?	X	
8. Will all participants receive at least usual care?	X	
9. Do you intend to gather just enough data to learn and complete the cycle?	X	
10. Do you intend to limit the time for data collection to accelerate the rate of improvement?	X	
11. Is the project intended to test a novel hypothesis or replicate one?		X
12. Does the project involve withholding any usual care?		X
13. Does the project involve testing interventions/practices that are not usual or standard of care?		X
14. Will any of the 18 identifiers according to the HIPAA Privacy Rule be included?		X

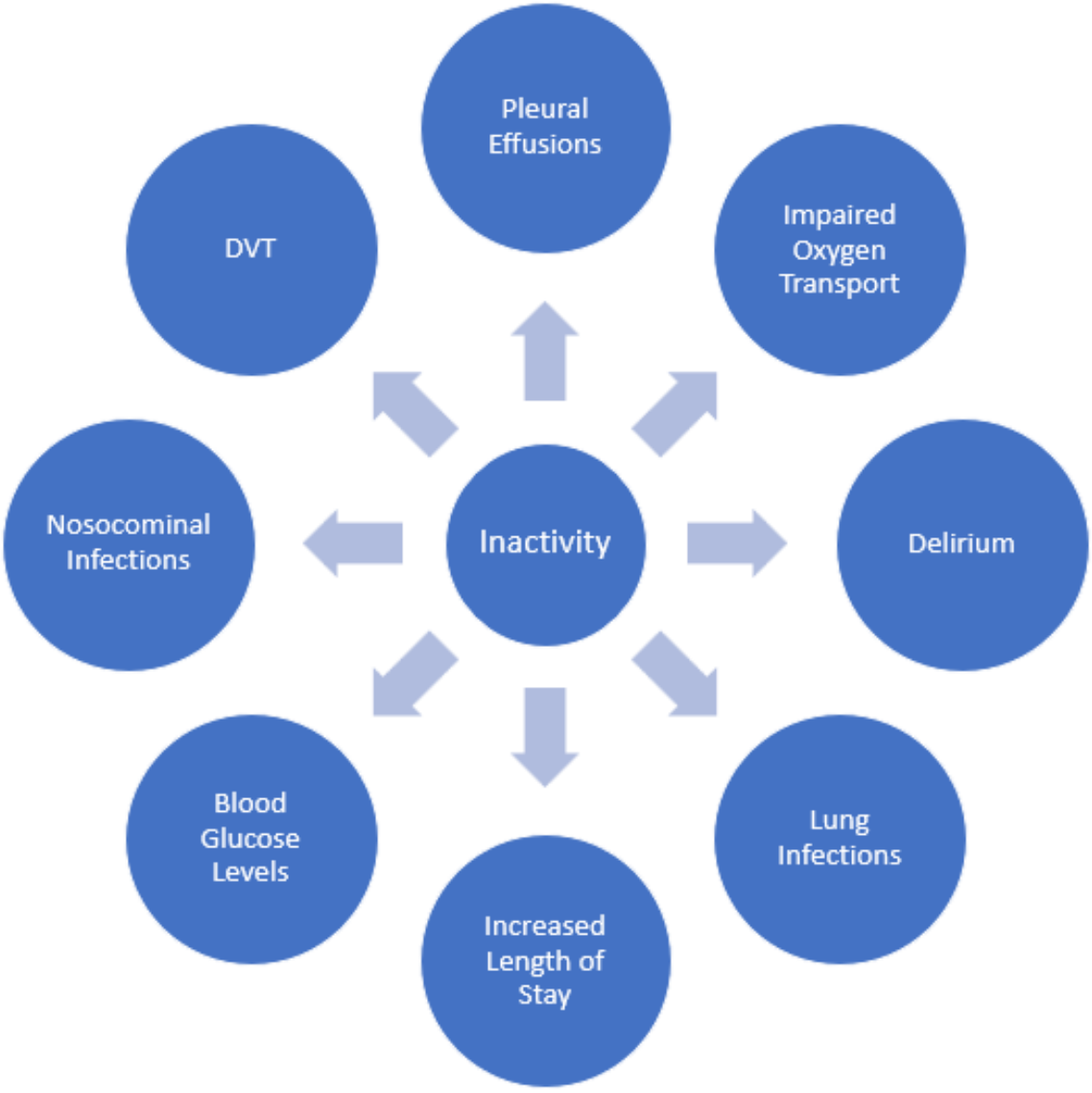
Appendix J

Table 13.1 • Critical Pathway for Coronary Artery Bypass Grafting

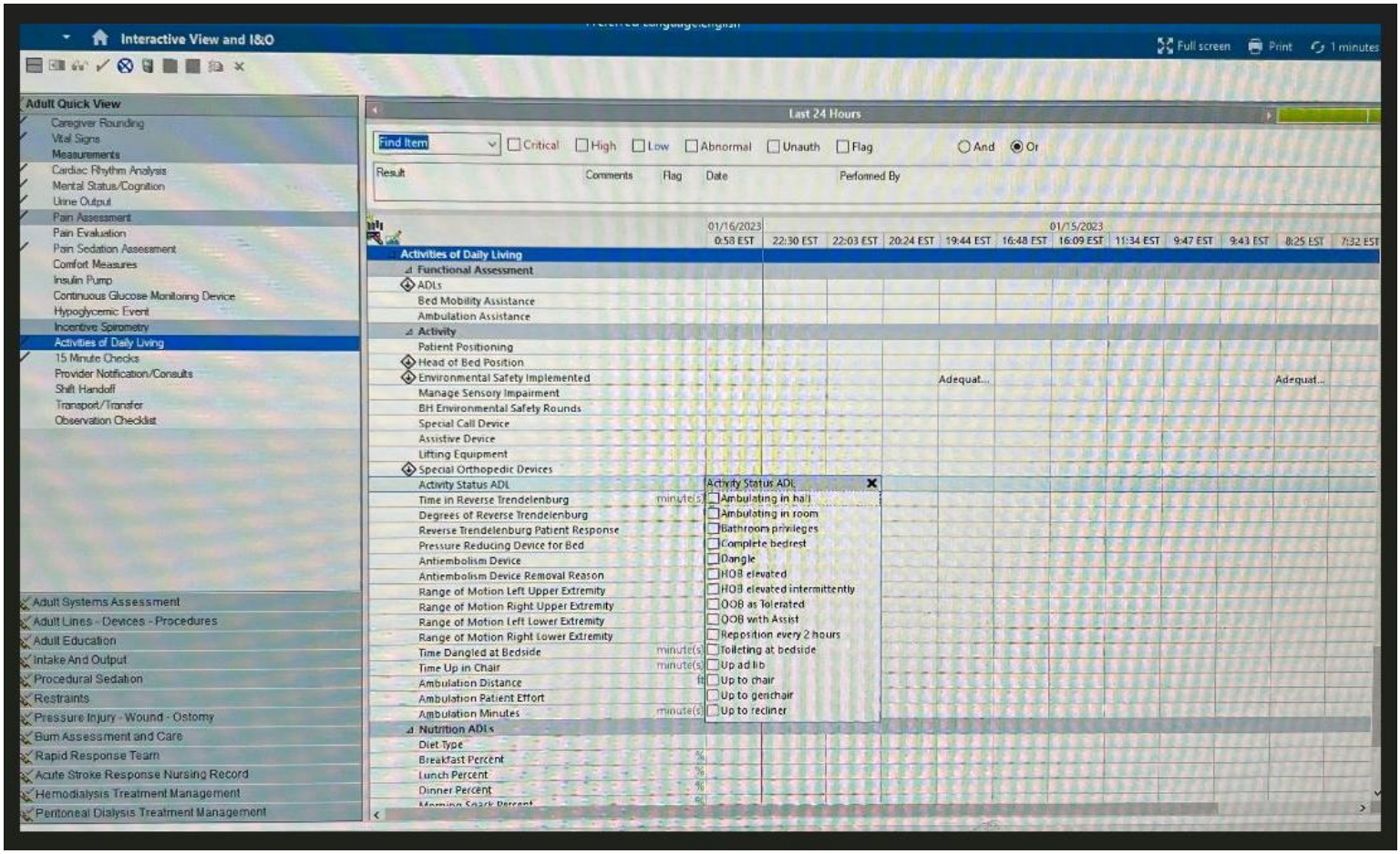
	Preop Day or Office Visit	Day of Surgery	POD #1	POD #2–3	POD #4–5
Cardiovascular	Bilateral BP Height & weight O_2 saturation	Monitor & treat: shivering bleeding arrhythmias hemodynamics Meds (start 8 h postop): aspirin metoprolol	VS q2h Telemetry D/C neck & arterial lines Meds: 2 g MgSO4	VS q4–8h Telemetry	VS before D/C Remove pacing wires
Respiratory	RA O_2 saturation; ABGs if <90% PFTs if COPD	Wean to extubate within 6–8 h IS when awake q1h	40% face mask or nasal cannula IS when awake q1h Splinted cough	Nasal cannula at 2–4 L/min for O_2 sat <95% IS when awake q1h Splinted cough	Room air
Fluids and electrolytes		I & O q1h Keep u/o >1 mL/kg/h	Weight I & O q2h Furosemide IV	Weight I & O qshift Furosemide IV	Weight Furosemide IV/PO until at preop weight
Wounds and drains	Hibiclens shower	OR dressing × 12 h unless Dermabond is used Monitor/manage CT drainage	DSD with betadine wipe to wounds (unless Dermabond used) & pacing wire sites D/C CT when total drainage <100 mL/last 8 h	DSD with betadine wipe to wounds (unless Dermabond used) & pacing wire sites	Wounds open to air
Pain control		Continuous or low dose IV MS bolus NSAID IV acetaminophen	IV → PCA MS IV ketorolac	Oxycodone with acetaminophen Acetaminophen	Oxycodone with acetaminophen Acetaminophen
Nutrition/GI	NPO after MN	NPO NG tube to low suction	D/C NG tube Clear liquids	Advance to hi cal, hi protein, NAS diet ADA for diabetics Metamucil/Colace	Progress on diet
Activity	Ambulatory	OOB to chair × 1 after extubation	OOB to chair q8h Ambulate as tolerated	Ambulate × 3 in room with assist, then in hallway × 4	Ambulate × 6 in hallway; Stair climb 12 stairs × 1

Appendix K

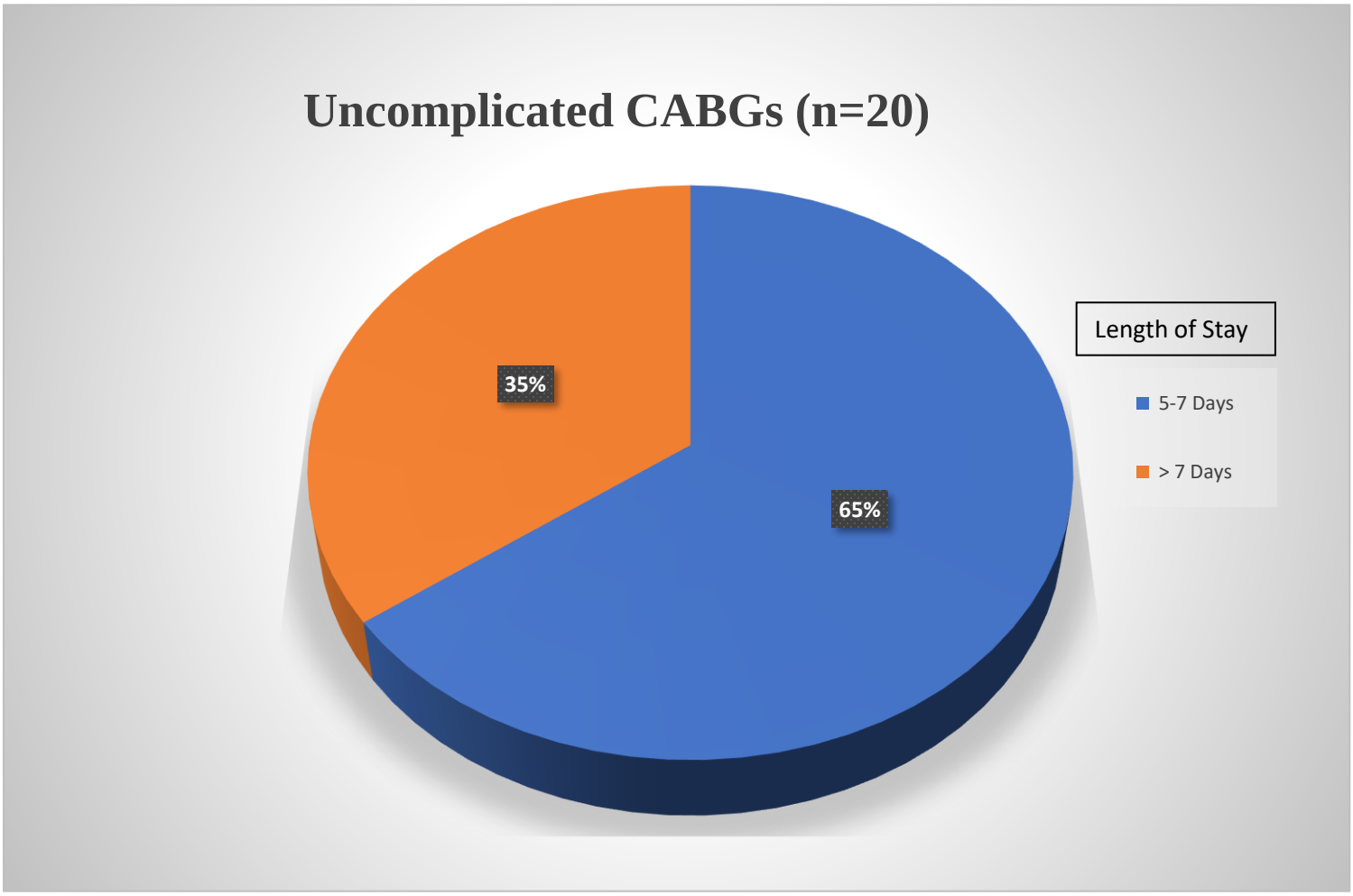
The Role of Inactivity on Cardiovascular Outcomes



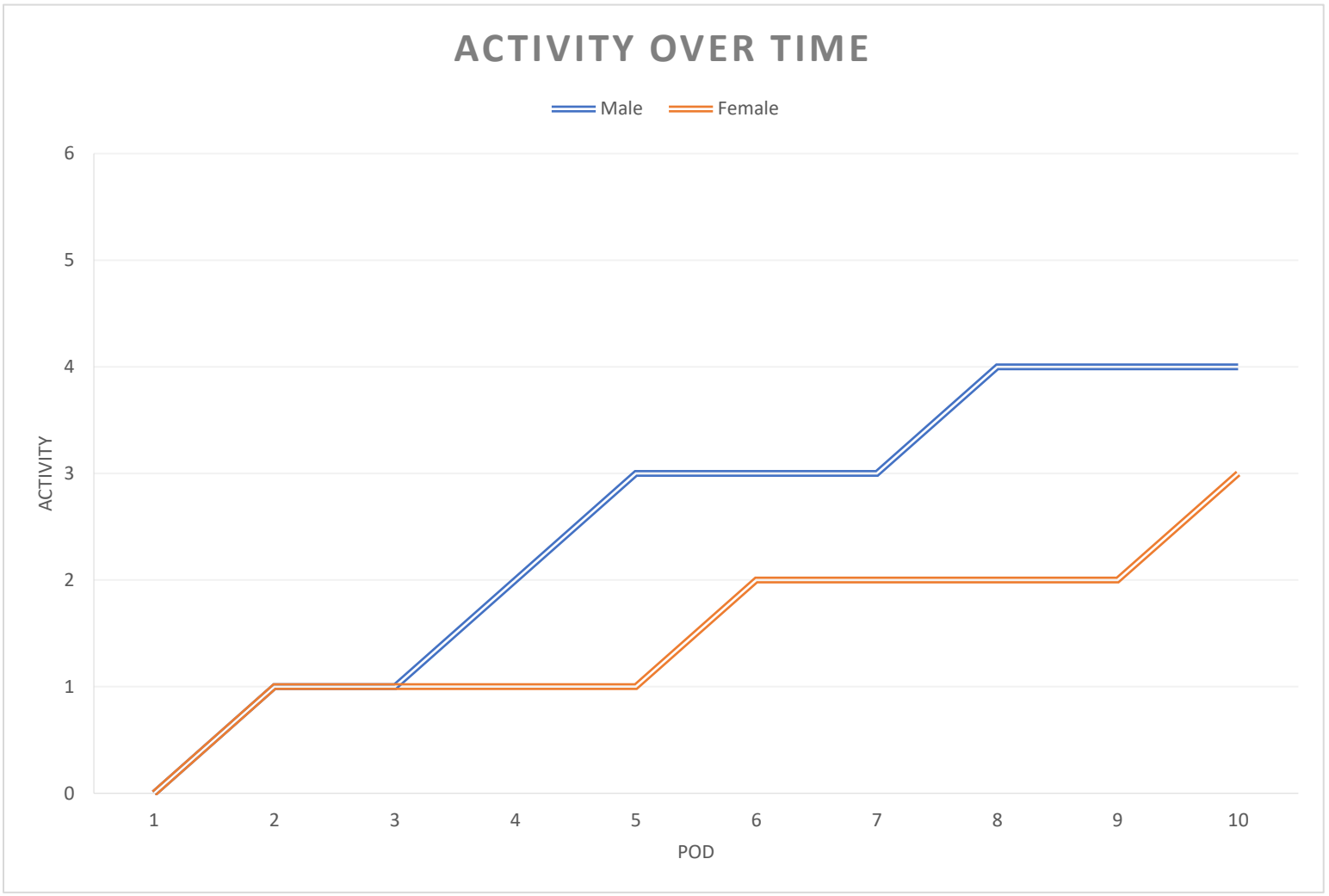
Appendix L


Interactive View and I&O
Full screen
Print
1 minutes
Adult Quick View
Caregiver Rounding
Vital Signs
Measurements
Cardiac Rhythm Analysis
Mental Status/Cognition
Urine Output
Pain Assessment
Pain Evaluation
Pain Sedation Assessment
Comfort Measures
Insulin Pump
Continuous Glucose Monitoring Device
Hypoglycemic Event
Incentive Spirometry
Activities of Daily Living
15 Minute Checks
Provider Notification/Consults
Shift Handoff
Transport/Transfer
Observation Checklist
Adult Systems Assessment
Adult Lines - Devices - Procedures
Adult Education
Intake And Output
Procedural Sedation
Restraints
Pressure Injury - Wound - Ostomy
Burn Assessment and Care
Rapid Response Team
Acute Stroke Response Nursing Record
Hemodialysis Treatment Management
Peritoneal Dialysis Treatment Management
Last 24 Hours
Find Item
Critical
High
Low
Abnormal
Unauth
Flag
And
Or
Result
Comments
Flag
Date
Performed By
01/16/2023
01/15/2023
0:58 EST
22:30 EST
22:03 EST
20:24 EST
19:44 EST
16:48 EST
16:09 EST
11:34 EST
9:47 EST
9:43 EST
8:25 EST
7:32 EST
Activities of Daily Living
Functional Assessment
ADLs
Bed Mobility Assistance
Ambulation Assistance
Activity
Patient Positioning
Head of Bed Position
Environmental Safety Implemented
Adequat...
Adequat...
Manage Sensory Impairment
BH Environmental Safety Rounds
Special Call Device
Assistive Device
Lifting Equipment
Special Orthopedic Devices
Activity Status ADL
Time in Reverse Trendelenburg
minute(s)
Degrees of Reverse Trendelenburg
Reverse Trendelenburg Patient Response
Pressure Reducing Device for Bed
Antiembolism Device
Antiembolism Device Removal Reason
Range of Motion Left Upper Extremity
Range of Motion Right Upper Extremity
Range of Motion Left Lower Extremity
Range of Motion Right Lower Extremity
Time Dangled at Bedside
minute(s)
Time Up in Chair
minute(s)
Ambulation Distance
ft
Ambulation Patient Effort
Ambulation Minutes
minute(s)
Activity Status ADL
Ambulating in hall
Ambulating in room
Bathroom privileges
Complete bedrest
Dangle
HOB elevated
HOB elevated intermittently
OOB as tolerated
OOB with Assist
Reposition every 2 hours
Toileting at bedside
Up ad lib
Up to chair
Up to geichair
Up to recliner
Nutrition ADLs
Diet Type
Breakfast Percent
%
Lunch Percent
%
Dinner Percent
%

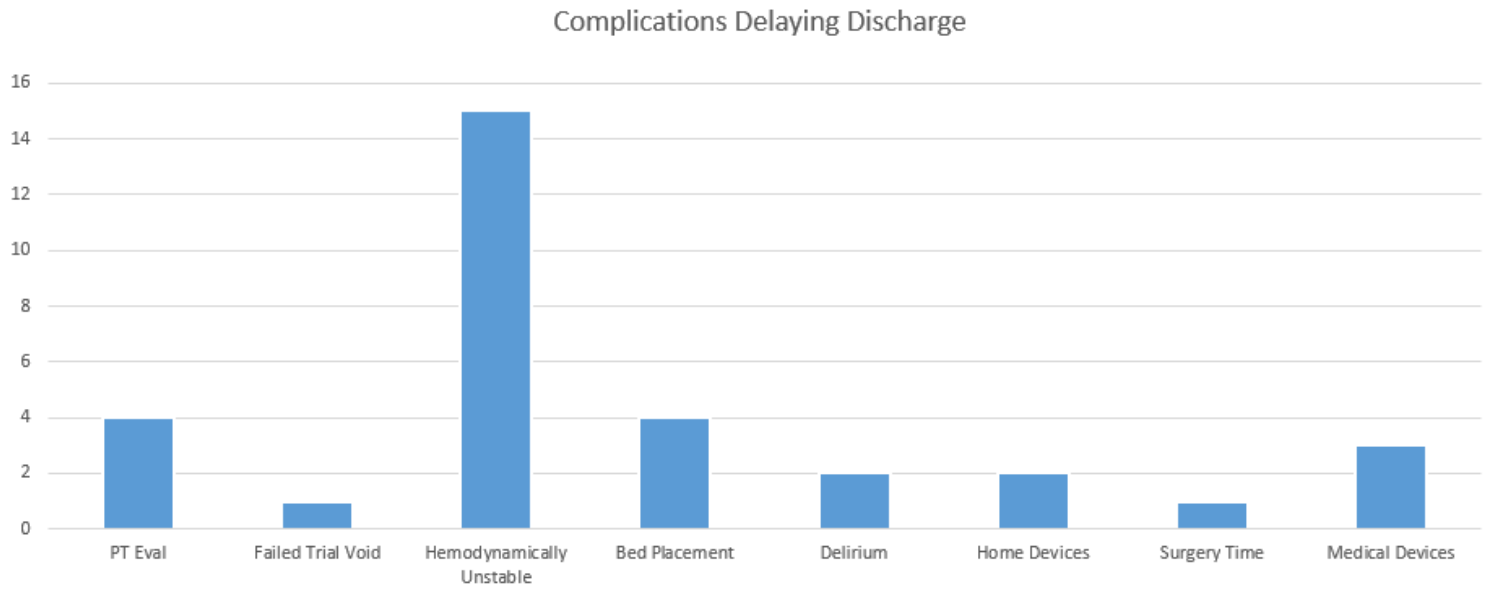
Appendix M



Appendix N


ACTIVITY OVER TIME
Male
Female
ACTIVITY
0
1
2
3
4
5
6
1
2
3
4
5
6
7
8
9
10
POD

Appendix O


Complications Delaying Discharge
16
14
12
10
8
6
4
2
0
PT Eval
Failed Trial Void
Hemodynamically Unstable
Bed Placement
Delirium
Home Devices
Surgery Time
Medical Devices

Appendix P

Taber, Prof. Christopher B.

To: Ryan, Crystal M.

Cc: Alp, Feride F. 'Funda'; Londo, Madeline C.

Wed 4/19/2023 8:49 AM

Dear Applicant,
Thank you for your submission to the IRB requesting exempt review. Based on the application submitted, the IRB is pleased to approve your submission and we wish you great success in your research.

Sincerely,
Christopher Taber
Chair, IRB

Christopher B. Taber, PhD, CSCS*D, USAW3, EP-C, PES
Director, Exercise and Sport Science M.S. Program
Associate Professor
College of Health Professions
Sacred Heart University
(203) 396-6342

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To see where our M.S. alumni are working, click here.

Appendix Q

Executive Summary

Cardiothoracic surgeons support the post-operative process among populations requiring help with activity and ambulation, however, acute care settings need a more aggressive approach on enforcing this process. Physical activity following cardiothoracic surgery can help decrease post-operative complications, expedite functional recovery, improve overall well-being, shorten hospital length of stay (LOS), and reduce morbidity and mortality (Miwa et al., 2017). Studies have shown that nurses infrequently initiate activity or ambulation for their patients and that nurses, doctors, patients, and physical therapists all cite lack of time and dedicated staff as a major barrier to patient mobility (Miwa et al., 2017).

Using the Plan-Do-Study-Act (PDSA) tool from the Institute for Healthcare Improvement (IHI) model helped guide the implementation process. The implementation spanned 10 weeks, from January 16th, 2023, to March 27th, 2023. There were two PDSA cycles lasting five weeks each. Employees were educated on the importance of activity, the evidence-based protocol, and directions on how to document in the EMR. Over the 10-week period, staff compliance increased biweekly as reinforcements were provided via handouts, email, mini huddles, text messaging, and project champions.

Completion of the pilot yielded that 65% of the target population met the goal of discharge by 7 days post-operatively. This project demonstrated the need for activity and ambulation early on for uncomplicated coronary artery bypass patients in the acute care setting. Healthcare organizations want to ensure they are appropriately and efficiently reimbursed for their services, whereas this is beneficial to the provider, it's equally beneficial to the patient because they are discharged sooner, decreasing their length of stay. Thus, this project not only

depicted the return on investment but also raised awareness and informed the staff of expected outcomes of their patient population which will lead to improved patient outcomes.