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Improving Access to Cardiac Catheterization

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Improving Access to Cardiac Catheterization

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This Manuscript Partially Fulfills the Requirements for the Doctor of Nursing Practice Program and is Approved by:

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IMPROVING ACCESS TO CARDIAC CATHETERIZATION

Abstract

Practice Problem:

Cardiovascular disease is responsible for 30.5% of all fatalities in the United States. Delayed access to cardiac catheterization may lead to adverse outcomes such as myocardial infarction (MI), congestive heart failure, or even death during the waiting period.

PICOT:

In patients with a high risk of heart disease (P), how does the creation of a pre-admission holding area (I) to admit external patients directly for cardiac catheterization versus the current waiting process (C) for a confirmed intake bed prevent adverse events (O) within 60 days (T) of physician orders?

Evidence:

Most of the evidence concentrated on enhancing care accessibility through organized capacity planning, improved throughput, and direct admission to the cath lab holding area. This requires advanced real-time communication across multiple systems.

Intervention:

The process change incorporates digital handoff between physicians, transport to the receiving facility, direct admission of external patients to the cath lab holding area, procedure, and stabilization before transfer to the cardiac unit or external transfer back to the home facility.

Outcome:

The goal of this process improvement project was to reduce the wait time for external referral patients to receive cardiac catheterization at the receiving hospital and improve patient outcomes.

Conclusion:

Patients waiting for cardiac catheterizations are at risk of experiencing adverse outcomes, such as irreversible cardiac damage or even death. Prompt interventions can lead to favorable clinical results for these individuals.

Improving Access to Cardiac Catheterization

The American Heart Association lists cardiovascular disease as the underlying cause of death for 874,613 people who lost their lives in 2019 (Tsao et al., 2022). On average, someone in the United States has a myocardial infarction every 40 seconds, and someone dies of a stroke every 3 minutes and 30 seconds. Studies support coronary artery disease as a significant contributor to cardiac arrest in a non-hospital setting (Yannopoulos et al., 2019). The authors provide evidence supporting the importance of early cardiac catheterization. There is a 10-15% survival rate with a higher level of functioning compared to delayed or no access to a cardiac catheterization lab.

Significance of the Practice Problem

Delayed access to cardiac catheterization could result in adverse events like myocardial infarction (MI), congestive heart failure, or death while waiting (Pringle, 2021). Cardiovascular disease (CVD) accounts for 30.5% of all deaths in the United States (Weaver et al., 2022). CVD often presents as coronary artery disease or MI. Some of the critical risk factors for CVD include hypertension, obesity, and diabetes. Additional risk factors include race, socioeconomic, and demographic characteristics.

An ST-elevation myocardial infarction (STEMI) occurs when there is a complete blockage of blood flow to the myocardium, resulting in ischemia. An MI can be STEMI or non-STEMI based on electrocardiogram (EKG) changes (Patel et al., 2019). A medical facility without a cardiac cath lab should determine a process where an external facility can provide access to care that expedites treatment to prevent further cardiac damage. Failure to diagnose or delayed care is a common risk for litigation. Cardiologists in the United States face a higher risk

of litigations at 8.6% versus non-cardiologists at 7.4% (Patel et al., 2019). Early triage and access to cardiac catheterization could result in long-term mortality, lower hospital costs in the long term, and better patient outcomes (Valdovinos et al., 2020).

A large acute care facility in San Francisco has extensive cardiac care services with a robust cardiac cath lab servicing thousands of patients in the northern California region. One of the associate medical centers in Santa Rosa does not have a cardiac cath lab limiting their patient's access to cardiac procedures. Santa Rosa has been traditionally referring patients to San Francisco for cardiac procedures. The referring hospital often waits for bed availability in San Francisco before a patient is cleared for transfer. This urban medical center has been dealing with a high census limiting its capability to intake these patients. Decreased intake availability has resulted in delayed care for these patients putting them at potential risk for adverse events or mortality.

Delayed access to cardiac catheterization puts these patients at risk of complications due to current morbidity and further increased risk of mortality. The process of inter-facility transfers involves extensive multidisciplinary collaboration with a regional transport hub to coordinate transportation between the two locations. During the transportation process, patients are at risk of having complications related to their cardiac risks and could warrant transport redirect to the nearest emergency room.

This project aims to implement a workflow that reduces the wait time for referral patients to be directly admitted to a holding area and proceed to the cath lab, thus eliminating the wait time for a confirmed bed before patient transport from the referring site. It also consists of the need to enhance workflows in Health Connect. The Santa Rosa facility should be able to create a

leave of absence status to preserve crucial physician orders that otherwise get discontinued once the patient leaves the transferring site. Although both medical centers fall under the same corporate umbrella, each facility has designated physicians whose orders do not carry across different medical centers. Order entry in Health Connect is a regional workflow, and there needs to be a policy change enabling inter-facility communication when a patient is being transferred for a procedure.

PICOT Question

In patients with a high risk of heart disease (P), how does the creation of a pre-admission holding area (I) to admit external patients directly for cardiac catheterization versus the current waiting process (C) for a confirmed intake bed prevent adverse events (O) within 60 days (T) of physician orders?

P: The patient population recommended for this project has a high risk of coronary artery disease. The identified patients are either inpatients or outpatients at a referring medical facility without a cardiac cath lab. These patients are referred to an external medical center with a cardiac lab. The goal is to reduce the wait time from the physician placing an order to the patient receiving a cardiac cath at the referral center. Some common reasons for the delays have been the unavailability of department admit beds to begin the transfer process.

I: Cardiac catheterization is a key diagnostic procedure to make appropriate clinical decisions for managing these patients. Providing this procedure in a timely factor is critical in determining the proper clinical management of these patients. The Department of Nursing, in collaboration with the Cardiac Cath team, is working on a process to identify an independent pre-procedure unit to intake these patients directly, eliminating the need for beds to be available before a patient can be

transferred for the procedure. The process will also look at discharging these patients back to the home facility if they are stable post-procedure. The process involves creating a cardiac workflow hall pass to coordinate transfers from Santa Rosa to San Francisco and return patients to Santa Rosa once stabilized post-procedure.

C: The current practice is to wait for clearance from San Francisco as Santa Rosa, the referring hospital, does not have a cath lab, where the patients are put on a wait list awaiting access. This access depends on the availability of beds, physicians, and transport to the receiving hospital. The current wait time can be anywhere from 10-14 days depending on bed capacity at this busy urban facility in San Francisco. The comparison is to eliminate long wait times for patients to receive access to the procedure reducing the risk of morbidity and mortality within this population.

O: Patients awaiting cardiac catheterization may experience adverse events and irreversible damage from congestive heart failure or myocardial infarction. There is also a higher risk of mortality amongst this population. The quality team will gather process and outcome measures to verify the impact of the intervention on the health status and patient experience through the process.

T: The goal is to analyze the effect of reducing wait times for patients with high cardiac risk from when the physician makes a referral to the patient obtaining the procedure at a receiving facility. Initially, the project will aim to accommodate patients from an identified medical center, and we have a target review period of 90 days from the project launch to reanalyze how many patients can be accommodated and the time it takes from referral to procedure.

Theoretical Framework

Evidence-based practice (EBP) is a critical component of high-reliability organizations, and healthcare professionals can make evidence-based decisions at all levels in a clinical environment (Dang et al., 2022). Authors Dang et al. (2022) also discuss the importance of EBP as a requirement for regulatory compliance, health insurance, and sustenance and improvement of professional standards of a healthcare entity.

The Johns Hopkins Evidence-Based Practice (JHEBP) Model for Nurses and Healthcare Professionals uses three components inquiry, practice, and learning, all interdependent. The model also uses a simple three-step process (Appendix A): practice question, evidence, and translation (Johns Hopkins University, 2022). The JHNEP promotes using the latest research findings and best practices for appropriate medical care. Evidence-based research is submitted to a professional practice council, where facilitators disseminate the information and evaluate how this evidence can be translated into practice (Dang et al., 2022). Nurse leaders play a critical role in promoting EBP in clinical practice in the organization. EBP is a cornerstone of Magnet designation, recognizing nursing excellence, quality patient care, and innovation in professional nursing practice (Duff et al., 2020).

When an EBP model is selected, it is essential to analyze the feasibility of the model with the organization's core values, practice needs of staff, and availability of resources, both internal and external (Johnson et al., 2023). For this project, Lippitt's Seven-Step Change Theory has been selected, which includes:

- Diagnose Problem: Delaying cardiac catheterizations due to the unavailability of admitting beds increases the risk for external referral patients.

- Assess motivation and capacity for change: Infrastructure and space availability were analyzed, and a holding area to intake external admissions was determined for the project. Analyze if there exists a shared agreement amongst stakeholders regarding the root of the problem and how a change can alleviate the care gap.
- Assess the change agent: As a project in charge, is the team cooperative and willing to work with me as a change agent? The charge nurse and navigator are highly motivated to incorporate the workflow and admit patients into a holding area for the procedure. The house supervisor is informed once the patient arrives and will confirm a bed for patient transfer once the procedure is complete.
- Select progressive change objectives: A clear workflow has been created to train staff and stakeholders. The goal is to reduce the wait time for a patient to come directly to the cath lab bypassing the wait for a direct admit bed.
- Transforming intentions to change: All stakeholders are trained in the workflow and will communicate using an internal pager system to coordinate patient movement through the workflow. For after-hours transport, unit nurses have been educated to call the regional transport hub for the patient to transfer back to the referring facility. The progress will be monitored through the next quarter.
- Choose the appropriate change agent role: Verify the change process with all parties involved. Have daily huddles to analyze any gaps and coordinate workflow.
- Maintain change: Facilitate feedback, enhance communication, and coordinate change effects.

- Terminate helping relationships: Once the change process is running efficiently, step out of the process and allow the department to champion workflow.

Lippitt's Seven-Step Change Theory is more detailed and clarifies the process at every step. A clearly defined outcome enables the department to incorporate a change more efficiently and attain results to offer optimal patient care and organizational goals (Dang et al., 2022).

Evidence Search Strategy

The literature search is a critical part of implementing an EBP change. The literature search consists of four parts: identify the concept using keywords, synonyms, and relevant vocabulary; selecting relevant library resources like journal databases; using Boolean words like and, or to limit search; and reviewing and refining research to determine literature to strengthen the necessity and support the study.

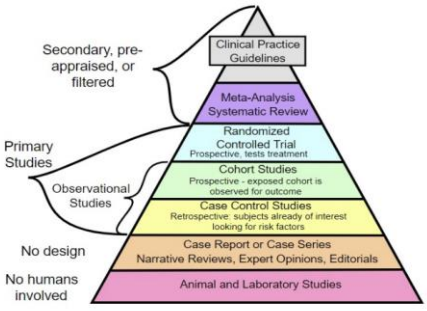
A comprehensive review of databases was conducted to find evidence to support the importance of timely cardiac catheterization procedures in a high-risk population with cardiac diseases. The databases used were EBSCO Host, CINAHL Complete, Medline, Google Scholar, and Open Dissertations. Combining specific keywords and identifiers with Boolean words "or" increased the probability of finding search results significant to the PICO question. For the initial search, keywords used included heart disease, time, cardiac catheterization, capacity planning, risk factors, outcomes, and delayed care. The Boolean word "and" was used to narrow the search but did not give enough results to study. The search criteria also used Medical Subject Headings (MeSH) vocabulary like adverse effects, contraindications, and quality of life. The initial search was limited to 5 years which was later expanded to 15 years as there were more relevant articles

from earlier years. Several attempts to filter, mix, and match keywords provided satisfactory results to support the PICO question.

CINAHL and EBSCO host produced 259 results, with many duplicates eliminated. Google Scholar also provided 25 articles closely associated with the researched topic. The inclusion criteria for this search were adult patients identified with high-risk cardiac diseases. Exclusion criteria included pregnant women, children, and the stable to be transferred to an external location. Using the inclusion criteria and specific keywords, 20 articles that closely supported the PICOT question requirements were available. Articles published in 2023, 2022, 2021, 2020, and 2007 have been selected for this paper (Appendix B, C, and D).

Evidence Search Results

Several stages were involved specific to literature searching in systematic reviews. The methods used were literature search, the purpose of the focus of the literature being searched, preparation, the search strategy, searching varied databases, using supplementary search methods, managing references, and organizing the search process. During the identification of search results, using a hierarchy of evidence helps identify the types of research that will provide evidence to support the PICOT question.



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Once evidence tables were created, the next step involved analyzing the strength of the evidence. During the search, CINAHL and EBSCO host produced 259 results, with many duplicates eliminated. Google Scholar also provided 25 articles closely associated with the researched topic. According to the Agency for Healthcare Research and Quality (AHRQ), evidential strength includes three elements: quality, quantity, and consistency (Glasofer & Townsend, 2019). The articles were eliminated to include the top 20 that met the criteria, using critical keywords, level of evidence, and the strength of evidence provided. Furthermore, the 10 most relevant articles were further reviewed and used for the study **(**Haddaway et al., 2022). PRISMA diagram included (Appendix E). The evidence search results focused on capacity planning, throughput enhancement, identifying techniques to direct admit for procedure, and real-time communication.

AHRQ states that the goal of evidence assessments is clearly explained so that decision-makers can use the process effectively. The Johns Hopkins Nursing level and quality guide provides a detailed narrative on performing quality ratings of the evidence selected. Based on the Johns Hopkins Medicine (2021) guidelines, the selected studies were graded based on quality and evidence level (Appendix F).

Themes with Practice Recommendations

The outcome of the PICOT question is preventing adverse effects due to delayed cardiac catheterizations. Once the table was created, an inductive approach was used to determine the themes. After reviewing all the data in the articles, the three most significant themes related to the outcome are delayed care, management of outpatient access, and capacity planning using EBP (Appendix G).

The American Heart Association, along with the National Institute of Sciences, annually reports statistics related to heart disease, stroke, and cardiovascular risks (Tsao et al., 2022). The Centers for Disease Control and Prevention (CDC, 2022) reports that heart disease is the leading cause of death for men, women, and people of most racial and ethnic groups in the United States. One person dies every 34 seconds in the United States from cardiovascular disease. Yannopoulos et al. (2019) describe the need for early interventions like cardiac catheterizations.

The first theme of delayed care closely relates to the articles selected for the study. Blankenship et al. (2021), Pringle (2021), Valdovinos et al. (2020), Yannopoulos et al. (2019), and Gupta et al. (2007) discuss common ideas: delayed access to care, the need for capacity planning to ensure timely cardiac catheterizations, equitable access to care, delay in care due to weekends and holidays, and the need to support outpatients in receiving timely care by promoting the role and timing of diagnostic and interventional procedures for high-risk cardiac patients. The articles highlight the importance of timely diagnosis and interventions to prevent adverse effects on patients awaiting treatment or higher-level diagnostic procedures for their condition. As Pringle (2021) states, "Delayed heart treatment is not only distressing for patients, but it can also mean they become more unwell or even die on the waiting list."

The second theme is the management of outpatient access. Here the focus is on two main categories: access to cardiac catheterizations and EBP to reduce wait times for patients at an outpatient location. A significant aspect of providing care is optimizing access to outpatients who may not have immediate access to diagnostic procedures. These patients may have a higher risk due to comorbidities or a high-risk cardiac disease but may have to wait for availability in a hospital with a cardiac cath lab. In such cases, as discussed by Blankenship et al. (2021), Pringle

(2021), and Patel et al. (2019), delayed care can contribute to adverse effects for the patient. For optimal care, there is a need for a collaborative process with facilities with cardiac cath labs to ensure timely access to life-saving cardiac catheterization processes.

In this paper, the facilities are medical centers under one of the largest non-profit healthcare organizations. Interfacility collaboration and transfer of healthcare information are optimal under these circumstances as all medical centers follow guidelines, policies, and systems unique to the organization. However, suppose patients belong to an external organization. In that case, the process will require an accepting physician to collaborate with an external entity and case managers or social workers to initiate the transfer, process documentation, and support patient and family concerns specific to the case. Along with tangible costs, patients must consider insurance coverage to determine if the hospital and physician are covered under their network to avoid any surprises.

The third theme focuses on capacity planning. Yannopoulos et al. (2019) and Gupta et al. (2007) discuss how capacity planning and time optimization play a critical role in providing timely care and preventing wait times and adverse outcomes in patients with a high-risk cardiac diagnosis. While outpatient medical centers may not have cardiac cath labs, these facilities must collaborate with hospitals that can provide timely access to these patients awaiting these procedures. The common delays for intake hospitals are related to their available bed capacity which determines when an external patient can be admitted for a procedure. For a busy medical center, common barriers to bed availability are related to throughput where capacity planning and bed management play a critical role in enhancing patient admittance (Institute for healthcare improvement., n.d.).

While the themes are diverse, all three themes of delayed care, management of outpatient access, and capacity planning focus on practice recommendations to prevent adverse outcomes for patients requiring cardiac catheterizations. The importance of EBP in the adoption and implementation of practice is based on a culture of inquiry that is part of a continuous quality improvement mindset. Grys (2022) discusses how nurse leaders implementing evidence-based processes should engage all stakeholders to understand the operational and logistical aspects of practice that improve patient outcomes, elevate the quality of care, and reduce cost. Johnson et al. (2023), Duff et al. (2020), and Dang et al. (2022) discuss the same concept of EBP as explained by Grys (2022). The Institute for Healthcare Improvement (n.d.) recommends real-time demand analysis and capacity planning to reduce bottlenecks, improve workflow, and enhance patient experience. All these authors highlight the importance of using an EBP model to implement change in a complex healthcare environment.

Settings, Stakeholders, and System Change

The organization is one of America's leading healthcare providers and non-profit health plans, serving 12.6 million members. The organization has a substantial presence in eight states and the District of Columbia. Its headquarters in California has a vast presence covering 11 regions in Northern California and 9 regions in Southern California. The faacility has a highly distinguished cardiovascular thoracic center, the most extensive cardiac surgery program in the San Francisco Bay Area, and the largest in California. The Cardiac Catheterization Laboratory (Cath Lab) provides a variety of cardiac diagnostic and treatment procedures. This department is operated by an esteemed team of Board-Certified Cardiologists, specialty trained Registered

Nurses, Invasive Cardiovascular Specialists, and Cardiovascular Technicians committed to providing the highest quality care to patients and their families.

The organization is driven by its mission to provide high-quality, affordable healthcare services and improve the health of its members and their communities. Being in an urban location, the medical center has space limitations that limit comprehensive expansion programs. However, the medical center has always been the region's top entity delivering care in innovative fashions within its space limitations. Recently, there have been various discussions around enhancing the admission, discharge, and transfer process to optimize capacity planning. The bed management team plays a crucial role in identifying the real-time needs of departments and coordinating the transfer of patients in a timely and safe manner. The Santa Rosa facility, also in the Northern California region and just over an hour away from San Francisco, does not have a cardiac cath lab. During an interfacility conversation between the cardiac chiefs, the Santa Rosa cardiac chief voiced concerns regarding delays for patients awaiting cardiac catheterization procedures. Without hesitation, the San Francisco Cardiac chief involved stakeholders in brainstorming a process to provide care to these patients. This involved bringing critical stakeholders to the table to discuss an interfacility collaboration.

Patient Reported Outcomes are an essential quality tool to measure patient-focused care and its outcomes (Sawatzky et al., 2021). A patient reports an outcome at the micro level, which affects the healthcare organization at the meso level. Any changes to improve, expand, or modify care require policy review at the macro level, which is guided by organizational bylaws. Implementing an interfacility collaborative practice change requires critical stakeholders like the Chief Nursing Officer, the Associate Medical Group administrator, the Assistant Director of

Nursing and Clinical Practice, the Quality leader, the Cardiac Chief physician, and the Cardiac service line director to agree, analyze, and determine threats for this EBP project implementation (Appendix H). Leaders impact organizational and system changes by using compelling data and benchmark comparisons to evaluate the necessity for the change theory. Doctoral-prepared nurse leaders can assess change readiness, identify potential barriers, and strategize and promote the long-term sustainability of EBP projects (Tucker & Melnyk, 2019).

To herd stakeholders together and discuss an EBP implementation, a business strategy tool like SWOT (short for strengths, weaknesses, opportunities, threats) analysis can be vital to assess an organization to its competitors. Appendix I shows the major contributing strengths and weaknesses: internal factors, opportunities which are the external factor that can be beneficial to the entity, and threats that could hinder a successful change management implementation. Early identification and collection of data help strategize the process and align measures to integrate changes promptly (Teoli et al., 2022).

Implementation Plan

An implementation plan is a strategic method to accomplish goals within a team, a department, or an organization. The CDC (2022) recommends creating a community of practice defined as a group of people who share the same interests, concerns, and are passionate about addressing issues through a shared practice of experiences, analysis, and innovation to deliver care by maximizing resources. Once the group has determined the goal, it is critical to understand the objectives and activities needed to achieve these goals. In healthcare, SMART (Specific, Measurable, Achievable, Relevant, Timely) goals are identified to enable the team to improve performance and optimize patient care (Appendix J). Every aspect, from personnel,

deliverables, systems, and funding must be identified to execute the objectives outlined in the SMART goal. The Harvard Business Review states that implementation planning heightens project success (Favaro, 2015).

The implementation plan consists of the following steps based on Lippitt's Seven-Step Change Theory framework chosen for this project. (Appendix K: GNATT Chart enclosed). The GNATT describes the responsibility of stakeholders with timelines for the project. The timeline of the project will include three phases:

1. Initialization: which will include stakeholder buy in, inter facility process discussion, transport setup, stakeholders engagement with bed management and capacity planning, nursing staff, admission and scheduling staff, cardiac floor nurses, and cath lab staff.
2. Improvement: the team will pilot the process, implement solutions, continue to brainstorm to enhance processes, and collect data to confirm measurable progress. Having a structured process helps to identify the baseline, any potential barriers, and strategies to eliminate the barriers to enhance patient care.
3. Control: during this phase, the team will ensure that the process is carefully managed and monitored with clear documentation. Having a well-documented process enables future opportunities to transfer innovations and knowledge to other departments or medical centers.

The project timeline is 30 days from initialization to control. Data will be analyzed 90 days post first patient transfer to analyze data related to physician communication and patient referral, patient acceptance, and scheduling by cath lab team, external transport time to receiving facility

with any identifiable delays, time from cath lab admission process to procedure, and finally patient transfer to cardiac floor.

Diagnose Problem:

- Goals and Objectives: Defined in the SMART goals. The SMART goals help us understand the need for this project and the desired outcomes.
- Scheduled Milestones: The project was allocated three months, from conceptualization to implementation. This was based on ongoing conversations about this process over the last year, during which some interim research and data collection was conducted to support the need for this project.

Assess capacity for change:

- Allocate Resources: The process will involve direct admission of the external referral to the cath lab holding area. There will be no additional requirements for resources or funding within the cath lab for this project. Apart from enhancing the use of the holding area, other resources required for the project include transportation, a house supervisor to ensure a post-procedure bed for admission to the cardiac floor, information technology support to test and ensure inter-facility communication and transfer of relevant orders, nurse-to-nurse and physician to physician handoff procedures, and external facility to cath lab admission bookings.

Assess the change agent:

- Adaptation and Change Management: Education and staff acceptance of the project is critical to enabling this multi-level multi-facility project. To ensure success, leaders must encourage open discussions to establish an understanding of the process. Another

essential aspect to consider is external factors that could alter the planning and execution of the process. Such considerations could be due to transportation delays, change in patient status from transferring facility, or unavailability of cath lab schedule at receiving facility. Having backup plans that are flexible and agile will make the process smoother in the department and more accepted by staff.

Select progressive change objectives:

- Review impact analysis to determine if the external admissions process will impact internal workflows and transfers for existing patients and departments.
- Review cost-benefit analysis to determine if more patients are being accommodated within set budgets.

Implementation and monitoring:

- The implementation process will include:
    - direct admission of transfer patients to the cath lab holding area for initial assessment, consent, and preparation for the procedure.
    - Following completion of the admission process, the patient will be taken to the cath lab for the procedure.
    - Post procedure, the patient will be in cath lab recovery and will be transferred to a cardiac floor when ready.
    - The cardiac bed request is initiated with bed management as soon as a patient transfer from an external facility is confirmed.
    - The goal is for the house supervisor in charge of bed management to confirm bed allocation before the patient is out of the procedure. This will enable the cath lab

recovery nurse to facilitate the discharge and transfer process once the patient has met recovery criteria.

    - Time management and throughput are significant components as the cath lab holding area is limited to two patients and serves as both pre and post procedure patient hold area.

- Initiate change process, make necessary revisions as process demands, evaluate milestone success and issues, finalize the process, and report data.
- Identify Metrics for Success: The data analyst will generate a monthly report from implementation to analyze the process. The number of patients being directly admitted and the time from referral to admittance and discharge will be tracked via the report.
- To comply with the HIPAA Security Rule (Centers for Disease Control and Prevention, 2022), measures will be in place to:
    - Ensure the confidentiality, integrity, and availability of all e-PHI during the transfer process.
    - Detect and safeguard any anticipated threats during transportation.
    - Certify compliance by workforce involved.

Result assessment and termination helping relationships:

- Once the project has been in operation for 90 days since launch, evaluate data to assess change results, evaluate the scope for expansion and process improvements, compile a report of findings, communicate the report to key stakeholders, and terminate the relationship for the department to champion the process.

Budget: Although the project does not require additional budgeting for space, equipment, or technology, staffing is a critical aspect of this project. For each element of the project, staffing is budgeted from scheduling, direct admission, procedure, and post-implementation evaluation by a nurse practitioner (Appendix L).

Results

The final stages of the project implementation consisted of evaluating potential gaps, tracking early progress, and providing opportunities to enhance processes. During this phase, the goal was to assess data to analyze if project goals were met, identify successes and failures, and generate data for future analysis. Data analysis is a critical communication tool to disseminate the program's impact. Numbers and statistics offer quantifiable results, making it easier for stakeholders to understand and compare the program's outcomes.

Over a three-month period, an analysis was conducted specifically on external referrals. The emphasis was on investigating the time elapsed between discharge from external referrals and the subsequent transfer to the San Francisco Medical Center. The primary objective was to evaluate the impact of implementing direct admissions on reducing waiting times for cardiac catheterization. The data collected (refer to Data Analysis – Cardiac Cath Lab External Referral - Appendix M) provides evidence that an optimal time range has been consistently maintained, with patients arriving at the medical center and receiving the procedure within an average of less than 2 hours from admission.

While the process enhances the chances for external patients to undergo the necessary medical intervention, certain external factors exist that are outside the control of the receiving facility, thereby elevating the risk of delays. Chief among these factors is the potential for

transport delays, primarily contingent on various ambulance companies capable of offering on-demand Advanced Cardiac Life Support (ACLS) transport. Additionally, it was noted that some patients were critically unstable and required intricate care, necessitating admission to an Intensive Care Unit (ICU) before being eligible for the procedure. This, in turn, depended on the availability of ICU beds before the referral could be accepted.

A secondary tool used was the collection of patient responses via surveys which is a valuable tool for healthcare organizations to monitor and enhance the quality of care they deliver, improve patient experiences, and ensure the ongoing success of their operations. The survey created to assess the referral process and the patient's experience was provided to the patient during discharge (Appendix P). These surveys are part of an ongoing quality survey which is used to measure the quality of service provided at the organization. Such quality measures also provide a way to compare performance metrics in comparison to other area hospitals and regional health plans. The Centers for Medicare & Medicaid Services (2023) highlights the importance of safety and accelerating interoperability to enhance patient outcomes as two of the four main quality strategy goals. Interoperability helps communication between the two medical systems to communicate patient status and transfer requirements in a timely manner using a high-level digital and data-driven health system. The CMS National Quality Strategy aims to improve quality and health outcomes across the care journey. Utilizing advanced data analytics helps policymakers make informed decisions. These recommendations should be aimed at improving the quality of care, reducing costs, and enhancing patient outcomes.

The University of St. Augustine's of Health Sciences (USAHA) approval process for the implementation of an evidence-based practice system-change project requires the project

proposal for the DNP Scholarly Project to be approved by a two-step process. The first approval is by the EBP Project Review Council (EPRC) at USAHS. The EPRC approval was followed by the submission of the approved documents and the project plan to the medical organization's Research Determination Office (RDO) which is ancillary to the Institutional Review Board and is used to make determinations on projects that may not meet the definition of research involving human subjects. Once approval was received from the organization, the process improvement project was cleared for implementation.

Impact

The clinical significance of a practice change involves a holistic assessment of its impact on patient care, considering factors beyond statistical significance. It prioritizes patient well-being, safety, preferences, and overall quality of care, recognizing that some changes may be meaningful even if they do not result in statistically significant differences. The goal of this process improvement project was to reduce the wait time for external referral patients to receive cardiac catheterization at the receiving hospital. The key points to improve patient outcomes required system performance updates, a multidisciplinary approach, and the use of a systemic change method between two medical centers (Backhouse & Ogunlayi, 2020). Some key points to understand the impact of the process improvement included:

- Patient-Centered Care: Clinical significance focused on the impact of the intervention or practice change on an individual patient's health and well-being.
- Safety and Risk-Benefit Assessment: Although it is early in the practice change phase and may not show a huge statistical improvement in outcomes, it is still clinically

significant as it enhances patient safety and reduces risks associated with a patient awaiting a cardiac catheterization.

- Cost-Effectiveness: Evaluating the clinical significance of a practice change includes considering its cost-effectiveness. As the change results in better outcomes for patients without significantly increasing costs, it is considered clinically significant.

Sustainability in healthcare practices requires ongoing vigilance, adaptation, and a commitment to maintaining high standards of care. Regularly reviewing and addressing concerns and implications can help ensure that the altered practice continues to benefit patients and the healthcare system in the long term (Lennox et al., 2020). Some key considerations were evaluated to determine the sustainability of this process change which included:

- Workflow Integration: The altered practice was seamlessly integrated into the existing workflows and processes. Any bottlenecks or disruptions were identified that would arise during implementation and plans were made to mitigate them.
- Quality and Safety: A continuous monitoring system was in place to check the quality and safety of the altered practice. Feedback mechanisms and reporting systems were implemented to identify and address any adverse events or safety concerns promptly.
- Regulatory and Compliance Issues: The quality team monitored relevant regulations, standards, and guidelines that may impact the altered practice and patient care.
- Training and Education: Ongoing training and education were provided for healthcare professionals involved in the altered practice. It was critical to stay updated on best practices and emerging research to ensure that the practice remains evidence based.

- Adaptation and Flexibility: The team was prepared to adapt the altered practice as needed based on feedback, changing patient needs, advances in technology, or shifts in healthcare priorities. Flexibility is essential for long-term sustainability.
- Stakeholder Engagement: There was constant engagement with the healthcare teams, patients, and relevant stakeholders to gather input and support for the altered practice. Building a strong network of support highly contributes to sustainability.
- Long-Term Planning: It is critical to develop a long-term strategic plan for the altered practice, considering its evolution and growth over time. Long-term planning should include practices that align with the organization's overall mission and goals.

When the project completes the change management process and integrates into the system, a robust data collection and analysis process can help identify areas for improvement and support sustainability. The department analysts collect data and documentation processes to maintain accurate and comprehensive documentation of the altered practice's outcomes, processes, and patient records. This data is continuously used to measure and evaluate the outcomes of the altered practice by looking for opportunities to refine and improve the practice based on data-driven insights. This was a pilot project which did not need huge funding or major realignments within the department. However, being a city hospital in San Francisco has limitations and an expansion of this project to accommodate more referrals will face critical space challenges in the future.

Dissemination

Dissemination of evidence-based practice (EBP) initiatives is critical in implementing an evidence-based project (Beckett et al., 2021). A poster presentation is a powerful visual tool to

disseminate information about learnings to improve processes and outcomes in a healthcare organization. The poster relays the project's story with clear headings identifying the EBP methodology and engaging reviewers to stimulate further conversations (Evidence-Based Poster Presentation Template - Appendix Q).

Along with poster presentations within the organization, project dissemination to SOAR@USA provides a platform for peer review within the university community and makes the work discoverable with opportunities for wider dissemination through open access. The submission process to SOAR@USA requires submission of the approved paper to the platform which identifies the paper under student research, captures key MeSH terms, and identifies the date of project approval, IRB review process completion, degree name, and advisor. Once approved, the paper will be published under open access.

Additionally, there is an opportunity to present an oral poster presentation at the Alpha Alpha Alpha Chapter of Sigma Theta Tau, where one of the main conference goals is to translate evidence-based strategies into solutions. The goal is to provide expanded outreach and discussion about the EBP project to enable replication for process improvement.

Conclusion

Coronary artery disease is linked to 80% of sudden cardiac deaths (Cleveland Clinic, 2022). The condition may be asymptomatic until a person suffers a heart attack. With over 18 million adults estimated to have CAD in the United States, physicians analyze risk factors to recommend processes like cardiac catheterizations, which is considered a gold standard for diagnosing CAD (Cleveland Clinic, 2022).

Patients awaiting cardiac catheterizations may sustain adverse outcomes like irreversible cardiac damage or death. Timely interventions could provide positive clinical outcomes for these patients. This paper examines how creating a holding area to direct admit patients awaiting cardiac catheterizations from an external referral could reduce wait times and improve access to care. The EBP project intends to provide a benchmark to measure the effect of increased capacity and prioritization of high-risk patients. While capacity planning and space expansions are complex issues in urban settings, utilizing an available clinical area, and strategizing patient transfer and communication between facilities, provide an opportunity to manage external referrals in a timely and safe manner. Our method is portable and could be used in similar settings. However, the needs identified, and modifications made are unique to the cardiac center identified in this EBP.

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Johns Hopkins Nursing Evidenced-Based Practice Model – PET Process - Appendix A

Search Strategy (Appendix B, C, D)

Appendix B: Summary of Primary Research Evidence							
Author/Year	**Title/Design**	**Type of Evidence**	**Population Size/Setting**	**Analysis**	**Findings**	**Level of Evidence**	**Conclusion**
Weaver et al., 2022	Associations between neighborhood socioeconomic cluster and hypertension, diabetes, myocardial infarction, and coronary artery disease within a cohort of cardiac catheterization patients	Ward's Hierarchical clustering to study patient based in different socioeconomic groups, odds of cardiovascular disease, cardiac catheterization outcomes	Adults: Whites, Blacks, and American Indians	History of hypertension, diabetes, obesity, smoking	Greater odds of cardiovascular disease and need for cardiac catheterization amongst suburban versus urban population	Level 4 Cohort Study	Notable differences in the prevalence of hypertension, diabetes, severe CAD, and MI by neighborhood cluster among cardiac catheterization patients
Patel et al. 2019	A Qualitative Analysis of Malpractice Litigation in Cardiology Using Case Summaries Through a National Legal Database Analysis	Impact how physicians approach and evaluate potential diagnoses	Patients with cardiac diseases	Failure to diagnose as a reason for litigation, myocardial infarction was the most missed diagnosis.	Delayed diagnosis/care of patients with coronary artery disease with higher morbidity or mortality results	Level 4	Attention to early cardiovascular diagnosis has the potential to improve patient outcomes, decrease the burden of medical malpractice claims, and optimize the allocation of healthcare dollars.

Appendix C: Systematic Review							
Author/Year	**Title/Design**	**Type of Evidence**	**Population Size/Setting**	**Analysis**	**Findings**	**Level of Evidence**	**Conclusion**
Johnson et al. 2023	Nurse-driven professional practice model: Creating a unified roadmap to guide practice	Qualitative, interpretive descriptive method	Variation of nurses	The EHR seen as a valuable tool for implementing evidence into practice using evidence-based order sets, practice alerts, nursing documentation, and flow sheets.	Shared governance and the significance of nurses driving EBP	Level 6	EBP is most effective in a supportive practice environment
Blankenship et al., 2021	Outcomes of patients undergoing cardiac catheterization after a three-day holiday weekend versus a two-day weekend	Independent t-tests (continuous data) and Chi-square (categorical data) analysis	13,704 patients who had procedures	Study of practice pattern in a 2 day versus 3-day delay for cardiac catheterization procedures	Compared with procedures performed after a 2-day weekend, those following a 3-day weekend were more likely to result in cardiac arrest and were more likely to be associated with any complications	Level 4	Hypothesized that the acuity of patients awaiting catheterization after a 3-day weekend might be higher
Duff et al. 2020	Determinants of an evidence-based practice environment: an interpretive description.	IOWA model and focus on frontline EBP nursing model	12 nurses with different experiences	Subjective perspectives and experiences of nurses using the Iowa Model to optimize EBP	EBP projects are a vital source of documentation for external benchmarking, accreditation, and award nominations.	Level 6	Most positive predictor of evidence use was a nurse's previous participation in EBP activities
Valdovinos et al. 2020	The association of Medicaid expansion and racial/ethnic inequities in access, treatment, and outcomes for patients with acute myocardial infarction	Quasi experimental study	All patients ages 18-64 who had a primary diagnosis of acute myocardial infection	Analysis of non-Hispanic white and minority patients with acute myocardial infarction in California and Florida	Persistent racial disparities in treatment and outcomes after AMI even among individuals with the same type of insurance.	Level 3	Medicaid expansion was associated with a decrease in racial disparities in both likelihood of transfer for patients with acute MI

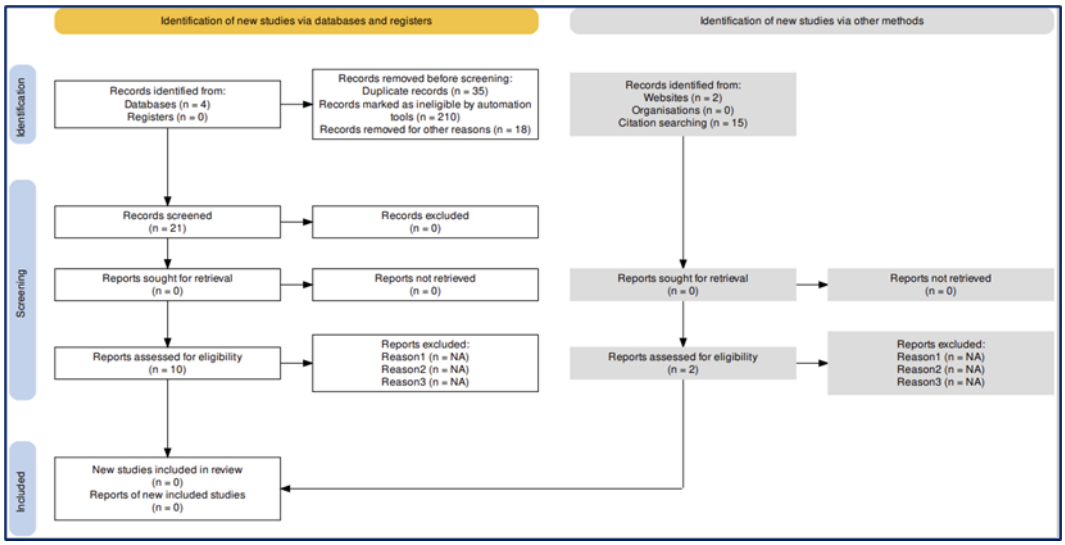
Yannopoulos et al. 2019	The evolving role of the cardiac catheterization laboratory in the management of patients with out-of-hospital cardiac arrest: A scientific statement from the American Heart Association	Non-experimental study	Patients with high-risk coronary artery disease	Evidence from randomized trials	Coronary artery disease as a significant contributor to cardiac arrest in a non-hospital setting	Level 3	Early access to the cardiac catheterization laboratory is associated with a 10% to 15% absolute higher functionally favorable survival rate compared with more conservative approaches of late or no access
Gupta et al. 2007	Capacity planning for cardiac catheterization: a case study	Cohort and simulation models	Patients awaiting cardiac catheterization	Analysis of waiting time and capacity planning	Too little capacity can result in excessive waiting and may also deter utilization by creating a high threshold for referral	Level 5	The median wait time was 6,36, and 99 days
Institute for healthcare improvement	Real-Time Demand/Capacity Management to Improve Flow	Qualitative, interpretive descriptive method	Optimizing patient flow	Identifying real time demand to enhance patient throughput	Managing demand and capacity to optimize patient care in acute care	Level 5	Careful coordination is required to eliminate delays and increasing availability of beds

Appendix D: Non-Research Evidence

Author/Year	Title/Design	Type of Evidence	Population Size/Setting	Analysis	Findings	Level of Evidence	Conclusion
Pringle, P. 2021	Waiting lists for heart patients continue to rise, NHS figures show	News Article	Adult patients	242,181 people waiting for cardiac procedures	Hospital waiting list data shows that 52,484 people have been waiting for over 18 weeks	Level 5	Delayed heart treatment is not only distressing for patients, but it can also mean they become more unwell, or even die on the waiting list
Dang et al. 2022	Johns Hopkins evidence-based practice for	Book published		Evidence from the opinion of	Implementing EBP in a transformed	Level 7	EBP practice enhances continuous

	nurses and healthcare professionals model and guidelines			authorities and/or reports of expert committees.	healthcare environment.		quality improvement and cost effectiveness
Tsao et al. 2022	Heart Disease and Stroke Statistics—2022 Update	Statistical Data Cardiovascular health	United States Adults	Study Life's Simple 7	In 2020, 19 million deaths attributed to cardiovascular disease	Level 5	Prevention of cardiac related deaths through early interventions

PRISMA Diagram – (Appendix E)



Appraise Quality and Level - Evidence Tables (Appendix F)

Study	Evidence level	Quality Guide
Weaver et al., 2022	Level 4	High Quality
Patel et al.,2019	Level 4	High Quality
Johnson et al., 2023	Level 6	Medium Quality
Blankenship et al., 2021	Level 4	High Quality
Duff et al., 2020	Level 6	Medium Quality
Valdovinos et al., 2020	Level 6	Medium Quality
Yannopoulos et al., 2019	Level 3	Medium Quality
Gupta et al., 2007	Level 5	High Quality
Pringle, P., 2021	Level 5	High Quality

Dang et al., 2022	Level 7	Medium Quality
Tsao et al., 2022	Level 5	High Quality

Theme Synthesis and Recommendation Tool – Appendix G

Study	Themes
Weaver et al., 2022	Complexity of comorbidities
Patel et al.,2019	Failure to treat in a timely manner
Johnson et al., 2023	Using the EBP model to implement change
Blankenship et al., 2021	Delay in treatment
Duff et al., 2020	Innovation and quality of care using EBP
Valdovinos et al., 2020	Racial/ethnic inequity in access to care with MI
Yannopoulos et al., 2019	Management of outpatients for cardiac catheterizations
Gupta et al., 2007	Capacity planning for cardiac catheterizations
Pringle, P., 2021	Wait time/delayed care for patients needing cardiac procedures
Dang et al., 2022	EBP practice model for practice improvements
Tsao et al., 2022	Statistics of Heart Disease

Stakeholder Analysis and Communication Tool - Appendix H

Stakeholder Analysis Metrix							
Stakeholder Title	**Role**	**Impact Level**	**Influence Level**	**What matters most to the stakeholder?**	**Stakeholder project contribution**	**How could the stakeholder impede the project?**	**Strategy(s) for engaging the stakeholder:**
Chief Nursing Officer	Approval	Significant	Significant	Patient care Quality service	Approve budget and process	Delay approvals	Cost savings Trust and credibility
Associate Medical Group Administrator	Consult Approval	Significant	Significant	Optimization of service line	Provide leadership to enhance team collaboration	Not following critical pathway	Patient satisfaction
Assistant Director of Nursing	Consult Inform	Significant	Significant	Project Implementation using EBP	Research and process project deliverables and tracker	Inadequate research and evidence to prove the theory	Better decision making Education
Cardiac Service Line Chief Physician	Consult Approval	Significant	Significant	Improve access for enhanced patient care	Collaborate with external facility and provider	Delay in synchronous communication	Patient satisfaction Credibility

Cardiac Service Line Director	Consult Inform	Significant	Significant	Department care delivery optimization	Align objectives with leaders and staff to enable changes	Delay in team collaboration and training	Patient satisfaction Education Empower
Quality Leader	Consult Inform	Significant	Significant	Quality care delivery, policy	Ensure policies and risk management resources	Insufficient information regarding policies	Better decision making Education
Nursing Staff	Consult Inform	Moderate	Moderate	New enhancements in care delivery	Learn process and assume responsibility per role deliverables	Resistance to change management	Patient satisfaction Unit development
Transportation	Inform	Minor	Minor	Timely transportation	Engage in timely communication for inter facility transfer using ACLS protocols	Delay in transport service	Improved health outcomes depend on timely transportation
House Supervisor	Consult Inform	Minor	Minor	Bed allocation	Ensure timely allocation of bed	Delay in bed allocation	Patient satisfaction Quality

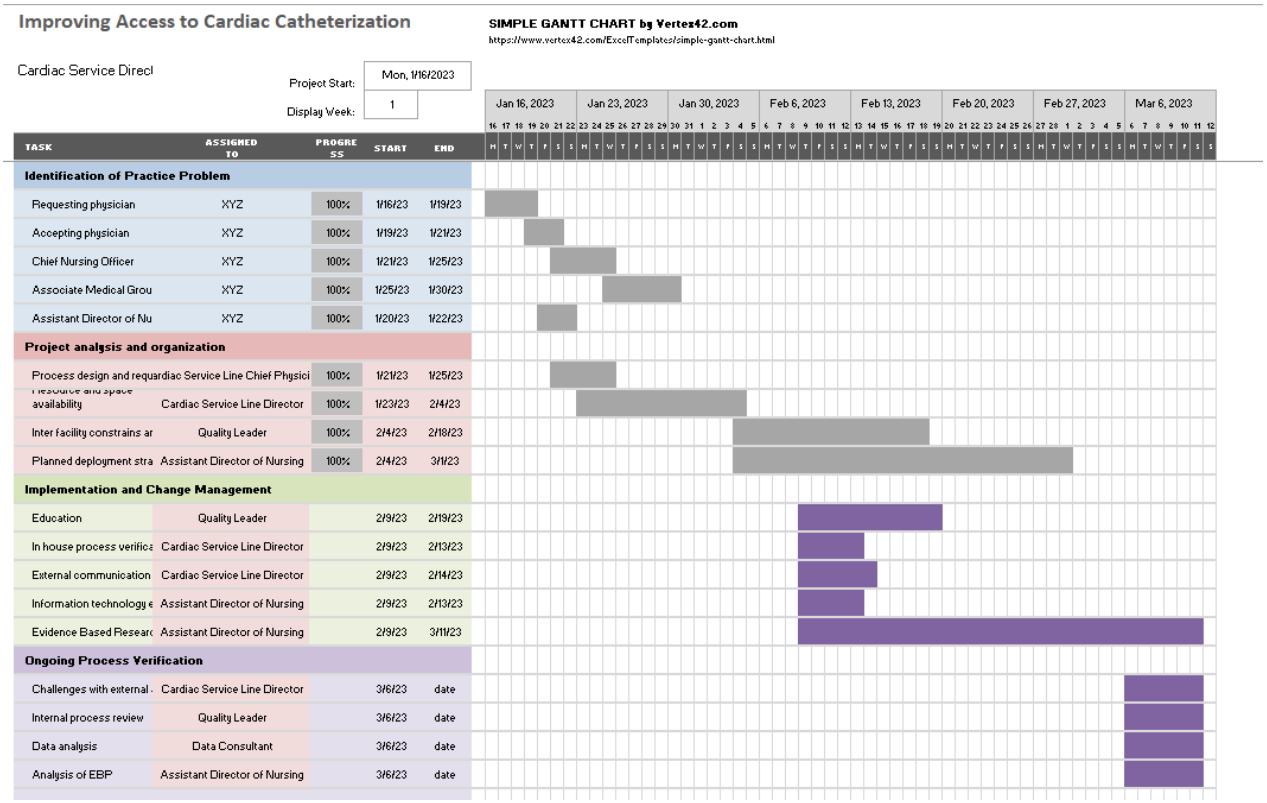
SWOT Analysis - Appendix I

S Strengths	W Weaknesses	O Opportunities	T Threats
▪ Center of excellence Cardiac Service line ▪ Existing infrastructure ▪ Skilled specialized staff ▪ Increased patient-centered approach	▪ Space restrictions ▪ Staffing shortages ▪ Dependent on transport availability and time to transfer. ▪ Requires involvement and commitment from all stakeholders.	▪ Improve interfacility collaboration and practice delivery. ▪ Enhance patient-reported outcomes. ▪ Community/population benefits through shared collaboration and coordination of care.	▪ Patient acceptance ▪ Risk of patient stability during transfer ▪ Shared responsibility ▪ Liability

SMART Goals – Appendix J

S	Patients requiring cardiac catheterization
M	Reduce the wait time for transfer from an outpatient facility
A	Create a pre-admission hold area for direct intake
R	Improves patient outcomes
T	Within 60 days of referring physician orders

GANTT Chart - Appendix K



Project Budget – Appendix L

Project Budget - Cardiac Services

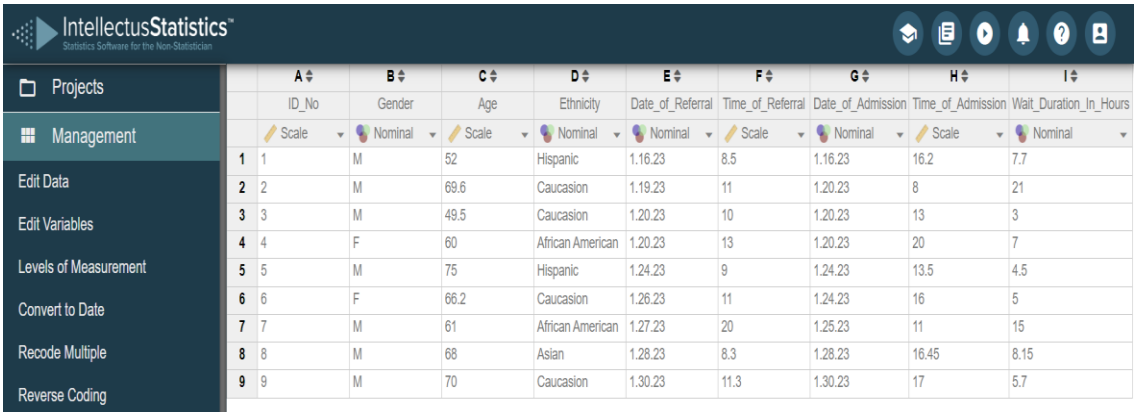
Project Name:	Improving access to cardiac catheterization
Department:	Cardiac Services
Department Chair	Dr. XYZ

			Labor			Materials							BALANCE
			Planned	Actual Hours	$/HR	UNITS	$/UNITS	Travel	Equipment	Fixed	Misc.	BUDGETED	ACTUAL	UNDER/OVER
WBS	Project Tasks	Assigned To:										$ 1,020.00	$4,078.00	$ (3,058.00)
1.0	Payroll Units - Admission RN	Cardiac Service Line Director	8.0	8.0	$98.00	100.0	$5.00			$50.00		300.00	1,334.00	(1,034.00)
2.0	Payroll Units - Procedure RN	Cardiac Service Line Director	8.0	8.0	$98.00			30.0		$100.00		300.00	914.00	(614.00)
3.0	Payroll Units - Post Procedure NP	Cardiac Service Line Director	8.0	8.0	$120.00	50.0	$11.00					100.00	1,510.00	(1,410.00)
3.1	Payroll Units - Scheduling	Cardiac Service Line Director	8.0	8.0	$40.00							320.00	320.00	-
	SUBTOTAL				$2,848.00		$1,050.00	30.0		$150.00	0.0	1,020.00	$4,078.00	(3,058.00)

Data Analysis – Cardiac Cath Lab External Referral - Appendix M

Date	External Transfer Ready	Transportation Time (hrs)	Receiving Time	Admit to Procedure Time
7.1.23	14.25	3.90	18.15	1.38
7.2.23	8.14	1.13	9.27	1.72
7.5.23	10.20	10.81	21.01	1.70
7.7.23	11.22	3.10	14.32	1.53
7.18.23	11.50	4.54	16.04	2.62
7.21.23	13.53	3.76	17.29	1.70
7.27.23	11.56	2.69	14.25	1.53
7.28.23	12.47	2.92	15.39	1.63
8.8.23	11.29	8.00	19.29	1.40
8.19.23	6.37	3.91	10.28	2.62
8.22.23	11.59	5.61	17.20	2.73
9.9.23	9.55	3.68	13.23	2.60
10.25.23	8.35	2.76	11.11	1.52
11.2.23	8.15	7.44	15.59	5.07
11.11.23	7.38	3.83	11.21	2.22

Intellectus Statistics Data Analysis Method – Appendix N



	A	B	C	D	E	F	G	H	I
	ID_No	Gender	Age	Ethnicity	Date_of_Referral	Time_of_Referral	Date_of_Admission	Time_of_Admission	Wait_Duration_In_Hours
	Scale	Nominal	Scale	Nominal	Nominal	Scale	Nominal	Scale	Nominal
1	1	M	52	Hispanic	1.16.23	8.5	1.16.23	16.2	7.7
2	2	M	69.6	Caucasion	1.19.23	11	1.20.23	8	21
3	3	M	49.5	Caucasion	1.20.23	10	1.20.23	13	3
4	4	F	60	African American	1.20.23	13	1.20.23	20	7
5	5	M	75	Hispanic	1.24.23	9	1.24.23	13.5	4.5
6	6	F	66.2	Caucasion	1.26.23	11	1.24.23	16	5
7	7	M	61	African American	1.27.23	20	1.25.23	11	15
8	8	M	68	Asian	1.28.23	8.3	1.28.23	16.45	8.15
9	9	M	70	Caucasion	1.30.23	11.3	1.30.23	17	5.7

Evidence-Based Poster Presentation Template - Appendix O

<table>
<tr><td colspan="3">Logo Here
Clinical Organization

Evidence-Based Practice Initiative Title

Author Names, Credentials

Logo Here
Academic Organization</td></tr>
<tr><td>Background/Significance

Spirit of Inquiry/
Clinical Inquiry

(Organizational Assessment, Cultural Readiness, EBP and/or Change Framework)

PICOT Question

Search Strategy</td><td>Evaluation/Summary &
Synthesis of Evidence

Appraisal
Evaluation/Summary
Table or Synthesis
(Body of Evidence)

Synthesis Tables:
Levels of Evidence
Interventions
Outcomes</td><td>EBP Change
Recommendation &
Implementation Plan

Outcomes & Measurement
Plan
(Evaluation, Return on Investment, Sustainability)

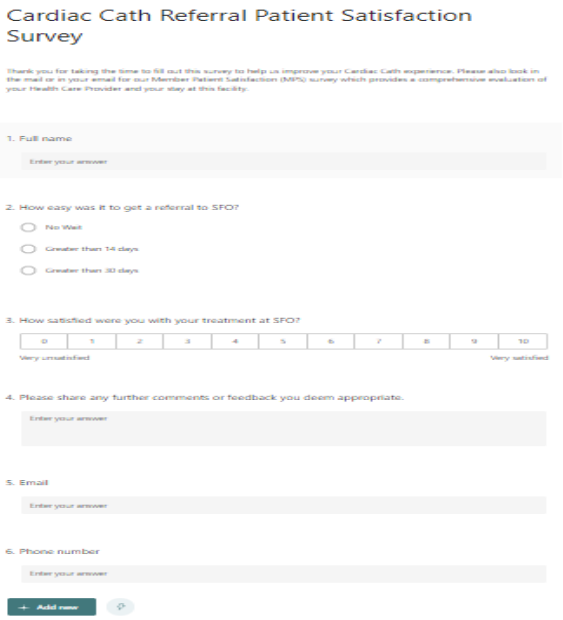
Recognition & Celebration

Dissemination Plan
(Internal/External)

References</td></tr>
</table>

Worldviews Ev Based Nurs, Volume: 18, Issue: 3, Pages: 158-160, First published: 09 May 2021, DOI: (10.1111/wvn.12502)

Cardiac Cath Referral Patient Satisfaction Survey – Appendix P



Cardiac Cath Referral Patient Satisfaction Survey

Thank you for taking the time to fill out this survey to help us improve your Cardiac Cath experience. Please also look in the mail or in your email for our Member Patient Satisfaction (MPS) survey which provides a comprehensive evaluation of your Health Care Provider and your stay at this facility.

1. Full name
Enter your answer

2. How easy was it to get a referral to SFO?
- No Wait
- Greater than 14 days
- Greater than 30 days

3. How satisfied were you with your treatment at SFO?
0 1 2 3 4 5 6 7 8 9 10
Very unsatisfied — Very satisfied

4. Please share any further comments or feedback you deem appropriate.
Enter your answer

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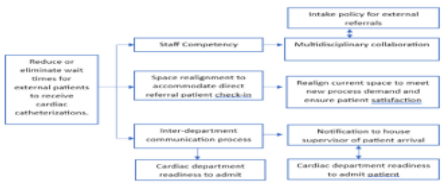
Poster Presentation – Appendix Q

Project Name: 2023 Modifying Cardiac Cath Holding Area for Direct Referral Intakes as a Continuous Process Improvement	**Sunitha Dharman, ADONCP**	**Date of last review: 9/24/2023**
Sponsors: Natalie Roessler, DONCP Surita Sharma, AMGA	**Project Lead**: Sunitha Dharman **Educator**: Shanna Lalchandani **Unit Leaders**: Brian Gutierrez and Catherine Raymond	
Smart Goal: By September 30, 2023, we will effectively establish the process of direct admits for external Cardiac Cath referrals to eliminate wait time created by waiting for an assigned admission bed in the cardiac unit before the procedure.	**Problem Statement**: For patients awaiting cardiac cath at external associate medical centers, there is a significant opportunity for improvement to reduce the wait time for the procedure, as barriers to this process put the patient at an increased risk of morbidity and mortality.	
Current Practice Analysis: Reviewed June 2023 The referral process is initiated by an external referring physician to the receiving facility. ▪ Receiving facility in SFO has an ongoing high census which makes it challenging to reserve beds for external referrals and admissions. ▪ Delayed admission beds = delayed referral admissions = delayed care for patients with increased risk of morbidity and mortality. ▪ Limited space in the cath lab area to accommodate expansion of perioperative areas. ▪ Lack of privacy and heavy foot traffic in pre-procedure space	**RCA translated into Driver Diagram**  	
Process Change Required Optimize space utilization. ▪ Enhance the referral process. ▪ Determine scheduling process with direct admit. ▪ Create direct admission to the holding area to eliminate wait time for admission beds on the cardiac floor. ▪ Review inter-departmental communication to process bed requests on patient referral acceptance. ▪ Review external collaborators and transport process. ▪ Review the discharge process to enable discharge post stabilization to the referral facility.	**2023 Process Milestones** ▪ Unit leaders determine barriers to standard processes and space limitations. Holding area optimized to accommodate direct admission. ▪ Interdisciplinary/Inter Facility Collaboration: Streamline processes like scheduling, data transfer and clinician handoff, transport, direct admission to the cath lab holding area, house supervisor notification, and cardiac department admit readiness or transfer process to the referral center. ▪ Education: Enhanced communication and education to implement a process to mitigate any unsafe or unexpected processes during patient transfer. ▪ Culture: Ensure continued excellence through policy adherence to improve performance for patient care.	