

The University of San Francisco

USF Scholarship: a digital repository @ Gleeson Library | Geschke Center

Doctor of Nursing Practice (DNP) Projects

All Theses, Dissertations, Capstones and
Projects

Spring 5-18-2023

Improving Patient Safety for Surgical Clearance: A PreOp One Stop Shop

Anna Benedictos
abenedictos@usfca.edu

Follow this and additional works at: <https://repository.usfca.edu/dnp>



Part of the [Nursing Commons](#)

Recommended Citation

Benedictos, Anna, "Improving Patient Safety for Surgical Clearance: A PreOp One Stop Shop" (2023).
Doctor of Nursing Practice (DNP) Projects. 331.
<https://repository.usfca.edu/dnp/331>

This Project is brought to you for free and open access by the All Theses, Dissertations, Capstones and Projects at USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. It has been accepted for inclusion in Doctor of Nursing Practice (DNP) Projects by an authorized administrator of USF Scholarship: a digital repository @ Gleeson Library | Geschke Center. For more information, please contact repository@usfca.edu.

Improving Patient Safety for Surgical Clearance: A PreOp One Stop Shop

Anna Benedictos, DNP (c), MSN, RN, CNL

University of San Francisco

School of Nursing and Health Professionals

Committee Chair: Dr. Juli Maxworthy, DNP, PhD (c), MSN, MBA, RN, CNL, CPHQ, CPPS

Committee Member: Dr. Cathy Coleman, DNP, RN, CPHQ, CNL

May 12, 2023

TABLE OF CONTENTS

Title	1
Abstract	5
Introduction	6
Background	6
Problem Description	6
Setting	8
Specific Aim	8
Available Knowledge	8
PICOT Question	9
Search Methodology	9
Integrated Review of the Literature	10
Improved Patient Outcomes	11
Patient-Centric Care	13
Ways to Reduce Cost and Waste	14
Impact of Fragmented Care on Patient Care Experience	16
New Available Evidence	17
Summary/Synthesis of the Evidence	18
Rationale	18
Conceptual Framework	19
Theoretical Framework	19
Methods	20
Context	20
Interventions	21

	3
Study of Interventions	22
SWOT Analysis	22
GANTT Chart	23
Work Breakdown Structure.....	23
Communication Matrix	24
Process Map	25
Cost	25
Budget/ Return on Investment	25
Outcome Measures	26
Analysis	26
Ethical Considerations	26
Results	28
Evolution of Interventions	28
Discussion	29
Summary	30
Limitations.....	30
Conclusion	31
Other Information	31
References	33
Appendices	41
Appendix A. PRISMA Worksheet	41
Appendix B. Evidence Evaluation Table	42
Appendix C. IHI/ Model for Improvement Data Table.....	52
Appendix D. Healthcare Delivery Model	53

Appendix E. SWOT Analysis 54

Appendix F. Communication Matrix 55

Appendix G. GANTT Chart 56

Appendix H. Work Breakdown Structure 57

Appendix I. Cancellation Tracker 58

Appendix J. Return on Investment Cost Savings/ Cost Avoidance 60

Appendix K. IRB Statement of Determination 62

Appendix L. Letter of Support 64

Abstract

Problem: Medical clearance is required for patients scheduled for surgery, also known as “patient optimization.” Ineffective and inefficient patient optimization is a major contributor to surgery postponements, procedure cancellations, and patient dissatisfaction.

Context: Ambulatory care clinics often lack resources to medically clear patients prior to scheduled surgery. Poor surgical optimization continues to occur on the same day of surgery, resulting in case cancellation or delay in a suburban, 169 bed community hospital with 9 operating rooms and approximately 500 surgical procedures per month.

Interventions: A nurse-led PreOp One Stop Shop (POSS) utilized a standardized checklist to perform preoperative surgical assessment.

Measures: System-generated reports assisted in ranking contributing factors that impacted day of surgery cancellations rates, outpatient care experience scores, and staff engagement metrics were reviewed and analyzed weekly between August 2021 to July 2022.

Results: A nurse-led POSS decreased the number of same-day surgical cancellations from 10% to 3%, improved the standardized patient care experience measures from 78% to 79%, and increased internal staff engagement scores from 72% to 77% by July 2022.

Conclusion: A standardized checklist and associated workflows are recommended for routine presurgical assessment to expedite medical clearance and promote reliable patient optimization. The implementation of a nurse-led PreOp One Stop Shop (POSS) can lead to improved patient safety outcomes and add value for organizational metrics such as patient centered care and staff engagement.

Keywords: surgical cancellations; patient optimization; workflows; care experience; medical clearance; safety

Background

The Joint Commission Center for Transforming Healthcare has launched the Safe Surgery Training Modules to assist organizations in identifying “defects,” also known as points of risk for wrong-site surgery (The Joint Commission [TJC], 2023). Patient safety risks can cause patient harm due to workarounds of existing organizational processes. A redesign of the surgical optimization pathway is required to meet patient care needs for safe surgical clearance.

Surgery case cancellations can cause patients emotional, financial, and resource strain, costing hospitals thousands of dollars in wasted staffing, supplies, and other resources for scheduled and subsequently canceled perioperative patients (Best, 2020; Kwon, 2018). Day of Surgery (DOS) cancellations are also linked to nursing quality indicators that contribute to the economic and emotional harm experienced by patients (Turunen et al., 2018). This Doctor of Nursing Practice (DNP) nurse-led performance improvement project describes a PreOp One Stop Shop intervention implemented to increase the quality of medical clearances to ensure the best patient and organizational outcomes. According to American Association of Colleges of Nursing [AACN], DNP leaders are well-positioned at the macrosystem level to evaluate the cost-effectiveness of care using principles of economics, financial management, and improvement science to redesign effective care delivery that contributes to realistic policymaking and strategic communication while decreasing practice variation across an integrated system (AACN, 2023).

Problem Description

Surgical procedures for people aged 65 years or over will increase from 524 million to 1.5 billion by 2050 and are associated with an increased rate of postoperative complications and same-day readmissions (Chaturvedi et al., 2021; Wright et al., 2016). The World Health Organization implemented a study that sanctioned surgical safety checklists adopted by healthcare organizations (Jain et al., 2018). This study included 6,775 operations that

demonstrated an overall reduction of incidents of complications and death that are known today as “never events” (National Quality Forum [NQF], (2023). A “never event ” signifies serious, medically preventable, and reportable medical errors classified into seven categories (NQF, 2023). These seven categories are related to 1. surgical/ procedures; 2. products or devices; 3. patient protection; 4. care management; 5. environmental; 6. radiological; and 7. criminal acts. These events are avoidable, threaten the organization's reputation, and should never happen at any point during care delivery.

Local Problem

Three sources of internal data served to inform and define the local surgical safety concerns in this institution. First, during staff debriefings, avoidable events were identified as unacceptable outcomes. Second, another factor contributing to safe surgery is the creation of a speak up culture which encourages any employee observing potential risk of harm to communicate immediate action (Agency for Healthcare Research and Quality [AHRQ], 2019). Unfortunately, recent organizational employee engagement survey results from an external vendor (<https://www.glintinc.com/people-success-platform/>) identified *improvements needed* in fostering a “Speak Up” culture. Quarterly data suggested a decrease from 72% to 68% in the overall employee engagement score. Third, an increased number of complaints by patients during telephone intake preoperatively alarmed the leadership team because various medical providers were seemingly circumventing routine preoperative medical clearance checks.

To address these problems, a performance improvement initiative was implemented utilizing safety stops and a standardized checklist during the preoperative period to supplement other system-wide safety precautions. Nurse leaders must implement systems to avoid any events that can cause patient harm or adverse surgical outcomes that cost hospitals millions of dollars (Lembitz & Clarke, 2009).

Setting

This evidence-based change of practice project was conducted in a 169-bed inpatient hospital in central California with an affiliated ambulatory surgery center that performs approximately 500 surgeries per month. This medical center is a part of a managed care network and integrated health system which serves as one of the largest private employers in the Central San Joaquin Valley, with more than 2,300 employees and physicians (Kaiser Permanente [KP], 2023).

Specific Aim

Over ten months, the specific aim of this project was to create a comprehensive and evidence-based, nurse-led PreOp One Stop Shop (POSS) intervention to improve surgical safety outcomes. These outcomes included same-day surgical cancellations, patient care experience measures, and staff engagement scores.

Available Knowledge

Currently, the Centers for Medicare & Medicaid Services [CMS], (2022) rate and compare hospital outcomes through public reporting on their website (<https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/hospitalcompare>). Hospitals are given ratings from one to five stars, with the highest rating of five indicating the best patient care experience (CMS, 2022). Most hospitals report a three-star rating to influence the public to choose one organization over another. The star rating for this institution has remained at three of five over the past year.

Regarding medical clearance, there is no universal standard of practice for clearing a patient medically for surgery (Jain et al., 2018). However, there are similarities in the patient screening process that support the development of a tool for a new approach - The Preop One Stop Safety Shop. Before the COVID-19 pandemic, Haugen et al. (2015) and Sexton et al.

(2006) recognized patient safety as an increasing priority for surgeons and hospitals through the Safety Attitude Questionnaire (SAQ) which was specific to surgery. Although this questionnaire is available for hospitals and surgeons, the SAQ is optional for employees to participate.

Employee data from this survey can add meaningful insights for change management and patient safety. Unfortunately, after COVID-19, the staff participation in this setting was too low to be meaningful. Standardized and reliable procedures were absent, and workflow redesign was deemed critical to implement safety interventions within frontline operations and interdisciplinary teams across this healthcare system.

PICO(T) Question

A PICOT (population, intervention, comparison, outcome, and timeframe) question is formulated to guide effective literature searches. The PICOT question for this literature search was: In adult surgical patients, will a preop safety stop checklist to improve surgical optimization and enhance the medical clearance process for elective surgical cases compared to current practice, positively impact same-day surgical cancellation rates within one year of implementation.

Search Methodology

This is a literature review compiled from the following electronic databases: CINAHL COMPLETE, Cochrane Database, Medline, and PubMed search conducted with limitations set to English, peer-review journals, and publication dates between 2017 to 2022 using a combination of keywords: *surgical, cancellations, patient optimization COVID-19, workflows, care experience, surgery clearance, communication, safety stop*. Articles selected for the literature review focused on the themes affecting fragmented care systems: fragmented, costly, inefficient, lack of patient-centered care, and reported patient dissatisfiers.

Integrated Review of Literature

A systematic literature review was conducted using the Preferred Reporting Items Systematic Review (PRISMA) checklist to identify literature on medical clearance criteria from 2017 to 2022 (Appendix A). The range of evidence found in the articles pointed to the value of creating one location where patients would receive a preoperative assessment including labs, medication reconciliation, and a review of systems that reduced the risk of postoperative complications and optimized patient outcomes. Ten of twelve articles report themes of interventions that were generalizable to the current hospital setting. After reading and analyzing these publications, further investigation was conducted to identify content relating to specific interventions, nursing practice, and costs. Studies ranged from quality levels of evidence I to III, with systematic reviews and randomized controlled trials (RCT) supporting the findings (Evidence Evaluation Table, Appendix B).

A total of ten studies were selected for this integrated review. Nine of these articles provided significant evidence to redesign the surgical pathway and create effective interventions to reduce risk of patient harm (Al Talalwah & McIltrout, 2019; Fayed et al., 2016; Grocott, 2019; Kamdar et al., 2020; Mullen et al., 2017; TJC, 2023; Wallace et al., 2021; Wilson et al., 2022; Rathnayake et al., 2021). Six studies of the ten articles measured the efficacy of patient optimization through a multimodal approach (Al Talalwah & McIltrout, 2019; Childers et al., 2019; Colquhoun et al., 2020; Ghaferi et al., 2009; Meng et al., 2018; Nicholson et al., 2018). Overall, four themes emerged from this literature review: improved patient care outcomes, patient-centric care, methods to reduce cost and waste, and the impact of care fragmentation on the patient care experience.

Improved Patient Outcomes

According to Wallace et al., (2021) research determined the surgical case cancellation cost, and mitigating the impact is not a small problem. These authors found that surgeries account for a significant part of the institutions' income. Furthermore, the COVID-19 pandemic was not an excuse to compromise the quality-of-care patients received during their surgical journey. According to Vacheron et al., (2023), postop surgical site infections, wrong site surgeries, and readmissions to the hospital remain preventable. Mullen et al. (2017) conducted a research cohort study designed to measure the impact of surgical site infections through the participation of orthopedic patients and surgical staff. Staph aureus infection rates for three months were 1.36, 2.38, and 1.55 per 100 surgeries. Mullen et al. (2017) also found statistically significant infection rates reduced from 1.76 to 0.33 infections per 100 surgeries representing an 81.3% reduction from baseline ($P=0.036$) during July 2015-September 2016. Hospital records indicated that neither of the other two orthopedic surgical groups experienced a decline in infections. This was attributed to the adherence rates of the relevant treatment protocols. This article was rated as Level of Evidence II B (Appendix Evidence Table B: Mullen). These two studies' findings add value to practice, as evidenced by decreased infection rate and better patient outcomes (TJC, 2023).

The patient's fitness for surgery requires a combined effort of nurses, physicians, and other support staff to coordinate elective surgical services (Nicholson et al., 2018). This study aimed to conduct predictive analytics by identifying factors that patients and care providers could influence. The study findings concluded that patients had improved outcomes when interventions engaged patients in active participation. In addition to a surgical fitness assessment, three preoperative modifiable risk factors included effective supplementation of nutrition, immediate smoking cessation, and optimization of a patient's mobility plan (Meng et al., 2018).

Meng's study aimed to investigate the incidence of Deep Surgical Site Infection (DSSI) after Open Reduction Internal Fixation (ORIF) of ankle fractures and tested the hypothesis that clinical variables and biochemical indices from lab results were independent predictive values in SSI occurrence. Meng et al. (2018) conducted a retrospective review case-control study of an adult population sample (n= 2617) at three level-I trauma centers from January 2013 to June 2017. This study reported a 2.83% DSSI incidence rate within 1-year postoperatively. The limitation of sole reliance on electronic medical records (EMR) may have compromised data accuracy, and other variables that were reported as unavailable. This study rated a II B research appraisal (Dang et al., 2022; care experience).

Redesigning patient optimization workflow was one of the dimensions associated with the clinical practice elements nursing synthesized to provide patients with background knowledge (Ljungqvist et al., 2017). Webster & Osborne (2015) conducted a RCT review focused on preventing surgical infections using perioperative bathing or showering with antiseptic. The sample (N=10,157) included men, women, and children undergoing any surgery setting. The dependent variable was the rate of infection acquired after studying three independent variables with combinations of 4% chlorhexidine gluconate. Independent variables studied: bathing with chlorhexidine compared with placebo, bar soap with chlorhexidine, and bathing with chlorhexidine without washing.

The study found a statistically significant difference in favor of bathing with chlorhexidine to no washing, evidenced by Relative Risk= 0.36 with a 95% Confidence Interval. The limitations of this study provided no clear evidence of the benefit of preoperative showering or bathing in chlorhexidine over other products. The strengths of this study provided insight using a multimodal approach and rated as Level of Evidence IB using the JHEBP research appraisal tool.

Mullen et al. (2017) also studied additional interventions coupled with surgical site preparation based on research studies investigating the impact of adding presurgical nasal decolonization of patients and surgical nursing staff. A quasi-experimental cohort (n= 1,070) added a pre-surgical application of a non-antibiotic alcohol-based nasal antiseptic with existing chlorhexidine bath/wipes. Independent variables included surgeries, age, sex, inpatient days, and antiseptic used; the dependent variables were the results of the cultures from surgical patients readmitted for SSI. Findings reported a mean change from 1.76 to 0.33 infections per 100 surgeries with an 81.3% reduction in SSI. Bundling patient skin and nasal decolonization is effective and statistically significant ($P = .036$), and this study was rated as an III B using the JHEBP research appraisal tool.

One randomized controlled trial identified causes of cancellations that were classified into three categories: hospital-related reasons, patient-related reasons, and surgeon-related reasons confirming that most cancellations were avoidable (Al Talalwah & McIltrout, 2019). The avoidable cancellations included limited access to kits containing pre-day surgery items: chlorhexidine wipes, incentive spirometer, and carbohydrate drink. Delivery options for Enhanced Recovery After Surgery (ERAS) kits, home delivery, and in-person pickup at the medical center were available. This study did not include surgery cases added to the schedule one day before surgery.

Patient-Centric Care

It is important to anticipate and address barriers to reduce the risk of the day of surgery cancellation. The Perioperative Surgical Home (PSH) participants used a shared decision-making model that integrated patient values, preferences, and an environment where the healing would continue after the same-day discharge (Keränen & Keränen, 2011; Kwon, 2018). The multidisciplinary approach streamlined the communication by integrating a system safety stop

led by nurses to conduct a final chart review confirming surgery clearance. This allowed the nurse navigator to advocate for patient care needs that were patient-centric, specific to the case, and directed to the appropriate discipline scope (Ghaferi et al., 2009). Additional evidence from this study demonstrates that care practices with outcome reporting supported the creation of their Multicenter Perioperative Outcomes Group.

Ways to Reduce Cost and Waste

The first step to reduce DOS cancellations and the negative financial impact is to identify specific root causes (Wallace et al., 2021). Reasons for cancellations were stratified into three categories: patient-made, OR-made, or practice-made cancellations (Kamdar et al., 2020; Fayed et al., 2016). The Perioperative Surgical Home (PSH) phenomenon began in 2014 and continues to deliver successful patient outcomes (Kain et al., 2014). Studies using the patient-centric care models were typically led by the anesthesiology department that oversees the follow-up care thirty days after discharge (Kain et al., 2014; Keränen & Keränen, 2011; Keränen et al., 2007; Kwon, 2018). The PSH model described by Kain et al. (2014) aimed to reduce the variability in perioperative care. This study generated a cost savings of \$630 million/year by standardizing protocols for anesthesia providers and surgical care teams, which improved surgical workflow. Childers et al. (2019) compared cost center-specific and hospital-wide cost-to-charge ratios for operating room services in various hospital settings. These studies concluded that integrated standardized practices for patient optimization would improve operational costs.

Hospital Cost-To-Charge (CTC) ratios are compared to evaluate opportunities to improve productivity and cost savings. Using a utilitarian ethical framework to guide equitable cost reporting, Childers et al. (2019) cautioned organizations to review the setting of the study. The study demonstrates that the risk of implementing a reported process with a low CTC ratio may

cost more resources based on the calculation method. The study recommends using the median (interquartile range CTC ratio deviation from Hospital CTC) to evaluate cost savings. This study provided context to surgical care costs, added value to CTC measure, and demonstrated the importance of standardizing cost variables when evaluating finance reporting and waste reduction (Childers et al., 2019).

Wilson et al. (2022) conducted a mixed-method study that implemented a five-part cultural and process redesign strategy over three years. The study aimed to eliminate preventable patient harm such as falls with injuries, pressure injuries, central line-associated infection, medication reconciliation, and irretrievable specimen rate. The study was conducted across a multisite regional health system consisting of 96 settings of continuing care, rehabilitation beds, 168 long-term care beds, and 112 reactivation care center beds that used a safety culture survey to develop the five-element strategy.

Wilson et al. (2022) analyzed the patient safety incident reports and noted a baseline average of 11.80 incidents per 1000 patient days. According to Wilson et al. (2022), this was a low percentage of incident reports which correlated with the safety culture survey results. The need to focus on the barrier to patient safety event reporting led to the implementation of five elements: (1) leveraging leadership support in planning and implementation, (2) developing a local quality and patient safety framework, (3) establishing meaningful quality aims, (4) standardizing implementation of safety review processes, and (5) creating a comprehensive communication plan (Wilson et al., 2022) as the independent variables.

The clinical incident reports data suggests that a safety event reporting system will increase reporting compliance and significantly reduce patient harm. Wilson et al. (2022) findings reported a baseline average of 11.80 reported incidents had increased by 37% to 16.15 reports per 1000 patient days over the eight months. Simultaneously, the study developed a local

quality and patient safety workflow, mandated a safety review process, and provided real-time updates on progress via electronic dashboards. Although this study was limited in obtaining robust historical data on patient safety indicators prior to 2019, this study was feasible to implement and aligned with the surgical services workflow redesign envisioned within this author's DNP project scope. Wilson et al. (2022) and AHRQ (2019) emphasized the importance of instituting a just culture by encouraging staff to speak up and report patient safety events.

Impact of Fragmented Care on Patient Care Experience

Access to healthcare services is an ongoing issue affecting patient safety, care fragmentation, and team communication (Colquhoun et al., 2020). DOS cancellations are therefore more significant than organizations may realize due to their impact on access and patient care experience (Wallace et al., 2021; Kamdar et al., 2020; Fayed et al., 2016). According to Colquhoun et al. (2020), their quasi-experimental study aimed to build a standardized repository platform that integrated perioperative-specific electronic records to synthesize information used to conduct process improvement interventions. Two medical centers reduced the length of stay for same-day discharge patients by using more than one platform to evaluate process improvement efforts that lead to better patient outcomes (Colquhoun et al., 2020; Fayed et al., 2016; Webster & Osborne, 2015).

Eyrich et al. (2021) conducted a Level of Evidence II-A Quasi-Experimental Cohort study that used technology to improve appointment compliance. This study is relevant for decreasing fragmentation and demonstrates how partnerships with business and industry can achieve mutual benefits through service-level agreements. For example, Apple Inc. partnered with this study group to provide iPads and Wi-Fi hotspots to decrease appointment cancellations. As a result, the rate of virtual appointments continued to improve for those who agreed to participate in the study. These results were considered generalizable due generational technology

exposure, increased interaction, and to close basic technology knowledge gaps, to decrease care fragmentation (Eyrich et al., 2021). By integrating technology and healthcare delivery, results in better care coordination, access, and communication. This study's findings support methods of telephone or video visits with providers to redesign preop assessments. Kamdar et al. (2020) provided level II A evidence by combining technology in developing, implementing, and evaluating telemedicine preoperative clinic visits. This study was conducted over a two-year period that evaluated 419 surgical patients scheduled for telemedicine and 1785 patients scheduled for an in-person evaluation. Telemedicine patients avoided round-trip driving distance of 63 miles and an average time saved of 137 minutes on the day of surgery. The telemedicine-based preop assessment cohort cancellation rate on the day of surgery was 2.95% less when compared to the in-person cohort cancellation rate of 3.23%. This study demonstrated the time savings and cost savings of \$67 per telemedicine patient. In addition, patient satisfaction scores reached 97% of 100%, and there was no increase in same-day surgery cancellations (Kamdar et al., 2020).

New Available Evidence

The literature review provided insight into evidence-based practices that can influence performance ratings in regional, national, and worldwide practice settings. Some changes required upstream interventions and nursing practice redesign to develop a system-wide checklist for handoffs that required flexible workflows. Rathnayake et al. (2021) conducted a systematic review to bridge the gap in existing literature that discuss patient prioritization. This study provided a framework to improve the quality and efficiency of elective surgical care acuity by standardization. The independent variables were prioritization tools utilized to measure surgery wait times. The standardization tools were Clinical Priority Assessment Criteria, Multi-attribute Prioritization Tool, and the National Indications model for Cataract Extraction. This study

provided evidence that supported a standardized system to prioritize patient care delivery that would most likely improve equitable access to and reduce surgery waiting times (Rathnayake et al. 2021).

Summary/Synthesis of the Evidence

Across the nation, elective surgical case backlog has negatively affected operations, productivity, and patient care experience ratings. Patients continue to report a redundancy of telephone calls, texts, and emails, leaving them confused and anxious. Redesigning the perioperative process should include interventions that support new technology, address generation gaps in patient populations, improve nursing workflows, and optimize patient-centric care.

Traditional patient preparation for surgery has transformed in the last decade by implementing Enhanced Recovery After Surgery (ERAS) methods (Ljungqvist et al., 2017; Loodin, A. & Hommel, A., 2021; Meng et al., 2018; Webster & Osborne, 2015). Perioperative surgical preparation practices have evolved to a virtual clinic model that supports the components of ERAS, including early ambulation, early nutrition, and preventative interventions such as incentive spirometer teaching to prevent postoperative complications, surgical site chlorhexidine solution/wipes, and carbohydrate drinks for glycemic control (Childers et al., 2019; Colquhoun et al., 2020; Ljungqvist et al., 2017). This literature review reinforced that by redesigning practice workflows, nursing professionals had an opportunity to lead change in value-based system initiatives with a focus on preventative, perioperative nursing interventions, to reduce costs, waste, and care fragmentation.

Rationale

During the COVID-19 pandemic, all elective surgeries were postponed or canceled. The patients expressed growing concerns about contracting the COVID-19 virus, and surgical site

infections continued to threaten the safety practices while learning to implement new workflows. Canceling all elective cases was unacceptable. The organization needed to perform elective surgeries and was tasked to quickly establish a standardized workflow using readily available resources without compromising patient and safety.

In the current practice setting, patient dissatisfiers were related to last-minute changes, late add-on cases, inefficient workarounds to supply ERAS kits, and inconsistent messaging throughout the surgical journey. Hospitals are rated based on Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) reports of Star Ratings from 1 star= lowest to 5 stars= best (CMS, 2022). This QI project implementation was designed to create a safety net to maintain the highest quality of patient care at every touchpoint through the surgical optimization pathway while working on improving the HCAHPS Star Ratings.

Conceptual Framework

This DNP project utilized two frameworks including the Institute for Health Improvement (IHI) Model for Improvement (MFI) and Watson's Human Caring Model. IHI's *Science of Improvement Model* explained, guided, measured and tested the project interventions to create the Preop One Stop Shop within Perioperative Services (IHI, 2021). Another framework included Dr. Jean Watson's Caring Theory. This theory described the relational science of nursing expressed as embracing caring moments and shared experiences between patient and nurse connectedness (International Association for Near-Death Studies, 2017). Dr. Jean Watson's theoretical framework of the *Human Caring Model* guides the practice of nursing ethics and moral principles outlined in the 10 Caritas Processes (2023).

Theoretical Framework

Patients experiencing the surgical patient optimization journey reveal hardship and circumstances that drive the need to explore solutions to disconnected systems based upon Dr.

Watson's Human Caring theory (2023). The theoretical framework of Human Caring Science was selected because it focused on the importance of a shared experience and relational process between the patient and nurse interaction (Foss-Durant, 2014). For example, the members of the QI project taskforce have reported feeling increased amounts of stress trying to balance tasks with making a heart-to-heart connection.

Another rationale for choosing the Watson theory relates to patient feelings. Patients often share their feelings after an episode of care. For example, patients' verbatim comments throughout this project included "*feeling like a number and not a person*" (Leigh Saefong, personal communication, 2023). Throughout the QI project, the implementation team communicated missed opportunities for patients to receive preoperative instructions and they were met with resistance when trying to connect the patient with the right services. Face to face staff interviews were conducted by the DNP lead to better understand the resistance and barriers. Results of the interviews revealed that the nurses would postpone their lunch breaks and prioritize the patient preparation for surgery before their own physical needs. The pattern of late lunches and missed breaks provided leadership the data to ask for resources to support the workflow redesign. Dr. Watson's theory personalizes the caring human experience without bias and calls out the importance of honoring the nurse-patient connectedness by sharing experiences that impact the patient's healing journey (Watson, 2023). By integrating both an improvement change-management framework and a human caring framework, the team fostered a culture of safety and caring in the perioperative services department.

Methods

Context

According to CMS (2022), metrics related to Surgical Home Recovery (SHR) represent best practice. In this setting, these metrics were not being met. For example, nurses from

multiple settings across the care continuum voiced concerns regarding incomplete provider workups and gaps in care coordination including circumventing existing processes.

This organization performs over 500 surgical cases a month. It serves as one of the largest private employers in the Central San Joaquin Valley, with more than 2,300 employees and physicians (KP, 2023). System-wide improvements were anticipated to enhance the quality of communication, medical clearance for surgery, and care coordination of patients transitioning from outpatient clinics to the hospital perioperative services department. Clearly, an opportunity exists for improving both individual patient and organizational outcomes.

Interventions

The interventions for this project included multiple phases. The medical center has a joint forum to present ways to improve performance, customer service, and teamwork. This forum received a presentation pitch that included the multi-phasic process improvement focus areas: communication, teamwork, and care experience. A facility needs assessment was conducted between July – August 2021. This provided the current state of the facility’s knowledge of Team STEPPS foundations, identified the number of participants for training, and provided an opportunity to engage leadership in one shared vision and project (King et al., 2008).

The first phase was to recruit QI task force members that supported the planning and development. Taskforce members included the frontline staff, managers, and physician leads. A total of ten members participated in monthly meetings. Agenda planning was completed before the task force meeting, ensuring all content aligned with the organization's mission. The task force created a motto, “We can do better to help our patients feel better.”

Once the task force was established, the second phase assessed the current state of the workforce in surgical clinics. A hospital staff survey of staff, physicians, and medical group members was conducted to determine the number of participants for the bi-annual Team

STEPPS training. The survey questions included: “*Have you completed Team STEPPS training (yes or no); If yes, how long ago did you complete Team STEPPS training (less than one year, 1-2 years, 3-4 years, greater than four years); What is a Safety Stop (free text)?*” The three questions were sent via Survey Monkey and analyzed to coordinate training dates and times. Phase three included training based on survey findings. This next training was conducted in August and October of 2021. Team STEPPS created a common language, mindset, and aligned communication methods supporting *Safety Stops* (King et al., 2008).

Study of the Interventions

A simultaneous plan for existing staff (previously trained with Team STEPPS foundations who demonstrate the core behaviors) attended four weekly huddles throughout the facility where they communicated and educated their nurse colleagues regarding the definition of safety stops. The nursing QI task force developed a checklist of situations to call safety stops for surgical patients. After the four huddles, this checklist was presented to the physician’s medical group for input. Subsequently, this checklist was converted to an algorithm similar to the American Heart Association [AHA], 2020 basic life support form (AHA, 2020).

SWOT Analysis

A review of patients scheduled for elective surgery at one medical center from January 2021 through January 2022 highlighted the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis (Appendix E). Strengths included perioperative leadership vision alignment throughout the management team. The staff was committed to “*extraordinary care, every patient, every time*” (KP, 2023). Another strength was a highly committed workforce of subject matter experts. Weaknesses included the current workarounds for the PeriOperative Medicine (POM) clinic, as evidenced by ineffective communication, variation among physician practices that contributed to risk, and lack of standardization. Opportunities included the areas of risk to

the organization's reputation and care delivery for the preoperative patient care coordination. Other opportunities were safety and service risks when safety was overlooked to meet the organizational expectations, such as workarounds, last-minute add-on surgery cases, rushing patient preparation during preoperative assessment, and skipping closed-loop communication steps. Current threats to the organization were prioritizing quantity versus quality, resource limitations, and the POM clinic workflow.

GANTT Chart

The DNP project was conducted over 12 months. The approval for the project was obtained in January 2021 from the Perioperative Leadership Team and The Physician Medical Group Administration. The timeline included meeting dates for the stakeholders scheduled every month. Agreements were made for when a representative was available to join from each service line specialty department. The timeline was scheduled for planning, task force meetings, rounding with staff, and data meetings with the systems analyst administrator. Monthly meetings and daily safety briefings were conducted to report status updates. Timeline date changes were made for activities that were rescheduled. The total number of hours and dates were tracked on the project timeline. The GANTT chart (Appendix G) was shared with the group during the monthly meeting to plan the next test of change- Plan, Do, Study, Act [PDSA] cycle. Each proposed intervention included the Work Breakdown Structure details.

Work Breakdown Structure to Redesigning Surgical Pathway

Project Management Foundations by Biafore (2019) was presented to leadership to define activities, plan initiation of the project, and plan management. The Project Management Plan was presented to local leadership for project approval. The project charter (IHI, 2021) highlighted the extensive work required for avoidable pivot work. A steering committee was formed, and regular meetings were conducted frequently. Sessions were planned during office hours when the clinic

was closed from 12:30 -13:30. Location was booked in a neutral meeting zone. A neutral meeting zone was an area that was designed to eliminate hierarchy and power bias from both entities (Biafore, 2019). The invited stakeholder meeting included designees from Periop Management, Clinic Management, the Executive Sponsor, TPMG Physician Leader, and Administrative Support.

Communication Matrix

The communication matrix consisted of weekly meetings with DNP Chair and Committee Co-chair as needed. Additional support was provided using phone calls and text messages to keep lines of communication open. Bi-weekly team meetings with the QI task force were held to review the number of canceled cases. Chart reviews compared the case cancellations and postponements to determine if the safety checklist helped close the gap to meet medical clearance criteria. Interdisciplinary stakeholder meetings were scheduled after the biweekly QI team meetings to report on patient optimization. Additional information from the frontline teams to report huddle staff attendance were conducted. Defined activities were reviewed at a high regional organizational level and approved by Perioperative Leadership stakeholders, who agreed to be emailed. If senior leaders were unable to attend, a department designee participated in the steering committee activities to ensure adequate participation.

Process Map

The outpatient clinic visits started the medical clearance encounter. Patients were evaluated by their primary care clinic physician and referred to the surgical specialty clinic for consultation. A tentative surgical date was given to the patient to determine whether the patient wanted to have surgery to meet the patient-friendly surgery scheduling metric. Once the surgery was deemed necessary, the patient decided whether to proceed.

The surgery date was entered into the system. The surgery scheduler placed the information for the perioperative surgery scheduler to create the operating room schedule and blocked the time needed for the surgery case. The patient received a phone call from the POM Clinic physician to medically clear the patient for surgery. The history and physical review included assessing the patient's chart, labs, and medications. Ideally, physicians conducted telephone interviews, reviewed the patient history, ordered any pertinent labs, and answered medical questions that might have influenced the surgical outcomes.

Costs

The cost for this evidence-based change of practice project required three full-time Registered Nurses with an approximate annual salary of \$300,000 combined. Tracking the number of surgery cancellations each month provided feedback, data, and opportunities to modify actions included during the tests of change. Decreasing one DOS case cancellation demonstrated a minimum cost savings/avoidance of \$4,000 per patient procedure. Adding one full-time RN, Monday through Friday, to complete preop calls for every scheduled surgery eliminated all secure messaging previously sent. The average number of hours dedicated to the project was $8 \times 4 \text{ days} = 32 \text{ hours per week}$. The average RN made approximately $\$100/\text{hr.} \times 32 \text{ hrs.} = \3200 weekly . Tracking the number of DOS cancellations was reported monthly with documented reasons for cancellations by a 1.0 full-time RN (40 hours) $\times \$100 = \$4000/\text{week}$. The third additional 1.0 FTE RN scheduled all preop covid testing and conducted chart reviews (40 hours) $\times \$100 = \$4000/\text{week}$.

Budget Return on Investment (ROI) Cost Avoidance/Savings

The tool from Return on Investment [ROI] Institute (2023) provided an assessment by examining the financial outcomes data to help leadership make informed decisions to allocate resources that supported this project. During the planning process preceding the implementation

of improvement actions, projected ROI can be used to estimate how the planned intervention affects revenue and operating costs and to adjust the intervention to optimize quality and financial performance (S. Bressoud, personal communication, March 1, 2021). The practice tool used that was originally implemented by the ROI Institute (2023), showed how long it would take for an intervention to break even, and that is, for the returns of the practice improvement to offset the upfront and ongoing implementation costs.

Outcome Measures

This project focused on redesigning workflows that assessed the medical clearance process in perioperative services. Three outcomes were analyzed using system-generated reports: 1. calculation of the day of surgery cancellations rates; 2. outpatient care experience scores; 3. staff engagement metrics. The data were reviewed weekly from August 2021 to July 2022 by the QI team.

Analysis

This analysis was calculated using data from the literature. The project improvement team reviewed the details of cancellations for trends. Based on the 30-day preoperative medicine study (Terveen et al., 2022), the standardized clinic medical clearance tests saved \$22.7 million annually. In this project, the salaries for two full-time RNs = $\$8000/\text{week} \times 38 \text{ weeks} = \$304,000$ and 1 part-time RN = $\$3200 \times 40 \text{ weeks} = \$121,600$. The total of \$425,600 is the nursing workforce cost for the DNP project per year minus the cost avoidance calculated from surgical case cancellations per year (labs, ancillary services, etc...) equal approximately \$5,107,200/ year (Appendix J).

Ethical Considerations

The nurses' professional duty is to serve the community, advocate for high-quality care, keep patients safe from harm, and promote an ethical work environment (ANA, 2015). An

ethical dilemma exists for staff in healthcare systems when workarounds and other inefficiencies impact patient quality outcomes, a culture of safety, patient autonomy, and a spirit of beneficence. For example, the generational workforce divide can impact individuals aged 65 and older who may have trouble navigating new technology or complex fragmented healthcare systems. Providers must perform effective medical clearances especially with an aging population who may have many comorbidities for elective or emergent surgery. According to the review of the literature, government-incentivized programs require hospitals to collect quality metric performance data (CMS, 2022). Implementing a PreOp Safety One Stop Shop may lessen the ethical dilemmas faced by employees who are trying to minimize workarounds while maximizing productivity and quality outcomes in high-risk departments such as surgery.

University faculty determined that this project qualified as an evidence-based change in practice using the Institutional Review Board checklist and met exemption criteria (Appendix L). This project was reviewed by faculty, sponsors, and workgroup, who approved the dedicated improvement effort listed in the letter of support (Appendix L). Across settings, implementing the DNP Essentials (AACN, 2023) may influence future nursing practice and guide ethical project planning and dissemination to bridge the gaps between research and practice.

Prior to project implementation, ethical aspects of implementing and studying the intervention(s) and how they were addressed included formal organizational ethics review and potential conflict(s) of interest. Consultation with the ethics committee highlighted the need for cultural considerations and diversity within the targeted adult surgical population. Annual Compliance education was completed by 100% of the staff participating in developing and implementing the Preop One Stop Shop project, and language assistance resources were utilized as needed.

The Jesuit value of “Cura Personalis,” or “care of the person,” aligns with the daily practice of nursing values (Tom, 2019). Being the change agent within this practice setting provides opportunities to demonstrate the courage to form a more substantial cohort of the professional nursing practice community within the department. This author believes in changing the world from here, which aligns with organizational values. It was an honor to be a part of a collective workforce of seasoned healthcare providers with robust integration of a care delivery model guided by the Caring Science Theoretical framework (Watson, 2023) and a shared vision that aligns with the author’s personal convictions and professional values.

Results

The project data collection plan included quantitative and qualitative analysis. Quantitative data from existing automated crystal reports were system-generated weekly reports from the electronic medical record system. This data set was exported to Microsoft Excel and placed on display, establishing the baseline to compare daily performance. Components included defects related to on-time surgery start times and surgery delays/cancellations. Process outcome measures used the chart review indicators to identify and anonymize patient charts as “not ready” linked to “reasons for cancellation” or “case postponed.” This nurse-led POSS project decreased the number of same-day surgical cancellations from 10% to 3%, improved the standardized patient care experience measures from 78% to 79%, and increased internal staff engagement scores from 72% to 77% by July 2022.

Evolution of the Interventions

The compliance audits of the annual Team STEPPS training toolkit components were conducted to evaluate the standardized communication and pathway algorithms (King et al., 2008). Operational process interventions, including safety stops, briefings, and huddles brought information across the frontlines, back up the chain of command to communicate workflow

redesign changes needed and emphasized opportunities to call out gaps in quality and safety. Biweekly face-to-face follow-up meetings provided an additional forum to identify and discuss barriers, changes, or to escalate priority patient situations. This project collaboration resulted in the standardized checklist ultimately being incorporated into a new surgical workflow redesign that promotes reliable and consistent medical clearance for surgical patients.

Discussion

Technology has changed the healthcare operations by keeping communication options viable despite social distancing (Mars et al., 2018). The study by Kaplan (2020) discussed the importance of telemedicine while expanding on the familiar issues of physician-patient relationships and quality of care, consent, access, and privacy. The association between Kaplan's interventions and outcomes represent key findings in this DNP project as evidenced by the decrease in surgery cancellations. This outcome was more visible in March 2021 through February 2022 (Appendix I) and mostly likely attributed to fewer surgeries associated with COVID-19 delta variant, winter surge, and mandated booster vaccine. The timing between Kaplan's (2020) telemedicine study and this DNP project (2021-2022) offered the new opportunity to integrate Kaplan's findings and influence workflow redesign in this setting.

The impact of this DNP project demonstrated the strength in the voice of nursing and the *Speak Up* culture (AHRQ, 2019). The preop phone call outreach interventions included in the workflow redesign highlighted the limited focus on telemedicine's legal, ethical, and regulatory issues. The scripting of the preop phone call was developed to maintain the boundaries of Health Insurance Portability and Accountability Act of 1996 (HIPAA) (<https://www.cdc.gov/phlp/publications/topic/hipaa.html>). The script standardization of phone calls and preop checklist intake conducted within 48 hours of scheduled surgery improved

workflow efficiency. This process improvement brought new levels of performance expectations for all staff assigned to the patient optimization medical clearance workflow.

Summary

Providers must perform timely and accurate medical clearances especially with an aging population requiring elective surgeries. Surgical cancellations can occur due to ineffective and inefficient operational procedures which lead to suboptimal patient experience and financial outcomes. Prioritizing patient care needs across the healthcare continuum necessitates innovative Informatics Technology (IT) and Quality Improvement (QI) strategies. This evidence-based change in practice project led to a PreOp One Stop Shop (POSS) safe surgery intervention which created value in this organization by decreasing the number of same-day surgical cancellations, increasing staff satisfaction scores, and improving patient care experience metrics. CMS (2022) uses value-based purchasing programs tied to financial incentives that pay for hospitals' performance on key core measures, including patient satisfaction ratings and communication about surgical medical clearance. In summary, the POSS intervention including a standardized checklist is recommended for pre-surgical assessment to expedite medical clearance. This new approach can create a win-win opportunity to optimize both patient and organizational outcomes.

Limitations

Before the COVID-19 pandemic, preoperative telephone visits were conducted daily, with one to two surgery cases identified per week that were missing patient optimization; however, comparative data for this project was limited post COVID-19. During this project, the top three reasons for surgical case cancellations related to patients missing medical clearance included: 1. lack of POM clinic physician appointments, 2. missing lab results, and 3. cardiac clearance tests not performed. Therefore, this project was limited to the post-COVID-19 surge that increased demand for surgical procedures. During the analysis of this macrosystem level

project, there were changes in senior leadership and five positions in middle management roles were vacated. Despite these limiting factors that would ideally promote consistent leadership and management, the professionalism, mutual support, hospital physician collaboration, and strong working relationships were maintained.

Conclusion

According to TJC, *Leading the Way to Zero* (TJC, 2023) requires a leadership team and an evolving culture that demonstrates utilization of process improvement tools and methodologies that promote accountability for patient safety and quality. This evidence-based change project has transformed surgical care operations to improve patient safety for preoperative medical clearance by integrating a nurse-led PreOp One Stop Shop.

The post implementation surveys provided team feedback and additional momentum to further disseminate project success factors. These factors include Team STEPPS training, safety stop interventions, and peer promotion of a “Speak Up” culture (AHRQ, 2019). Although the workflow redesign for a POSS did not require additional new resources, it did provide new ways of thinking and organizing with existing resources to minimize surgical risk and maximize patient safety. Future research and improvement initiatives are needed to continually innovate and integrate new technologies and evidence within and across healthcare systems. In conclusion, introducing a POSS approach can generate staff engagement, creativity, and better teamwork to optimize individual and organizational outcomes.

Other Information

I want to thank and acknowledge my DNP committee chairperson, Dr. Maxworthy, for the unwavering support and guidance during the moments I needed it the most. I would like to also express my sincere gratitude for my other committee member, Dr. Coleman, for the invaluable insight, patience, time, and feedback that she gave throughout my career. I also want

to thank my family for the unconditional love and faith in me. I want to thank my USF Cohort, faculty, perioperative team, and colleagues at Kaiser Permanente for their support that made this DNP project possible.

References

- Agency for Healthcare Research and Quality [AHRQ, 2019]. Team STEPPS 2.0 Course Management. <https://www.ahrq.gov/teamstepps/instructor/essentials/coursemgmt.html>
- Aliabadi, A., Langarizadeh, M., & Moghbeli, F. (2017). Application of ethics for providing telemedicine services and information technology. *Medical archives (Sarajevo, Bosnia and Herzegovina)*, 71(5), 351–355. <https://doi.org/10.5455/medarh.2017.71.351-355>
- Al Talalwah, N., & McIltrout, K. H. (2019). Cancellation of surgeries: Integrative review. *Journal of Perianesthesia Nursing*, 34(1), 86- 96. <https://doi.org/10.1016/j.jopan.2017.09.012>
- American Association of Colleges of Nursing [AACN]. (2023). AACN position statement on the practice doctorate in nursing. <https://www.aacnnursing.org/DNP/Position-Statement>
- American Heart Association [AHA]. (2023). *Algorithms*. <https://cpr.heart.org/en/resuscitation-science/cpr-and-ecc-guidelines/algorithms>
- American Nurses Association [ANA]. (2015). Code of ethics for nurses with interpretive statements. <https://www.nursingworld.org/practice-policy/nursing-excellence/ethics/code-of-ethics-for-nurses/coe-view-only/>
- Barsuk, J. (2018). Health care simulation to advance safety: The role of simulation in preparedness. *Agency for Healthcare Research and Quality*. <https://www.ahrq.gov/research/findings/factsheets/errors-safety/simulproj15/index.html>
- Best, M. J., McFarland, E. G., Anderson, G. F., & Srikumaran, U. (2020). The likely economic impact of fewer elective surgical procedures on US hospitals during the COVID-19 pandemic. *Surgery*, 168(5), 962–967. <https://doi.org/10.1016/j.surg.2020.07.014>
- Biafore, B. (2019). Project Management Foundations [Video File]. LinkedIn.

https://www.linkedin.com/learning/project-management-foundations-4?trk=share_ios_course_learning&shareId=kWaUL355SdmCjCgOQCyvDQ==

Brady, J. (2022). *Making healthcare safer III: A critical analysis of existing and emerging patient safety practices*, 3(1). Agency for Healthcare Research and Quality.

<https://www.ahrq.gov/research/findings/making-healthcare-safer/mhs3/index.html>

<https://doi.org/10.7759/cureus.20607>

Centers for Medicare & Medicaid Services [CMS]. (2022). *Outpatient and ambulatory surgery*

CAHPS (OAS CAHPS). [https://www.cms.gov/research-statistics-data-and-](https://www.cms.gov/research-statistics-data-and-systems/research/cahps/oas-cahps)

[systems/research/cahps/oas-cahps](https://www.cms.gov/research-statistics-data-and-systems/research/cahps/oas-cahps)

Chaturvedi, R., Patel, K., Burton, B. N., & Gabriel, R. A. (2021). Geriatric Patients Undergoing Outpatient Surgery in the United States: A Retrospective Cohort Analysis on the Rates of Hospital Admission and Complications. *Cureus*, 13(12), e20607.

Childers, C. P., Dworsky, J. Q., Russell, M. M., Maggard-Gibbons, M. (2019). Comparison of cost center-specific vs. hospital-wide cost-to-charge ratios for operating room services at various hospital types. *JAMA Surgery* 153(4), 557-558.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6584708/>

Colquhoun, D. A., Shanks, A. M., Kapeles, S. R., Shah, N., Saager, L., Vaughn, M. T., Buehler, K., Burns, M. L., Tremper, K. K., Freundlich, R. E., Aziz, M., Kheterpal, S., & Mathis, M. R. (2020). Considerations for integrating perioperative electronic health records across institutions for research and quality improvement: The approach taken by the multicenter perioperative outcomes group. *Anesthesia and Analgesia*, 130(5), 1133–1146.

<https://doi.org/10.1213/ANE.0000000000004489>

Dang, D., Dearholt, S., Bissett, K., Ascenzi, J., & Whalen, M. (2022). *Johns Hopkins evidence-based practice for nurses and healthcare professionals: Model and guidelines*. 4th ed.

Sigma Theta Tau International

Eyrich, N. W., Andino, J. J., & Fessell, D. P. (2021). Bridging the digital divide to avoid leaving the most vulnerable behind. *JAMA Surgery*, *156*(8), 703–704.

<https://doi.org/10.1001/jamasurg.2021.1143>

Fayed, A., Elkouny, A., Wahabi, H., & Zoughaibi, N. (2016). Elective surgery cancelation on day of surgery: An endless dilemma. *Saudi Journal of Anaesthesia*, *10*(1), 68-73.

<https://www.saudija.org/text.asp?2016/10/1/68/169479>

Foss-Durant, A. M. (2014). Science of human caring. *Global Advances in Health and Medicine*, *3*(1). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3923286/>

Ghaferi, A. A., Birkmeyer, J. D., & Dimick, J. B. (2009). Variation in hospital mortality associated with inpatient surgery. *New England Journal of Medicine*; *361*(14), 1368–75.

<https://pubmed.ncbi.nlm.nih.gov/19797283/>

Grocott M. P. (2019). Pathway redesign: putting patients ahead of professionals. *Clinical Medicine Journal*, *19*(6), 468–472. <https://doi.org/10.7861/clinmed.2019-0292>

Haugen, A. S., Sjøfteland, E., Almeland, S. K., Sevdalis, N., Vonen, B. E., Geir E. Nortvedt, & M., Harthug, S. (2015). Effect of the world health organization checklist on patient outcomes: A stepped wedge cluster randomized controlled trial. *Annals of Surgery*. *261*(5). 821-828,

https://journals.lww.com/annalsofsurgery/FullText/2015/05000/Effect_of_the_World_Health_Organization_Checklist.1.aspx

Institute for Healthcare Improvement [IHI]. (2021). *IHI's QI Essentials Toolkit* [video file]

<https://youtu.be/r-3jveJ-uBA>

Jain, D., Sharma, R., & Reddy, S. (2018). WHO safe surgery checklist: Barriers to universal acceptance. *Journal of Anaesthesiology, Clinical Pharmacology*, *34*(1), 7–10.

- Kain, Z. N., Vakharia, S., Garson, L., Engwall, S., Schwarzkopf, R., Gupta, R., & Cannesson, M. (2014). The perioperative surgical home as a future perioperative practice model, *Anesthesia & Analgesia*, 5(118) 1126-1130.
<https://doi.org/10.1213/ANE.0000000000000190>
- Kaiser Permanente [KP]. (2023). *Patient safety: Promoting a culture of safe care*.
<https://healthy.kaiserpermanente.org/pages/quality-safety/patient-safety>
- Kamdar, N. V., Huverserian, A., Jalilian, L., Thi, W., Duval, V., Beck, L., Brooker, L., Grogan, T., Lin, A., & Cannesson, M. (2020). Development, implementation, and evaluation of a telemedicine preoperative evaluation initiative at a major academic medical center. *Anesthesia and Analgesia*, 131(6), 1647–1656.
<https://doi.org/10.1213/ANE.00000000000005208>
- Kaplan, B. (2020). Revisiting health information technology ethical, legal, and social issues and evaluation: Telehealth/ telemedicine. *International Journal of Medical Informatics*, (143).
<https://doi.org/10.1016/j.ijmedinf.2020.104239>
- Keränen, J., & Keränen, U. (2011). From home to operation (FHTO): A new surgical admission center: Does the comprehensive initialization of a new process harm surgery outcome? *Scandinavian Journal of Surgery*, 100(2), 136–140.
<https://doi.org/10.1177/1457496911110000213>
- Keränen, J., Soini, E. J., Ryyänen, O. P., Hietaniemi, K., & Keränen, U. (2007). Economic evaluation comparing from home to operation same-day admission and preoperative admission one day prior to the surgery process: A randomized, controlled trial of laparoscopic cholecystectomy. *Current Medical Research and Opinion*, 23(11), 2775–2784. <https://doi.org/10.1185/030079907x233223>

- King H.B., Battles J., Baker D.P., et al., (2008). TeamSTEPPS™: Team strategies and tools to enhance performance and patient Safety. *Agency for Healthcare Research and Quality*, (3). <https://www.ncbi.nlm.nih.gov/books/NBK43686/>
- Kwon M. A. (2018). Perioperative surgical home: a new scope for future anesthesiology. *Korean Journal of Anesthesiology*, 71(3), 175–181. <https://doi.org/10.4097/kja.d.18.27182>
- Ljungqvist, O., Scott, M., & Fearon, K. C. (2017). Enhanced recovery after surgery: A Review. *JAMA surgery*, 152(3), 292–298. <https://jamanetwork.com/journals/jamasurgery/article-abstract/2595921>
- Loodin, A. & Hommel, A. (2021). The effects of preoperative oral carbohydrate drinks on energy intake and postoperative complications after hip fracture surgery: A pilot study. *International Journal of Orthopedic and Trauma Nursing*.(41) <https://doi.org/10.1016/j.ijotn.2020.100834>.
- Makary, M. A., Sexton, B. J., Freischlag, J. A. Millman, E. A.; Pryor, D., Holzmueller, C., Pronovost, P. J., & Dagger. (2006). Patient safety in surgery. *Annals of Surgery*, 243(5). 628-635. <https://doi.org/10.1097/01.sla.0000216410.74062.0f>
- Maragakis, L. (2020). Coronavirus second wave, third wave and beyond: What causes a COVID Surge. *Johns Hopkins Medicine*. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/first-and-second-waves-of-coronavirus>
- Mars, M., Morris, C., & Scott, R. E. (2018). Selfie telemedicine - what are the legal and regulatory issues. *Studies in health technology and informatics*, 254. 53–62. <https://pubmed.ncbi.nlm.nih.gov/30306957/>
- Martin L., Berry W., Mate K. (2020). How to safely restart elective surgeries after a covid

spike. *Harvard Business Review*. <https://hbr.org/2020/11/how-to-safely-restart-elective-surgeries-after-a-covid-spike>

Meng, J., Sun, T., Zhang, F3, Qin, S., Li, Y., Zhao H. (2018). Deep surgical site infection after ankle fractures treated by open reduction and internal fixation in adults: a retrospective case-control study. *International Wound Journal*, 15(6). 1-15. <https://pubmed.ncbi.nlm.nih.gov/30091528/>

Mullen, A., Wieland, H. J., Wieser, E. S., Spannhake, E. W., & Marinos, R. S. (2017). Perioperative participation of orthopedic patients and surgical staff in a nasal decolonization intervention to reduce *Staphylococcus* spp surgical site infections. *American Journal of Infection Control*. 45. 554-556. <https://ajicjournal.org/retrieve/pii/S0196655317300068>

National Quality Forum [NQF]. (2023). *List of serious reportable events (aka SRE or "Never Events")*. https://www.qualityforum.org/Topics/SREs/List_of_SREs.aspx

Nicholson, T., Maltenfort, M., Getz, C., Lazarus, M., Williams, G., & Namdari, S. (2018). Multimodal Pain Management Protocol Versus Patient Controlled Narcotic Analgesia for Postoperative Pain Control after Shoulder Arthroplasty. *The archives of bone and joint surgery*, 6(3), 196–202. <https://pubmed.ncbi.nlm.nih.gov/29911136/>

Rathnayake, D., Clarke, M., & Jayasinghe, V. (2021). Patient prioritisation methods to shorten waiting times for elective surgery: A systematic review of how to improve access to surgery. *PloS One*, 16(8). <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0256578>

Return on Investment Institute [ROI] (2023). *Responding to the challenge*. <https://roiinstitute.net/healthcare/>

Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J.,

Roberts, P. R., & Thomas, E. J. (2006). The safety attitudes questionnaire: psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, 6(1). <https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-6-44>

Terveen, D., Berdahl, J., Dhariwal, M., & Meng, Q. (2022). Real-world cataract surgery complications and secondary interventions incidence rates: An analysis of US Medicare claims database analysis. *Journal of Ophthalmology*.

<https://www.hindawi.com/journals/joph/2022/8653476/>

The Joint Commission [TJC]. (2023). *Resources: Leading the way to zero resources*.

<https://www.jointcommission.org/resources/patient-safety-topics/zero-harm/leading-the-way-to-zero-resources/>

Tom, M. (2015). *About USF - Who we are - Our values*. University of San Francisco. <https://www.usfca.edu/about-usf/who-we-are/our-values>

Turunen, E., Miettinen, M., Setälä, L., & Vehviläinen-Julkunen, K. (2018).

The financial cost of an elective day of surgery cancellations. *Journal of Hospital Administration*. <http://doi:7.30.10.5430/jha.v7n6p30>.

Vacheron, C. H., Acker, A., Autran, M., Fuz, F., Piriou, V., Friggeri, A., & Theissen, A. (2023).

Insurance claims for wrong-side, wrong-organ, wrong-procedure, or wrong-person surgical errors: A retrospective study for 10 years. *Journal of patient safety*, 19(1), 13-17. <https://doi.org/10.1097/PTS.0000000000001080>

Vardell, E. & Malloy, M. (2013) Joanna Briggs Institute: An evidence-based practice database, *Medical Reference Services Quarterly*, 32(4), 434-442,

<https://doi.org/10.1080/02763869.2013.837734>

Wallace, L., Muir, M., Romano, L., Wyllie, T., Gyomber, D., & Hodgson, R. (2021). Assessing

operating theatre efficiency: a prospective cohort study to identify intervention targets to improve efficiency, *ANZ Journal of Surgery*,

<https://onlinelibrary.wiley.com/doi/10.1111/ans.16991>

Watson, J. (2023). *Watson's caring science & human caring theory: 10 caritas processes*.

Watson Caring Science Institute. <https://www.watsoncaringscience.org/jean-bio/caring-science-theory/>

Webster, J., & Osborne, S. (2015). Preoperative bathing or showering with skin antiseptics to prevent surgical site infection. *The Cochrane database of systematic reviews*, (2),

CD004985. <https://doi.org/10.1002/14651858.CD004985.pub5>

Wilson, M. A., Sinno, M., Hacker Teper, M., Courtney, K., Nuseir, D., Schonewille, A.,

Rauchwerger, D., & Taher, A. (2022). Toward zero harm: Mackenzie Health's journey toward becoming a high reliability organization and eliminating avoidable harm. *Journal of Patient Safety*, 18 (7), 680–685. <https://doi.org/10.1097/PTS.0000000000000978>

Wright, S., Wiechula, R., & McLiesh, P. (2016). The effectiveness of prehabilitation for adults

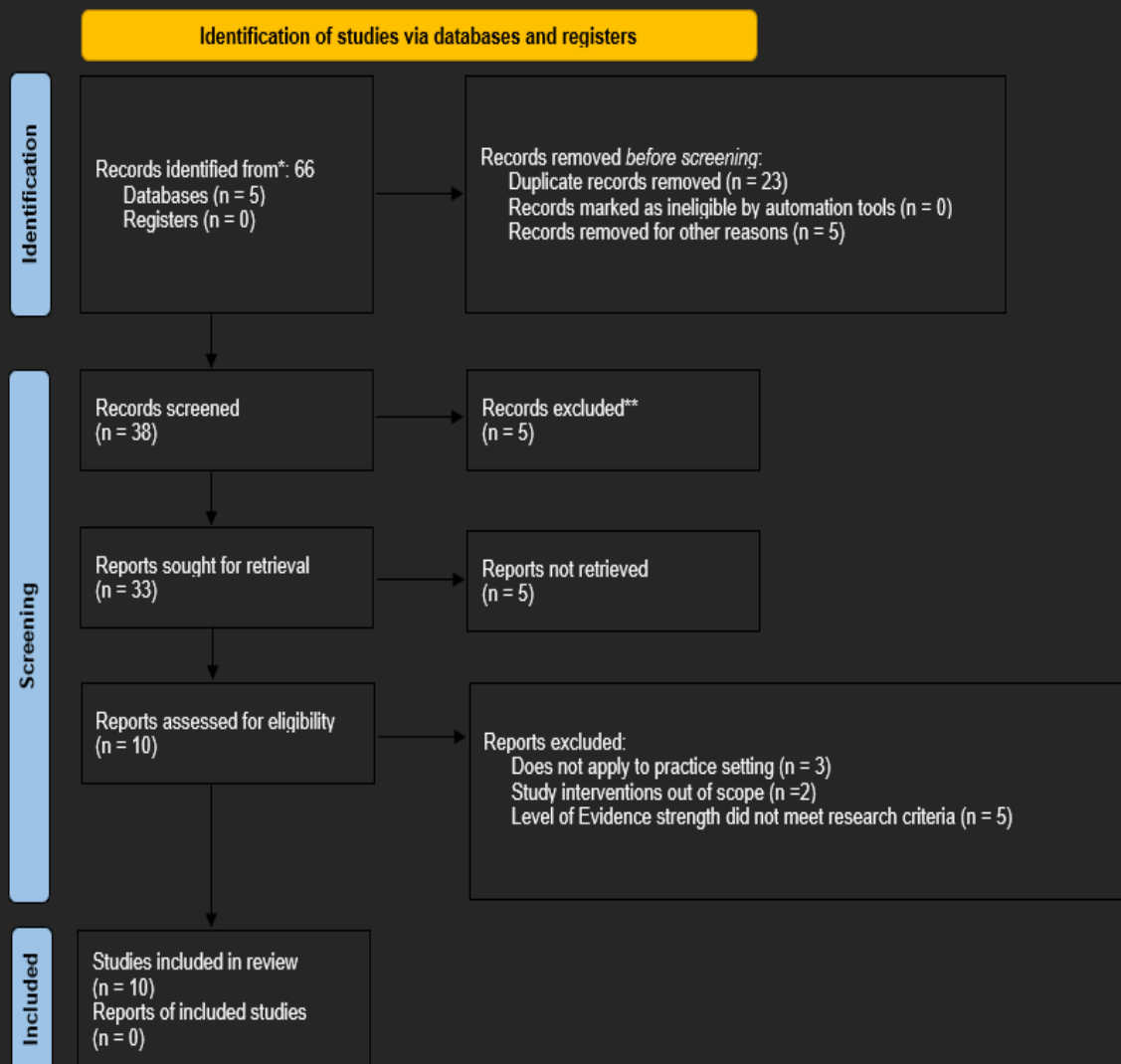
having elective surgery: A systematic review protocol. *JBIR database of systematic reviews and implementation reports*, 14(2), 78–92. [https://doi.org/10.11124/jbisrir-2016-](https://doi.org/10.11124/jbisrir-2016-2460)

[2460](https://doi.org/10.11124/jbisrir-2016-2460)

Appendices

Appendix A. PRISMA

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

Appendix B.
Evidence Evaluation Table

Evaluation Table

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Childers, C.P., Dworsky, J.Q., Russell, M.M., Maggard-Gibbons, M. (2019). Comparison of cost center-specific vs. hospital-wide cost-to-charge ratios for operating room services at various hospital types. <i>JAMA Surg.</i> 154(6):557–558. doi:10.1001/jamasurg.2019.0146							
<p>Purpose: To evaluate hospital cost-to-charge ratios for operating room services and if there is variation by hospital type.</p>	<p>Design: Quantitative Comparative Study</p> <p>Method: Retrospective Comparison of Cost-to-charge ratios in various settings</p> <p>Conceptual Framework: Ethical Utilitarian Framework to guide equitable cost reporting</p>	<p>Sample: N= 289</p> <p>Setting: -Hospitals -Ambulatory Surgery Centers</p> <p>- Government (n=44) -For-profit (n=73) -Not-for-profit (n=172)</p>	<p>IV: Method in calculating the Median (Interquartile Range) CCR</p> <p>DV: CCRs for California Hospitals in Fiscal Year 2015</p> <p>Deviation from Hospital CCR by hospital type</p>	<p>Major variables measured were the cost and expense in dollars</p> <p>Direct Costs of Surgery and recovery cost center</p> <p>Salaries Supplies</p> <p>Indirect costs of managing the operating room and recovery room</p>	<p>Comparisons between the Hospital-wide CCR and cost Center-specific CCR had a P value <.001 using the Wilcoxon-Matched pairs signed rank test</p> <p>P values were generated using Wilcoxon rank sum and Kruskal-Wallis equality of populations rank test</p>	<p>Mean hospital charges were 4 times higher than hospital costs</p> <p>Median surgery CCRs are similar at teaching and nonteaching hospitals (0.21 [IQR, 0.16 to 0.33]</p> <p>Government-owned facilities 0.19 [IQR, 0.13 to 0.25]; P = .12) (0.26 [IQR,0.22 to0.40])</p> <p>Not-for-profit (0.19 [IQR, 0.14 to 0.24])</p> <p>For-profit facilities (0.16 [IQR, 0.11 to 0.22]) (P < .001)</p>	<p>JHNEBP Level of evidence (LOE): III A</p> <p>Worth to practice: This study demonstrates the importance of cost variable standardization when redesigning the prep process. This cautions organizations to look at how the calculations were made before conducting test of change. These may not be applicable to setting.</p> <p>Strengths: Use of cost center CCRs ratios quantify estimates compared with hospital CCRs.</p> <p>Weaknesses: Time driven activity-based costing is a method that is actionable rather than generalizable</p> <p>Feasibility: Info will be used when ranking project facility CCRs</p> <p>Conclusion(s): Agree with authors' conclusion that suggest value of measures of surgical care costs. These results are generalizable.</p> <p>Recommendation(s): Research findings will be used in DNP project to report and compare CCRs</p>

Abbreviations: CCR, cost-to-charge ratio; Calculated as $([\text{cost center-specific CCR} - \text{hospital-wide CCR}]/\text{hospital-wide CCR})$. P values were generated using Wilcoxon rank sum and Kruskal-Wallis equality of populations rank tests. Includes state-, city-, and district-owned facilities

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Colquhoun, D. A., Shanks, A. M., Kapeles, S. R., Shah, N., Saager, L., Vaughn, M. T., Buehler, K., Burns, M. L., Tremper, K. K., Freundlich, R. E., Aziz, M., Kheterpal, S., & Mathis, M. R. (2020). Considerations for integration of Perioperative electronic health records across institutions for research and quality improvement: The approach taken by the multicenter perioperative outcomes group. <i>Anesthesia and Analgesia</i> , 130(5), 1133–1146. https://doi.org/10.1213/ANE.0000000000004489							
Purpose: To build a single standardized repository platform integrating perioperative Electronic Health Records (EHR) from the national databases using standardized methodology	Design: Quasi-experimental Study Method: Rigorous validation mapping process Conceptual Framework: MPOG Concept mapping utility	Sample: Two National Databases: National Surgical Quality Improvement Project [NSQIP] Society of Thoracic Surgeons General Thoracic Surgery Database [STS-GTSD]) Setting: Multicenter Perioperative Hospitals	IV: Methodology to generate standardized phenotypes to generate data that can be pulled DV: Creation of single repository platform that pulls EHR from National Database Reporting System	Platform creation using Centralized database -Data Diagnostics tool facilitates assessment identifying specific deficiencies across data category, institution, time domains and Coordinating Center: Automated Handling DV: Demographic Data (EHR) -Preoperative information -ASA PS classification -History & physical -Home meds, Case times -Fluid inputs & outputs -Medications given -Observation/ procedure -Vital signs -Hospital codes/Fees	Prespecified, standardized methodologies (ontologies) to define a specific patient feature, aspect of care, or outcome. US Census Bureau Systematized Nomenclature of Medicine (SNOMED) dictionary to identify health care terminology	Platform built for gathering of detailed, structured/ standardized data regarding perioperative care across many institutions could transitioned into one mechanism for performing prospective clinical trials	JHNEBP Level of evidence (LOE): II A Worth to practice: Provides one repository to pull data to compare national practices Strengths: Clinician engagement, Standardized understanding of clinical context data quality. Weaknesses: Risk of implicit bias selection non-paper-based systems Feasibility: This is currently being utilized in my practice setting and will be feasible throughout the development of the one stop shop in periop Conclusion(s): MPOG has developed a framework for appending additional information to the standard data extract Recommendation(s): Research will be used in DNP project to integrate into practice setting to redesign preop process

Abbreviations: AACD (Association of Anesthesia Clinical Directors); AIMS (Anesthesia Information Management Systems); EHR (electronic health record); ICD-10 (international Classification of Diseases, Tenth Revision); IMPACT (Initiative for Multicenter Pragmatic, Anesthesiology Clinical Trials); IRB (Institutional review board); MPOG (Multicenter Perioperative Outcomes Group); NSQIP (National Surgical Quality Improvement Project); PACU (postanesthesia care unit); PCRC (Perioperative Clinical Research

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Eyrych, N., Andino, J., Fessell, D. (2021). Bridging the digital divide to avoid leaving the most vulnerable behind. <i>JAMA Surg.</i> 2(1). https://doi.org/10.1001/jamasurg.2021.1143							
Purpose: To improve access to digital resources	Design: Quasi-experimental Cohort Study Method: Survey conducted; inquiry focused on access to digital devices -1 to 2 weeks prior to the appointment Standardize instructions on technology, connectivity Conceptual Model: Rapid Innovation Model	Sample 600,000 Medicare participants Setting: Veterans Affairs Hospital accepted government funding at a Michigan facility	IV: Access to digital resources: iPads, Wi-Fi, and cell phones DV: Number of patients utilizing digital resources provided	The reimbursement costs were being measured between private organization and public Number of participations that used the digital devices	This study demonstrated how joint efforts to create an innovation reimbursement Telehealth has been one of the greatest barriers to use in the past,	Patient engagement system, which includes templated instructions, anticipatory guidance, and opportunity to conduct video visit Standardized instructions on technology, connectivity closed communication gaps	JHNEBP Level of evidence (LOE): II A Worth To Practice: This study removed obstacles by incentivizing virtual visits, preventive care, and other cost-effective models Strengths: Large sample size, generalizable, provides framework to establish access for all preop surgical candidates Weakness: Cost upfront to invest in digital resources and reimbursement plans differ in current project site Feasibility: Implementation is feasible to center preop optimization in patient home setting within resources Conclusion(s): This study removes barriers and creates a process to access healthcare by digital device. This is the direction we experienced through pandemic. Recommendation(s): This study supports a method to connect patients with physicians by expanding telephone visits and combining video capability

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Kain, Z. Vakharia, S., Garson, L., Engwall, S., Schwarzkopf, R., Gupta, R., Cannesson, M. (2014). The perioperative surgical home as a future perioperative practice model. <i>Anesthesia & Analgesia</i> : 5(118) 1126-1130 doi: 10.1213/ANE.0000000000000190							
Purpose: To reduce variability in perioperative care	Design: Quasi-experimental Study Method: Comparative Effectiveness Research Conceptual Model: Practice model for perioperative care	Sample: N= 20 Surgeons Setting: UC Irvine Health	IV: Perioperative Surgical Home DV: Hospital costs Surgeon feedback	Patient care experience feedback was used to survey patients. The time patient spent in recovery	PSH did not replace Surgeon's role in the postoperative period Standardized protocols established scope adherence Mutually agreed on recovery protocols Manage medical issue during the episode of care Training provided efficiency focused mindset and approach	ERAS generates a net savings of over \$630 million/year Comparative Effectiveness Research Methodology used to gain the support of implementation for spreading PSH -Perioperative standardized	JHNEBP Level of evidence (LOE): II A Worth To Practice: Study supported the primary interventions for evidence-based project Strengths: Identifies multidisciplinary scopes, Transitioned standardization of care, integration of best practices with supporting evidence Weakness: Study did not include specific data for the readmission rate, length of stay hours in PACU, or infection rates. Feasibility: Implementation is feasible to Surgical Services within project scope. This requires phase roll out with Surgeon and KP Hospital Based Physicians Conclusion(s): Shared decision-making care model shifted throughout medical center Recommendation(s): Need to explore Toolkit for spreading practices and an algorithm in the Electronic Medical Record for clinical decision

Abbreviations: ERAS (Enhanced Recovery After Surgery); Perioperative Surgical Home (PSH); University of California (UC)

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Kamdar, Nirav V. Huverserian, A., Jalilian, L., Thi, D., Victor, Beck, L., Brooker, L., Grogan, T., Lin, A., Cannesson, M. (2020). Development, implementation, and evaluation of a telemedicine preoperative evaluation initiative at a major academic medical center. <i>Anesthesia & Analgesia</i> , 131(6). https://doi:10.1213/ANE.0000000000001370							
Purpose: To describe telemedicine -based anesthesia preoperative evaluation and report the program findings	Design: Quantitative Descriptive Study Method: Retrospective non-randomized study analysis telemedicine and in-person cohorts Conceptual Model: Integration of Technology to establish Telemedicine Program	Sample: N= 419 scheduled telemedicine visits N = 1785 in-person visit Included demographic characteristics for patients who had telemedicine encounter for Video visit and in-person Setting: Large metropolitan area (Los Angeles, CA).	IV: Telemedicine visits DV: -Patient satisfaction score, -Case Cancellation Rate -Patient cost savings	Patient satisfaction scores- Case cancellations totals were tallied monthly	Likert scoring system- 11 questions 5 points Information was gathered from patient level data from Epic MyChart Digital extraction method from UCLA's DataMart	Telemedicine program may be an effective and appropriate substitute for face-to-face PEPC visits in an urban metropolitan area, Telemedicine as a capstone technology and platform Anesthesiologists can use telemedicine safely, efficiently, and with high patient satisfaction with savings benefits within metropolitan areas for patients geographically near but temporally far from healthcare institutions	JHNEBP Level of evidence (LOE): II A Worth To Practice: Data supports integration of technology and opportunity to implement for areas with limited access to preop. Strengths: Increases access for all preop surgical candidates Weakness: Monetary compensation may influence patient participation Study did not rate quality assessments Feasibility: Implementation is feasible to all patients not only the those who are located geographically farther from medical center Conclusion(s): The best practice study concluded an efficient way to perform preop assessments Recommendation(s): This study needs to be comparted to new phenomenon- From Home to Operating Room

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Keränen, J., & Keränen, U. (2011). From Home To Operation (FHTO)- a new surgical admission center: does the comprehensive initialization of a new process harm surgery outcome? Scandinavian journal of surgery: SJS: official organ for the Finnish Surgical Society and the Scandinavian Surgical Society, 100(2), 136–140. https://doi.org/10.1177/145749691110000213							
Purpose: To investigate the extensive FHTO process transition effects patients' operation outcome patient	Design: Comparative Qualitative Research Study Method: Data was collected of all elective surgical patients between March and May in 2006 and in 2007, six months before and after the new FHTO center was opened. Conceptual Model: Process improvement model	Sample: N= Overall 1206 patients Setting: 2 nd Hospital with FHTO process opening in Finland Hyvinkää Hospital	IV: Patients admitted through old limited FHTO unit versus Patients process when patients walk directly into OR DV: Examine the patient outcomes of patients that participate in the FHTO	1206 patients were included, 592 in 2006 and 614 in 2007. -One-month postoperative follow-up was recorded -Two deaths were recorded during postoperative follow-up each year.	Before the extensive process change in 2006 54% of patients were admitted through old limited FHTO unit, and 46% through surgical ward. Six months after FHTO center opening in 2007 same figures were 90.5% and 9.5% Baseline statistics differed statistically in kidney failure, that increased in 2007	FHTO process transition included different surgical specialties. No reported negative impact to perioperative process Preoperative process should be debated thoroughly in every public hospital. The preoperative process transition from preoperative hospital stay to same day admission through new center can be accomplished without harming surgery outcome.	JHNEBP Level of evidence (LOE): LII A Worth To Practice: Data supports extending preop optimization beyond the walls of preop space in hospital. Strengths: Increases access for all preop surgical candidates Weakness: New phenomenon in the periop domain site. Design of reimbursement differs from current project site Feasibility: Implementation is feasible to center preop optimization in patient home setting within resources Conclusion(s): I will include this design in gaining support from stakeholders. Recommendation(s): This is a new phenomenon to perform preoperative optimization from Multidisciplinary approach

Abbreviations: From Home to Operation (FHTO)

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Keränen, J., Soini, E. J., Ryyänen, O. P., Hietaniemi, K., & Keränen, U. (2007). Economic evaluation comparing From Home to Operation same day admission and preoperative admission one day prior to the surgery process: a randomized, controlled trial of laparoscopic cholecystectomy. <i>Current medical research and opinion</i> , 23(11), 2775–2784. https://doi.org/10.1185/030079907x233223							
<p>Purpose: To compare cost-effectiveness and cost-utility of FHTO and conventional ward procedures for standardized (LC).</p>	<p>Design: Prospective RCT</p> <p>Method: 15D quality of life tool was administered at the baseline and 1 month after.</p> <p>Conceptual Model: Process improvement model</p>	<p>Sample: N= 47 patients with symptomatic gallstones were randomized to receive</p> <p>Setting: Finnish hospital setting</p>	<p>IV: Created Process of check in for procedure</p> <p>DV: - Hospital costs, -Length of postop-stay, -Infection rate</p>	<p>Checked in through FHTO (28 patients)</p> <p>Checked in via conventional manner (19 patients)</p> <p>The mean health care costs with FHTO (1695 EUR) were significantly lower ($p < 0.001$) than in the conventional arm (2234 EUR).</p> <p>Number of patients discharged on the first postoperative day was 27 (96.4%) and 15 (78.9%) with two (7.1%) infections in the FHTO and four (21.1%) in the conventional arm.</p>	<p>Stochastic Analysis approach over a month</p> <p>A difference in QALYs gained (0.0174; $p = 0.030$) favoring FHTO was observed.</p> <p>According to a cost-effectiveness acceptability curve, the probability of FHTO being cost-effective was 99%</p> <p>Quality-Adjusted Life Years (QALY) Calculation used</p>	<p>-FHTO can introduce substantial cost savings</p> <p>-Have impact on both clinical measures and quality of life.</p> <p>The results were robust to probabilistic sensitivity analyses</p>	<p>JHNEBP Level of evidence (LOE): LI A</p> <p>Worth To Practice: Hospital acquired infections can be avoided if FHTO implemented</p> <p>Strengths: Identifies risks of home environment and is a multidisciplinary approach</p> <p>Weakness: Studies with larger numbers of patients are needed to assess whether conventional ward procedure can be a source of infections</p> <p>Feasibility: Implementation is feasible to all patients not only the those who are located geographically farther from medical center</p> <p>Conclusion(s): I agree with the best practice study concluded this is an efficient way to perform preoperative assessments.</p> <p>Recommendation(s): Needs to compare to new phenomenon- From Home to Operation</p>

Abbreviations: 1 Euro = 1.18 US Dollar; From Home to Operation (FHTO) Quality-Adjusted Life Years (QALY) Laparoscopic Cholecystectomy (LC); randomized controlled trial (RCT)

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Rathnayake, D., Clarke, M., & Jayasinghe, V. (2021). Patient prioritization methods to shorten waiting times for elective surgery: A systematic review of how to improve access to surgery. <i>PLOS one</i> , 16(8), e0256578. https://doi.org/10.1371/journal.pone.0256578							
<p>Purpose: To bridge the evidence, gap in existing literature to patient prioritization methods to reduce waiting times for elective surgery.</p>	<p>Design: Systematic review</p> <p>Method: Electronic database</p> <p>EndNote citations management software</p> <p>Conceptual Model: PRISMA Model (Preferred Reporting Items for Systematic Reviews and Meta-Analysis)</p>	<p>Sample: N= 7543 records</p> <p>Setting: Database searched PubMed, EMBASE, SCOPUS, Web of Science, and the Cochrane Library, with our most recent searches in January 2020)</p>	<p>IV: Prioritization methods and tools: Clinical Priority Assessment Criteria (CPAC)</p> <p>MAPT (Multi attribute Prioritization Tool</p> <p>NIKE (National Indications model for Cataract Extraction)</p> <p>DV: Surgery waiting times.</p>	<p>There were four quasi-experimental studies, 11 observational studies and two systematic reviews.</p> <p>Horizontal equity in medical literature</p> <p>Vertical equity is often justified by clinical urgency</p>	<p>Electronic search yielded 7543 records.</p> <p>Reduced to 5346 after deduplication in EndNote citation management software.</p> <p>362 potentially relevant citations were selected, and this was reduced to 196 articles after full article screening for the extended scope of the full, portfolio review. Of these, 105 simulation and modelling studies were rejected at this stage. After grouping the citations to different strategies for the same intended outcome of reducing waiting times, 17 articles were judged eligible for this sub-review because their major emphasis was on methods for prioritizing patients to reduce waiting time for elective surgery.</p>	<p>Research has identified potential structural barriers to equitable access to elective surgical care and the importance of prioritization to the fair allocation for services.</p> <p>Benefits of using universal prioritization criterion for all types of elective surgeries.</p> <p>Prioritization criteria were specifically based on measures.</p> <p>Evidence-based criteria are likely to reduce waiting times and improve equitable access.</p>	<p>JHNEBP Level of evidence (LOE): V A</p> <p>Worth To Practice: Study provides a single framework to improve the quality and efficiency of elective surgical care provision in a variety of health settings.</p> <p>Strengths: Identifies multidisciplinary scopes, Transitioned standardization of care, integration of best practices with supporting evidence</p> <p>Weakness: Study did not capture the voice of customer.</p> <p>Feasibility: Implementation is feasible to Surgical Services within project scope. care model shifted throughout the medical center.</p> <p>Recommendation(s): Need to develop Universal prioritization tools with vertical and horizontal equity would help with re-ordering patients on waiting lists for elective surgery and reduce waiting times.</p>

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Turunen, E., Miettinen, M., Setälä, L., & Vehviläinen-Julkunen, K. (2018). The impact of a structured preoperative protocol on day of surgery cancellations. <i>Journal of Clinical Nursing</i> , 27(1-2), 288–305. https://doi.org/10.1111/jocn.13896							
Purpose: To evaluate the impact of implementing an evidence-based, structured preoperative protocol on day of surgery cancellations	Design: Observational study with two study phases: before and after Method: Comparative Effectiveness Research Theoretical Model:	Sample: N= 591 1 September 2013–31 May 2014 N=542 September 2015–May 2016 Setting: Single University Hospital Registry for 13 operative specialties	IV: Implement structured Preoperative protocol DV: Surgery cancellations on day of surgery Compliance rates were analyzed from participating specialties.	Electronic and structured evaluation form for measuring the compliance rate of preoperative protocol in each operative specialty. Surgical cancellation rates Specialty department protocol implementation compliance rate	Surgical cancellation rates were calculated from the total number of scheduled elective operations and reasons. Patients who failed to show up for scheduled procedures were analyzed during phase I prior to implementing the structured preoperative protocol. After protocol was implemented, the number of patients who failed to show up significantly decreased.	This study reported a correlation between the rate of cancellation and the rate of preoperative protocol compliance. The mean of compliance to the preoperative protocol across all specialties was 82.3%	JHNEBP Level of evidence (LOE): II A Worth To Practice: Research provided evidence based preoperative care protocol and the outcomes of its implementation. Strength: This study demonstrated the impact of a standardized preoperative protocol on the surgical cancellation rates. Provided evidence to promote preoperative outreach to promote scheduled arrival of surgical patients. Weakness: Study limitations were the lack of resource related reasons (missing bed, equipment unavailable, etc...) Feasibility: Implementation was feasible and aligned with Surgical Services workflow redesign within project scope. Conclusion(s): This study provides evidence-based preoperative care protocol introduced to decrease surgical cancellations. Recommendation(s): Report the cancellations that involved equipment, supplies.

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
APA reference: Wilson, M. A., Sinno, M., Hacker Teper, M., Courtney, K., Nuseir, D., Schonewille, A., Rauchwerger, D., & Taher, A. (2022). Toward zero harm: Mackenzie Health's journey toward becoming a high reliability organization and eliminating avoidable harm. <i>Journal of patient safety</i> , 18(7), 680–685. https://doi.org/10.1097/PTS.0000000000000978							
<p>Purpose: To eliminate preventable harm and to introduce simultaneous, systemic, health system-wide changes that transform both the practice and culture of patient safety.</p>	<p>Design: Descriptive qualitative study</p> <p>Method: Process redesign using 5-part strategy for cultural and process redesign conducted over 3 years.</p> <p>Conceptual Model: Patient safety framework.</p>	<p>Sample: N= 700 beds</p> <p>Setting: Multi-site regional health system consisting of 96 complex continuing care/rehabilitation beds, 168 long-term care beds, and 112 reactivation care center beds.</p>	<p>IV: A safety culture survey that was conducted</p> <p>Implemented 5 elements: (1) leveraging leadership support in planning and implementation, (2) developing a local quality and patient safety framework, (3) establishing meaningful quality aims, (4) standardizing implementation of safety review processes, and (5) creating a comprehensive communication plan.</p> <p>DV: Patient Safety incident reports</p>	<p>Patient safety incident reports per 1000 patients.</p> <p>Percent rates were measured for:</p> <p>Patient safety incident reporting</p> <p>Falls with injury,</p> <p>Pressure injury rates,</p> <p>Central line-associated blood stream infections,</p> <p>Medication reconciliation rate,</p> <p>Irretrievable specimens.</p>	<p>Incident reporting increased to 37%</p> <p>Falls with injuries decreased by 39%</p> <p>Pressure injury rates decreased by 37%</p> <p>Central line-associated infections decreased by 34%</p> <p>Medication reconciliation rate decreased by 3.3%</p> <p>Irretrievable specimen rate decreased rate to 0.</p>	<p>Study findings reported a baseline average of 11.80 reported incidents which increased by 37% to 16.15 reports per 1000 patient-days which is an increase over the 8-month period time.</p> <p>Developed a local quality and patient safety workflow.</p> <p>Mandated safety review process</p> <p>Provided real-time updates on progress via electronic dashboards to</p>	<p>JHNEBP Level of evidence (LOE): III A</p> <p>Worth To Practice: This study demonstrates how increased safety event reporting may impact the reduction in patient harm to achieve quality aims.</p> <p>Strengths: Study reported reduction in rates in the journey to eliminating preventable harm for patients and emphasized on instituting a just culture</p> <p>Weakness: Study was limited in obtaining robust historic data on patient safety indicators prior to 2019. Measures of sustainability were not available.</p> <p>Feasibility: Implementation was feasible and aligned with Surgical Services workflow redesign within project scope.</p> <p>Conclusion(s): This study developed and implemented a 5-part zero harm patient safety program that aimed to eliminate preventable patient harm.</p> <p>Recommendation(s): Find measures of sustainability and report trends</p>

Appendix C.
IHI/Model for Improvement

IHI- IMPROVEMENT MODEL FRAMEWORK

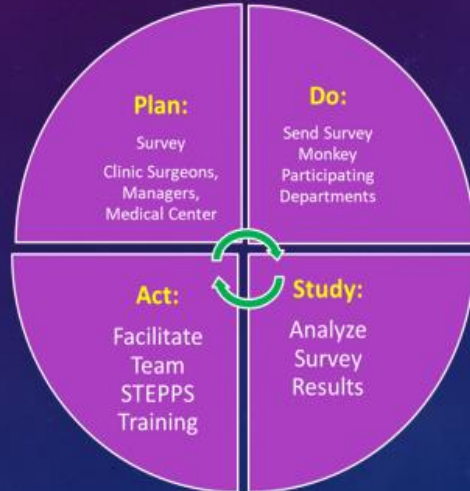
DNP PROJECT

EVIDENCE-BASED PRACTICE

What are we trying to accomplish?

Redesign Current System

Fragmented, Costly, & Inefficient
Lacks person-centered care
Patient Dissatisfier



Best Research Evidence

How will we know that a change is an improvement?

Preop Optimization

Fragmented, Costly, & Inefficient
Lacks person-centered care
Patient Dissatisfier



Clinical Expertise

What changes can we make that will result in improvement?

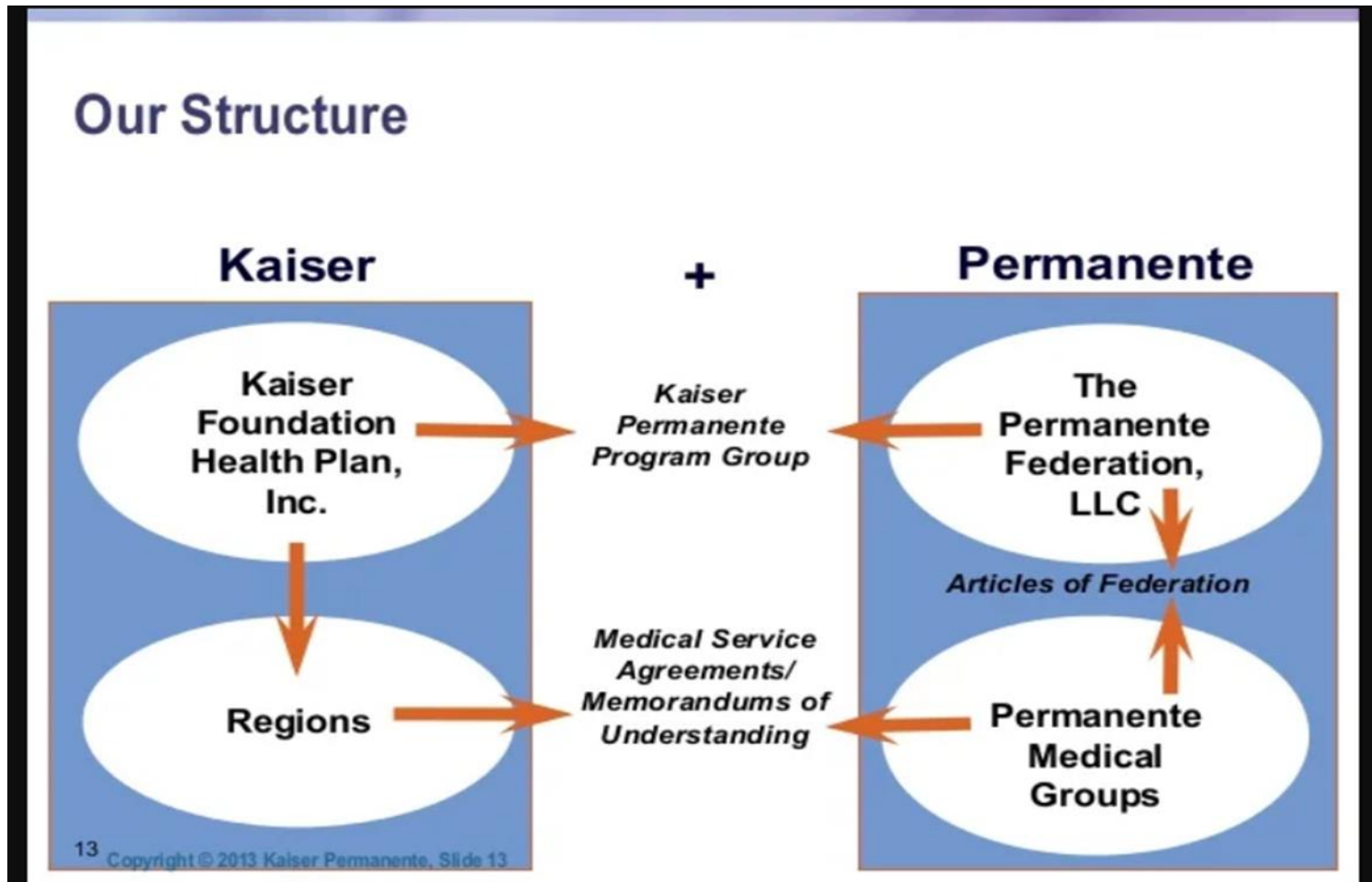
Decrease Surgical Cancellations

Fragmented, Costly, & Inefficient
Lacks person-centered care
Patient Dissatisfier



Patient Preference

Appendix D. Healthcare Delivery Model



Source: <http://image.slidesharecdn.com/kaiserpermanentepresentation-141007111815-conversion-gate01/95/an-overview-of-kaiser-permanente-integration-and-information-systems-in-health-care-13-638.jpg?cb=1412685949>

Appendix E.
SWOT Analysis

SWOT Analysis:



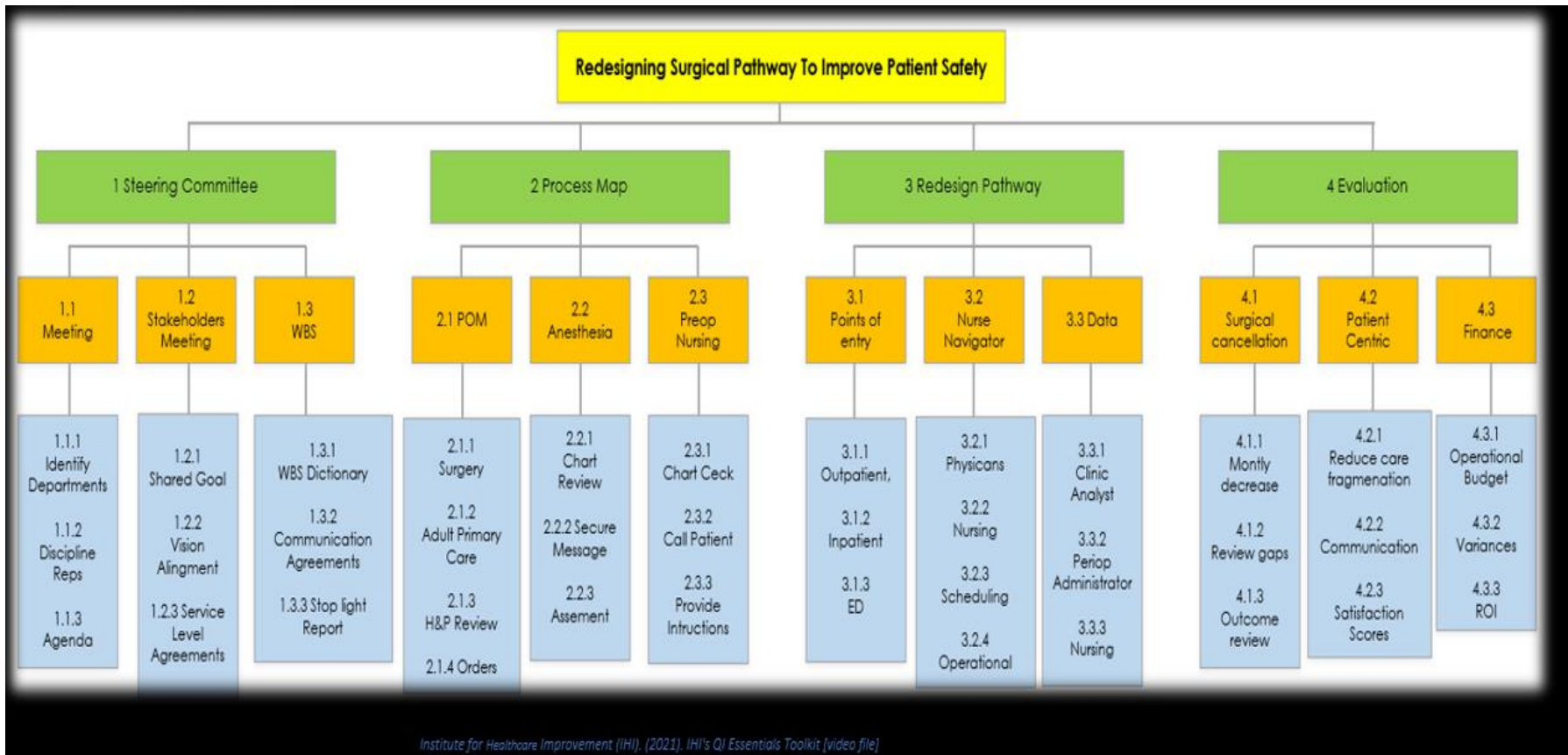
Appendix F.
Communication Matrix

Communication Plan Matrix

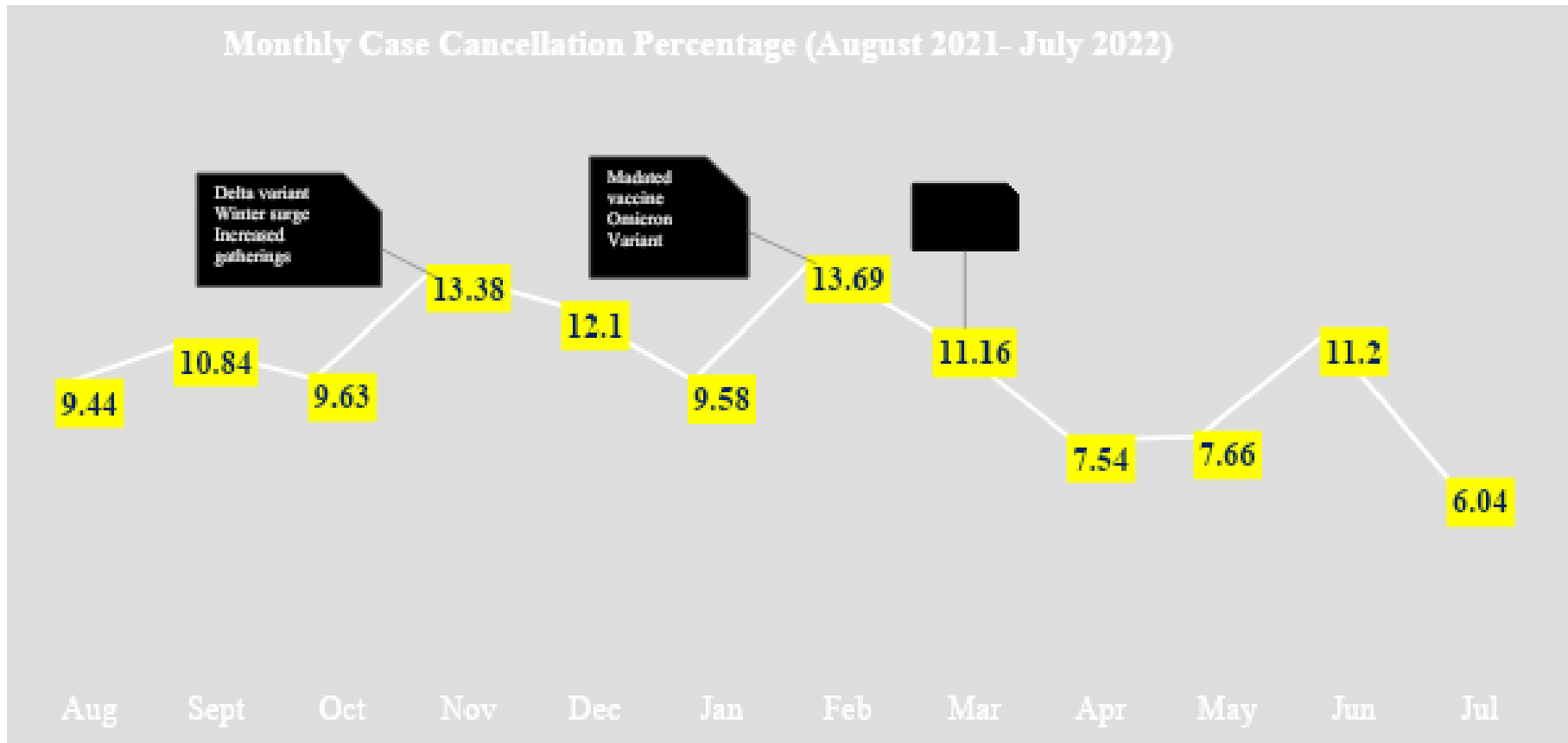
Communication	Who (by/to whom)	Frequency	Goal	Route
Academic Advisors				
Dr. Juli Maxworthy	Anna/ Dr. Maxworthy	Weekly	Review project status, discuss barriers and updates, share progress	Email, zoom, phone calls
Dr. Cathy Coleman	Dr. Maxworthy/ Anna	As needed	To received feedback from draft prospectus	Email, zoom if necessary
Project Sponsors (Corporate/System Nursing Leadership)				
Dr. Earl Laih	Anna/ Shelly Bressoud	Twice a week	Review project from a systems perspective, strategize about barriers and facilitators, provide updates	Email and conference calls
Site (Name: Kaiser Permanente Fresno Perioperative Services Department Leadership)				
Shelly Bressoud	Anna/ Shelly Bressoud	Once	Introduce the project plan and request site participation	Phone conference
Shelly Bressoud	Anna/ Shelly Bressoud	Once	Introduce the project plan and request participation	Face-to-face
Shelly Bressoud	Anna/ Shelly Bressoud	Once	Introduce the project plan and request letter of support	Face-to-face
Shelly Bressoud	Anna/ Shelly Bressoud	Once	Discuss project, request participants, coordinate pre and post implementation site visits	Phone conference
Other				
George Nan	Anna/ George Nan	Twice a week	Discuss data collection methodology and analysis plan	Phone conference and face-to-face

A. Benedictos, USFCA ELDNP Spring 2022

Appendix H. Work Breakdown Structure



Appendix I.
Cancellation Tracker



Monthly	Number of surgery days	# of days below target	# days target met	% Optimized	Total Case	Performed Cases	Canceled/ Postponed cases	% Canceled
August 2021	24	11	13	54%	667	604	63	9.44
September 2021	22	8	14	64%	636	567	69	10.84
October 2021	21	8	13	62%	654	591	63	9.63
November 2021	21	12	9	43%	538	466	72	13.38
December 2021	21	11	10	48%	603	530	73	12.10
January 2022	22	8	14	64%	629	569	60	9.58
February 2022	20	11	9	45%	584	504	80	13.69
March 2022	22	8	14	64%	627	557	70	11.16
April 2022	21	6	15	72%	716	662	54	7.54
May 2022	22	8	14	64%	626	578	48	7.66
June 2022	23	10	13	57%	723	642	81	11.20
July 2022	21	3	18	86 %	629	591	38	6.04

**Appendix J.
Return on Investment (ROI)**

Costs

Workforce

Training

Ongoing

Total Costs/ Year

RN 1- Preop Call	152,000	8,000	152,000	312,000
RN II- Chart Checks	152,000	8,000	152,000	312,000
RN III- COVID Testing	121,600	8,000	121,600	251,200
NP – TPMG	152,000	8,000	152,000	312,000
Total Costs	577,600	32,000	577,600	Grand Total = 1,187,200

Cost Savings/ Avoidance

Financial Analysis

Cost Avoidance



Summary

Total Monthly Cancellation Costs
\$457,600
 Total Monthly Workforce Investments
\$19,200
 Training
\$12,800
 Savings
\$425,600



Monthly Cancellations

Surgery	Amount
Spinal fusion	\$250,600.00
Knee Arthroscopy	\$82,500.00
Lap Appy	\$79,500.00
OBGYN	\$45,000.00

Monthly Workforce Investments

Item	Amount
RN 1 (full-time)	\$8,000.00
RN 2 (full-time)	\$8,000.00
RN 3 (part-time)	\$3,200.00

Appendix K.

IRB and/or Non-Research Approval Documents (Statement of Determination)



Doctor of Nursing Practice Statement of Non-Research Determination (SOD) Form

The SOD should be completed in NURS 7005 and NURS 791E/P or NURS 749/AE

General Information

Last Name:	<u>Benedictos</u>	First Name:	<u>Anna</u>
CWID Number:	<u>2053.7072</u>	Semester/Year:	<u>Fall 2021</u>
Course Name & Number:	<u>Practicum II Focus: Micro System NURS-791-E-1</u>		
Chairperson Name:	<u>Dr. Juli Maxworthy</u>	Advisor Name:	<u>Dr. Juli Maxworthy</u>
Second Reader Name:	<u>Dr. Cathy Coleman, DNP, RN, OCN, CPHQ, CNL</u>		

Project Description

- Title of Project:** Periop Safety Workflow Redesign 2.0
- Brief Description of Project** (*Clearly state the purpose of the project and the problem statement in 250 words or less*):
The purpose of this Doctor of Nursing Practice (DNP) project is to redesign workflow that targets Safe Surgery solutions published by Joint Commission's Zero Harm initiatives. By instituting a safety stop, those cross-checking patient readiness for surgery will improve the overall quality and patient safety in a process that overlaps two entities within an integrated healthcare system. This medical center performs over 750 surgical cases a month, significantly impacted by the COVID-19 pandemic when all elective surgeries were postponed or canceled. The project will focus on redesigning workflows that access perioperative services by instituting a nurse-led safety stop and cross-check performed before surgery rather than on the day of surgery.

In 2020, a comprehensive patient-centered process map was created to identify touch-points across settings during the care coordination experience. Workflow analysis of nursing staffing revealed suboptimal patient screening for surgery. An average of 10 cases a week report missed key elements during the surgical fitness assessment that resulted in cancellation on the day of surgery—justification for 1.5 FTE additional preop call nurse in addition to creating a dedicated workspace. To build upon the nurse practice change and develop a new PreOp Call (POC) program in 2020, this DNP workflow The nurse-led safety stop practice will improve the overall quality of surgical clearance and build in system cross-checks for effective workup, reduce waste, and demonstrate cost savings.
- AIM Statement: What are you trying to accomplish?**
To improve quality and patient safety by redesigning workflow to include nurse-led safety stop cross-check practice to reduce annual surgical cancellation rate from 4.2 % to 2.1%, by October 2022, among the adult elective surgery population.

4. Brief Description of Intervention (150 words):

The DNP workflow redesign project will integrate a system safety stop workflow that cross-checks surgical optimization by enhancing nurse-led coordination of care. Perioperative Services will collaborate across entities to coordinate and strategize the workflow redesign to integrate system safety stops and cross-checks to prevent same-day surgical cancellations. Components of the interventions will include Physician Medical Group, Clinic Operations, Nurse Practitioner (NP), and Perioperative Services.

4a. How will this intervention be implemented?

This project will enhance the current processes at an acute care hospital located in San Joaquin Valley across an integrated healthcare system by redesigning the workflow and coordination of care for adult elective surgical cases. Workflow redesign will categorize three major components that improve quality and patient safety during surgical preparation upstream.

- The clinic will perform carbon monoxide screening for smokers, provide enhanced recovery after surgery kits, order surgical clearance labs, radiology, or cardiology referrals, obtain surgical consents, and upload into the chart.
- Nurse Practitioner (NP) will perform a patient assessment for surgical clearance, review results from labs, radiology, cardiology, and witness patient consent.
- Perioperative Services PreOp Call (POC) Nurse will perform safety stop and cross-check. Safety Cross Checklist for preop call intake screening will be conducted for all scheduled surgeries. Conduct chart review, notations of any outliers that could impact clearance for surgery will be sent to Surgeon and NP via Teams communication tool. The surgical case will be rerouted for physician clearance and removed from the OR board.

Stakeholders will be notified and invited to participate in scheduled meetings, receive monthly reports and status update email reports.

5. Outcome measurements: How will you know that a change is an improvement?

This DNP project will demonstrate cost savings and improve operational outcomes, processes, and balance measurements.

- The primary outcome measure is defined by the DOS cancellations from the current rate of 4.2%.
- Process measures will include the number of times modifications were made to scheduled surgeries the day before and on the day of surgery. Specific process measures will be the number of care coordination actions taken within 24 hours of scheduled surgery.
- Balancing measures include the number of surgical readmission rates.

Automatic tracking reports produce the total number of surgery cancellations each week. Analyzing the cost by surgical case minutes booked will demonstrate a minimum cost savings of \$4,000 per cancellation per day. Redesigning the existing workflows to integrate nurse-led safety stops will ultimately improve quality and patient safety through the care delivery system. Staff satisfaction survey will be conducted across both entities to measure.

Appendix L.

Letter of Support from Agency



Doctor of Nursing Practice Comprehensive Project Letter of Support

This is a letter to support Anna Benedictos, to implement their DNP Comprehensive Project to integrate Periop Safety Stop Workflow Redesign 2.0 at Fresno Medical Center Kaiser Permanente. We give them permission to use data associated with her/his DNP Comprehensive Project Paper and in future presentations and publications.

INFORMATION Name and Contact Information:	Signature:	<i>Shelly Bressoud</i> Electronic signature
	Name & Title:	Shelly Bressoud, MSN, RN Kaiser Permanente Fresno Medical Center Perioperative Services Department Manager PreOp, OR, and PACU
	Telephone:	559-203-0630
	Email:	Shelly.R.Bressoud@kp.org

STUDENT NAME:	Anna Benedictos
STUDENT EMAIL:	anna.l.benedictos@kp.org
STUDENT TELEPHONE:	559-290-1520