# Reducing Day of Surgery Cancellations by Standardizing Preoperative Instructions

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Abstract

A Quality Improvement project was undertaken to reduce the day of surgery cancellation rate in a free standing ambulatory surgical center (ASC). The improvement process to effect change was to standardize the preoperative teaching instructions that were given to patients through a fractionated preoperative teaching delivery source of six individual physician offices. Inter-professional collaboration was undertaken to produce a single preoperative instruction sheet to be taught to patients, to improve their compliance with preoperative instructions. The overall cancellation rate remained unchanged by the intervention, but the type of cancellations changed significantly. Patients were better prepared to understand the fasting, financial responsibility, rules for rescheduling their procedure and medical conditions unacceptable to the ASC. Unchanged were the significant number of patients who did not show for their procedure nor call to cancel.

Reducing Day of Surgery Cancellations by Standardizing Preoperative Instructions

Cancellation of surgical cases are costly to the healthcare system and an inconvenience to patients. Researchers found a 4.4% day of surgery cancellation (DOSC) rate with 71.6% of those canceled for avoidable circumstances (Kaddoum, Fadlallah, Hitti, El-Jardali, & El-Eid, 2016). Gilliesm, Wijeysundera & Harrison (2018), conducted a study and found a 10% - 14% cancellation rate with almost two-thirds of those canceled being avoidable. Researchers reviewed over 10,000 surgical cases and noted a four percent day of surgery cancellation rate with 23.3% due to "failure to follow pre-operative guidance" (Jiménez et al., 2006). Preoperative patients receive guidance from the surgical teaching staff, outlining Nils per os (NPO) and preoperative medication instructions. NPO guidelines were created to reduce the incidence of pulmonary aspiration during anesthesia. In recent years, significant research has been conducted to determine the optimum NPO timelines for different types of oral intake, dividing the intake into five distinct categories (American Society of Anesthesiologists Task Force [ASA], 2017). The governing body for Gastroenterologists (GI) that outlines recommendations for preoperative (preop) regimen is the American Society of Gastrointestinal Endoscopy (ASGE). Following these recommendations, GI physicians require preop oral preparation (prep) for optimum colon visualization, the required GI preop prep can be given without conflict with current anesthesia NPO requirements (ASGE Standards of Practice Committee, 2018).

Cancellation of cases are problematic, to both the patient and the healthcare facility. Patients have made arrangements for support the day of surgery, obtaining a ride, having someone be available to assist them and altering their eating habits, albeit not enough to follow the instructions (Sandra Salas, RN Director, personal communication, Dec 3,

2018). Canceling surgical procedures increases the financial burden of the ambulatory surgical center (ASC) through the reduction of staff productivity and procedural through put. Most cancellations are determined once the patient has already arrived to the preoperative holding area, patient has changed to surgical attire and has an intravenous line placed prior to the evaluation by anesthesia personnel.

## Background

In an attempt to make preoperative orders uniform and easy to follow, historically, orders were written: NPO after midnight, this assured all scheduled patients were acceptable for a morning start time, if the surgical schedule changed. The NPO after midnight policy lead to some patients fasting for excessive hours, especially if their surgical cases were in the late afternoon. ASA current recommendations for NPO guidelines are, anesthesia is acceptable eight hours after a full meal, six hours after a light meal or non-human milk, four hours after breast milk and two hours after clear liquids (ASA, 2017).

Abola and Gan (2017) speak to the resistance of providers to move from the historical standard to the new guidelines, citing fear of pulmonary aspiration and simply not accepting the conclusions of the new standards. Maltby (2016) further speaks of the dogma in the 'NPO after midnight' belief and stating "traditions are difficult to break". Research has shown that clear liquids up to two hours prior to surgery has provided better gastric emptying than the traditional eight hours NPO, and is independent of patient age or body mass index (BMI) (Shiraishi et al., 2017).

Patient compliance can be an issue as well. Current NPO recommendations are not as easy to follow as past NPO instructions. Patient understanding of the reasons for following preoperative instructions is critical for compliance. Lim, Lee, & Ti (2014) concluded that poor

understanding of the reasons for preoperative instructions "lead to unintentional noncompliance". Although, with comprehensive preoperative screening and teaching, researchers have decreased the DOSC rate to 1.23% (Olsen & Dhakal, 2015).

The focus of this Quality Improvement (QI) Project is to put into place, ASC policies that follow the current national standard guidelines, provide clarity to patients regarding preoperative medications, and NPO instructions that will agree with the providers beliefs, thus reducing the number of canceled surgical cases due to non-compliance with preop instructions.

## Problem Statement

Patients not properly fasting prior to elective surgery will have their surgical case delayed or canceled. In a retrospective study, Chang, Chen, Chen, Poon, & Lui (2014) found inadequate NPO status as the reason for cancellation 3.4% of the time. Shieh et. al., (2013) not only showed that quality preoperative teaching increased the quality of bowel prep and leads to less cancellations but also leads to higher adenoma detection, but this was not proved statistically. Patients who do not have the proper NPO regimen are considered 'full stomach', which increases the risk of pulmonary aspiration with anesthesia. Full stomach cases are considered emergencies and the procedure will not be performed, unless the diagnosis is considered life or limb threatening and requiring surgical intervention (Salem, 1970).

Cancellations and delays are primarily due to incorrectly following of NPO guidelines or inadequate colon prep (not following the preoperative medication regimen) (Dr. V. Patel, Medical Director, personal communication, Dec 3, 2018).

Individual providers treating the patient, make the final decision to delay or cancel the case based on the personal perspectives. Both anesthesia providers and GI providers will be required to collaborate within their specific specialty groups and with the other specialties,

including the ASC nursing staff to agree on a standard. Thus, providing a standardized approach for preoperative instruction, will decrease the rate of day of surgery cancellations, and improve patient satisfaction.

## Purpose Statement

The project aim, is to reduce the number of canceled cases secondary to patients improperly following preoperative instructions. Reducing same day cancellations of surgical cases, will improve productivity and throughput of patients.

## Project Question

Deciding on a project question format, Moran (2017, p. 140), state that using the PICOT (Population, Intervention, Comparison, Outcome, Timeframe) format "helps the focus on elements of the question that are of interest".

Are preoperative surgical patients (P) who are given standardized preoperative instructions prior to surgery (I), compared to preoperative patients historically not given standardized instructions (C), less likely to have their cases canceled (O) over a six weeks period (T)?

## Project Objective

The objectives of this QI Project:

- Collaborate with GI physicians, anesthesia providers and nursing staff, to establish the requirements for developing a standardized protocol for preop teaching.
- Develop a preoperative instruction protocol for the ASC.
- Educate preoperative staff, instructing the patients, the new preoperative teaching protocol.
- Reduce same day surgical delays and cancelations by 15% over a six-week period.

## Search Terms

The review of several online scholarly search engines: PubMed, ProQuest, Google Scholar and Cumulative Index of Nursing and Allied Health Literature (CINAHL), produced several articles appropriate to the QI project and project question. Addressing the issues central to the QI project: national standards of care, rate of cancellations, and effectiveness of preoperative teaching, these search terms were used for scholarly search. Utilizing search databases at the Jay Sexter library, searching PubMed for "rate of surgical cancellations", limited to the last five years, produced 2760, this was further refined by narrowing the search to "ASC surgical cancellation rate", with a return of 158. In the initial search, searches limited to articles since 2014, "preoperative patient education" returned 31,200 articles in Google Scholar but when filtered to "ASC preoperative patient education", it returned 930 and filtered further to "ASC preoperative NPO patient education" the results were 37. 'NPO guideline' was searched in ProQuest with the first searched item returned, producing the current national standard.

## Inclusion and Exclusion Criteria

With the closing of the National Guideline Clearinghouse, consolidated data for rate of surgical cancellations is difficult to obtain. Research data for reporting DOSC for single healthcare facilities or facilities grouped under a single management entity were readily available and appropriate for the QI project parameters. The focus of the search was the incidence and reason for surgical cancellations and the processes attempted to lower the rate of canceled cases. Studies excluded from this review included the following: not translated or completed in English, qualitative studies stating opinions of cancellation rates, blog posting, advertisements, articles that did not apply to the QI project proposed and articles that were abstract only. Literature deemed acceptable for inclusion, were articles that this author had full

unrestricted access, articles that discussed cancellation rates by quantitative analysis, qualitative analysis of the understanding of preoperative teaching; these were available in case studies, review articles, reports and evidence-based research with the goal to decrease the DOSC rates.

## Review of Literature

Preoperative teaching is vital to ensuring that patients have met the requirements for surgery. Preoperative teaching starts the moment the patient is informed of surgery at the physician's office, continues with the ASC clerical staff and ASC preoperative nurses, all with the goal of providing the patient with preoperative instructions from the specialists involved in their care (Bundgaard, Nielsen, Sørensen, & Delmar, 2014; Turunen, Miettinen, Setälä, & Vehviläinen-Julkunen, 2016). Preoperative instructions can be complex and must target a wide range of demographics. Brumfield, Kee, and Johnson (1996) conducted a descriptive replication study to identify teaching perceptions between patients and teaching staff, the authors identified the complexities of information and perceived order of importance in the comparative groups. Teaching perceptions will be important to the design of this QI project and the Brumfield et al. study provides a working example to complete this task.

Mitchell (2016) conducted an electronic questionnaire of 137 nurses, questioning preoperative assessment nurses their choice of information to give preoperative patients, and how their work environment effected those decisions. From the responses, Mitchell (2016) concluded, patient turn-over is high, preoperative nurse-patient contact is limited; thus, preoperative teaching staff must precisely deliver information to patients, answer questions and co-ordinate patient throughput in a very organized manner. The goal of preoperative teaching is to reduce the number of cancellations, no-shows and prepare the patient for surgery (Souzdalnitski & Narouze, 2014; Turunen, Docent, Serälä, & Vehviläinen-Julkunen, 2017). Lee,

C., Rodger, C., Oh, A. & Muckler, V. (2017) conducted a review of electronic medical records to determine that DOSC are costly, problematic and most of them are preventable, these finding were also found in a similar fashion by Kumar, R. & Gabdhi, R. (2012) and Kaddoum, Fadlallah, Hitti, El-Jardali, & El-Eid, (2016).

ASA (2011) published NPO national guidelines, the low risk of aspiration of the new guidelines were verified by Shiraishi et al. (2017) in a controlled comparative study using two volunteer groups of subjects. This study helps to alleviate anesthesia providers fear of aspiration and essential to accepting the new NPO guidelines.

### Relevance of Methods

Upon reviewing the study methodologies in the discussed literature, the emerging themes are relevant to this DNP project. The literature discussed included randomized controlled trials, meta-analysis of randomized controlled trials, retrospective and observational studies, mixed-methods comparative studies, multi centered cross-sectional studies, integrative reviews, systematic review of peer-reviewed research studies, retrospective cohort studies, exploratory qualitative studies, and interventional trials. These methods are relevant to the aim of the studies performed and are relevant to this DNP project, all producing the same results of decreasing DOSC.

## Impact of Problem

Preoperative teaching and patient understanding are vital to the success and overall mission of the ASC (Bernier, Sanares, Owen, & Newhouse, 2003; Bouamrane & Mair, 2014). Patients having their elective procedures canceled is inconvenient and stressful, missed days at work, disruption of daily life, and significant emotional trauma to the patients and their families (Dell'Atti, 2013). DOSC is a financial burden to the ASC and reducing DOSC improves

surgical utilization, increases ASC revenue and improves patient satisfaction (Appavu, Al-Shekaili, Al-Sharif, & Elawdy, 2016; Pratap et al., 2015). Olsen, R., & Dhakal, I. (2015) compared DOSC between two groups of patients over a six-month period, patients were randomized either into the existing preoperative screening or into a newly designed comprehensive preoperative assessment. In a pre-post, quasi-experimental pilot study, researchers looked at preoperative work flow and fragmentation of preoperative teaching, citing interruptions and multiple staff encounters as decreasing work effectiveness (Filer, Beringuel, Frato, Anthony, & Saenyakul, 2017). The newly formed comprehensive screening and teaching tool proved statistically better, $P<0.0001$, in reducing DOSC compared to current assessment and teaching being used at their facility (Olsen & Dhakal, 2015).

**Preoperative Teaching and Barriers to Overcome**

Patients choosing surgery at an ASC instead of hospital-based healthcare grows each year, accounting for 57.8% of surgery in the United States in 2014(Steiner, Karaca, Moore, Imshaug, & Pickens, 2018). Inpatient surgeries offer more nurse-patient preoperative teaching time. With the growing shift to ASC surgeries, nurse-patient preoperative time will be decreased; therefore, a best practice for preoperative education is vitally important for patient preparedness for outpatient surgery (Edwards & Slawski, 2016). Through literature review, Kruzik (2009) states benefits of preoperative education are reducing fear and anxiety of the procedure, understanding expected activities throughout the perioperative stay, and information of preoperative requirements for the procedure. Preoperative evaluation has evolved significantly from a simple preadmission process to a multidisciplinary evaluation and teaching of the patient to optimize the patient for surgery (Edwards & Slawski, 2016).

**Preoperative Teaching Staff**

Patients receive preoperative teaching, education and facility requirements from a variety of sources: physicians and their office staff, ASC clerical staff, ASC nurses tasked with preoperative instructions, along with anesthesia services. In comparison to the multiple caregiver model of providing instructions, researchers at the Mayo Clinic used anonymous surveys of patients who received nurse led preoperative classes to address fears, anxiety and understanding of the operative process, to show high success rates in understanding and reducing fears (Bisbey et al., 2017).

**Financial Burden of Surgical Cancellations**

Surgical cancellations are costly and inefficient for the healthcare center and many challenging variables make determining the exact cost of DOSC difficult (Epstein & Dexter, 2015). Such variables as: diverse third party payor reimbursements, if medical providers are facility employees or independent practitioners, and ability to shift hourly paid staff to other meaningful duties. Although financial burdens are not limited to the healthcare center, patients experience not only financial loss but emotional strain from cancellations (Dell'Atti, 2012; Mulira, Smith & Moorman, 2017). Initiatives to reduce cancellations, improve efficiency and ultimately increase revenue have been studied. Olsen and Dhakal (2015) have shown that comprehensive preoperative assessment can reduce cancellations, thus improving efficiency. Dexter and Wachtel (2014) advocate reducing costs and making the operative suites more efficient through anesthesia services taking a controlling role in preoperative teaching, patient selection and decision making to reduce unnecessary interventions to save costs (Bryson, Wyand, & Bragg, 2006).

**Controversies**

Challenges exist to the formation of a single page preoperative instruction sheet as a patient teaching tool. Medical providers personal beliefs and independence, slow the process to a consolidated approach and changing the established system (Jones & Van de Ven, 2016). Evans, Baker, Whitney & Barnsley (2015) outline the complexities of change required for healthcare improvement, and emphasize the need for collaboration for success. Jones & Van de Ven (2016) further elaborate that with supportive leadership that address personal resistance of providers, has had important implications for job performance and acceptance of change. Anesthesia providers have resisted the current guidelines, initially outlined in 2011 and updated in 2017, believing 'more is better' when NPO is concerned (American Society of Anesthesiologists Committee on Standards and Practice Parameters [ASA], 2011; ASA, 2017; Maltby, 2006). Anesthesia preoperative guidelines are well established in the literature, and have independent verification of their analysis (ASA,2017; Shiraishi et al., 2017). Medical knowledge is deep in tradition and beliefs are difficult to update (Maltby, 2006). These facts continue to be a challenge in educating some anesthesia providers the new guidelines are best practice (Abola & Gan, 2017).

**Addressing the Problem with Current Evidence**

This QI project is designed to reduce DOSC through standardization of preoperative education. To achieve that goal, a collaboration with preoperative teaching staff, anesthesia providers and surgical providers, is essential to design a standardized preoperative instruction sheet for patients to facilitate proper preoperative following of orders. The preoperative instructions will be detailed on a single page, in an easy to read format that has been agreed upon by the providers and staff. The QI project will be conducted at an endoscopy day surgery center, located in the southwest portion of the United States. Of the nine GI physicians, three are

partnered into a group with the other six practicing solo, all independent of the ASC entity. Anesthesia providers are independent solo practitioners and not associated with the ASC nor the GI physicians.

**Current Recommendations and Benefits**

Patients having day surgery procedures have shorter teaching opportunities by the preoperative teaching team (Mitchell, 2016). The gaps in teaching and understanding of the preoperative instructions can lead to cancellations and delays in procedures, this reduces the ASC proficiency and impacts the care of patients (Malley & Young, 2017). The recognition of this problem by the DNP student has afforded the opportunity to provide leadership grounded in evidence-based practice to effect change and improve patient understanding, patient satisfaction, reduce cancellation, and increase the throughput of patients, this success shown by Olsen & Dhakal (2015). The outcome of this QI project will benefit all stakeholders.

## Significance of Evidence

Preoperative assessment and education are the patient's first step into the surgical arena. Preoperative education focuses on consolidation of information, optimizing the patient for surgery, and preparing the patient for the surgical process (Hofer, Chung, & Sweitzer, 2013). Blitz et al., (2016) have shown that structured preoperative teaching and preparation can influence patient outcomes. Allison and George (2014) state preoperative "assessment of a patient's medical problems has the greatest effect on reducing adverse peri-operative complications" (p.365). Malley, Kenner, Kim, & Blankeney (2015) believe progression through the perioperative environment is a high-risk undertaking with several transitions of care. Malley and Young (2017) further state that nurses working in preoperative assessment, function as advocates during these transitions, identifying the potential risks and needs of the patient. The

action by these nurses not only reduce the risks in preoperative area but their preoperative care follows the patient throughout the entire perioperative process.

## Theoretical/Conceptual Framework

Abstract thought that suggests an explanation of interrelationships between concepts, is a theory (Hall & Roussel, 2017). "Theory provides a particular way of seeing a phenomenon of concern to the discipline" (Smith & Liehr, 2013, p. 8). Dr. Avedis Donabedian developed a conceptual model providing a framework for evaluating health care delivery and outcome. Dr. Donabedian believed that improvements in the structure of healthcare would improve the process and ultimately improve the healthcare outcome and patient satisfaction (Donabedian, 1988). The conceptual framework of the Donabedian model can be seen in Appendix A. Dr. Donabedian's theory, aptly named, the Donabedian model will be used for this QI project.

Nursing is a labor intensive profession and evaluating the quality of nursing care is often determined by patient satisfaction evaluations (Kobayashi, Takemura, & Kanda, 2010). Bryand-Lukosius, D., et al. (2016) discuss the complex task of evaluating advanced nurse practitioners and stress the flexibility of using the Donabedian model. The Donabedian model of measuring outcomes to see the effect of changes in structure and process has been validated by researchers studying patient perception of nursing service quality (Kobayashi et al., 2010).

### Historical Development of Donabedian Model

Distinguished researchers were invited to Chicago in 1965 by the U.S.. Public Health Service and were asked to "consider the influence of social and economic research on Public Health" (Ayanian & Markel, 2016, p. 205). Dr. Donabedian was an attendee of the conference and a physician researcher working at the University of Michigan at that time. In response to the question, Dr. Donabedian described, the three elements of a new research theory (Donabedian,

1966). The Donabedian model has three major components: Structure, Process, Outcome; and is depicted in the appendix as a diagram, showing the basics of the conceptual model (HealthKnowledge, 2018).

After his initial concepts were published, Dr. Donabedian continued completing extensive research to support his conceptual model, furthering the understanding into a 1990 article outlining the 'seven pillars of quality' (Donabedian, 1990). This framework was later used by the Institute of Medicine (IOM) to complete their landmark reports: *To Err is Human* and *Crossing the Chasm (Institute of Medicine [IOM], 1999: Institute of Medicine [IOM] 2011)*. The IOM reports were a catalyst for healthcare change including the formation and development of the Doctor of Nursing Practice (DNP) educational tract (Ayanian & Markel, 2016).

## Applicability of Donabedian Model to Current Practice

The Donabedian model is flexible and simple enough to be applicable to many healthcare scenarios. The framework is designed to modify a structure within healthcare, to improve the process of how care is delivered and ultimately improve the outcomes of patient care. The process of changing structure in the proposed QI project surgery center, will be changing the preoperative instruction data sheet. The process will be altered in the teaching of patients preoperatively because of the update guidelines used in the preoperative instructions. Desired outcomes will be the decrease in DOSC and data will be collected to measure success or failure.

The Donabedian model has shown to be a valid theoretical model in five year study of trauma services in Canada. Researchers cited statistically significant correlations between the Donabedian approach of study parameters in structure versus process and process versus outcome (Moore, Lavoie, Bourgeois, & Lapointe, 2015). Kobayashi, Takemura and Kanda

(2010) demonstrated the effectiveness of using the Donabedian model to measure changes in structure and process to improve outcomes in a patient satisfaction research trial. Researchers, via questionnaire, assessed data from 1810 patients, measuring outcome changes in physical status, patient's knowledge and patient satisfaction. In the effort to improve the outcomes, changes in structure were implemented in the following areas: accessibility to nurses, nurse's attention to comfortable surroundings and sincerity of nursing staff. Researchers identified appropriateness of care procedures, patient-nurse interactions and patient participation in the care process as focus areas of improvement for process. Measuring reliability and validating for this study and use of the Donabedian model was confirmed using Cronbach's alpha for consistency and confirmatory factor analysis to validate the conceptual model hypothesis.

## Donabedian Model: Major Tenets

Dr. Donabedian visualized a linear prospective about healthcare change; "that structures affect processes, which in turn affect outcomes" (Mitchell, Ferketich, & Jennings, 2007, p. 43). The three major tenets of the Donabedian model are: Structure, Process and Outcomes.

### Structure

Structure not only incudes all the physical equipment and building but also the organizational characteristics of human resources. Examples of structure are types of pens, pencils, size of the paper, types of patient care monitors used, pamphlets given to patients and any teaching tools employed. This list can be added to further into types of chairs, background music played, number of forms and how displayed. As we exam the physical building, flow patterns of hallways, types of doors can be a consideration to whether automatic or manual, color of walls and doors, number of bathrooms and type assigned to each gender and cleanliness of the research center are all examples of structure.

Human resources also are part of structure with examples being: payroll systems, hours of operation, accessibility to nurses and other staff, wait times for services, audiovisual aids and telephonic services used by the entity. This is not intended to be a complete list. These examples of structure are also known as 'input measures' (ACT Academy, 2018).

**Process**

Process includes the care of the patient: the diagnosis, treatment and the care-seeking behavior. Changing process to effect outcome can be in the teaching of staff, either new ideas and theories or maintenance of already acquired knowledge. Process changes can come from provider staff, improving their actions or knowledge of patient care. Improvements in patient care outcomes can come from professional and non-professional staff. Examples being housekeeping staff decreasing infections due to training on new cleaning equipment (Casini et al., 2018). Patients can also be an integral part of change, changing the process of how patients' access, use or participate in their healthcare. Every level of the healthcare system can use processes to influence care and improve outcomes.

**Outcomes**

Outcomes are the desired effect of the changes made at the structure and process intervention. Outcomes should be measured and identifiability linked to the intervention. Outcomes can be measured by the patient knowledge, patient behavior, death or mortality rates, activities of daily living or satisfaction scores along with health status.

## Donabedian Model Application to QI project

This QI project will rely on leadership skills learned in the training of the DNP nurse to effect change using the Donabedian model (DM).

**Structure**

The structure identified for change is the preoperative teaching tool (PTT) used to disseminate the preoperative instructions. Changing this specific single page information sheet is measurable, relevant and achievable with the strong backing of the QI project site managerial stakeholders. Preoperative instructions are delivered via several methods to ensure patient compliance.

The PTT will be delivered to the patient at the time of informing the patient of the need of surgical intervention while visiting the physician office. Patients will be handed a single page PTT that contains the preoperative instructions to take home. At that time of delivery, a nurse or medical assistant qualified for preoperative instructions will reiterate the instructions and answer any questions the patient may have. The PTT will contain contact phone numbers for questions.

Patients will receive further follow up the day before surgery, by the ASC, to verify arrival time, procedure time, and compliance with preoperative instructions. This telephonic verification is completed by ASC nurses trained in preoperative instructions and the PTT. Timing of the follow-up is non-specific and completed throughout the day as daily work load allows for this task. There are no designated preoperative areas to conduct this business and calling will be completed from the general nursing station.

**Process**

Our change metric will detail new information for patients in the area of preoperative instructions. The required process will be a two-step process to implement the changes required to meet the outcome outlined in the QI project. The first process with be to train and instruct preoperative teaching staff the new guidelines outlined in the updated PTT. Staff members designated as preoperative teaching staff will be in-serviced to the updated PPT. The DNP candidate conducting the QI project will meet directly with preoperative teaching staff to review

the new guidelines on the PPT and to answer questions. This in-service will provide a format for the preoperative staff to ask questions and explore the new guidelines they will teach the patients. The in-service will require only the attendees to meet to review the PTT and can be completed at the convenience of the staff in almost any comfortable location.

The second process will be the preoperative teaching staff to instruct and teach patients the updated guidelines in the preoperative teaching tool. Preoperative teaching staff are located at both the physician's office and the ASC where the QI project will be conducted. Patients will initially receive instructions face to face from physician's office teaching staff. Follow-up to the PTT handout given by the staff at physician's office will be conducted by telephone teaching and verification of understanding the instructions by ASC teaching staff.

**Outcomes**

The desired outcome of the QI project is the decrease of DOSC. The outcome is measurable using the data collected at the QI site on a weekly basis: furthermore, the outcome is specific and not ambiguous. The managerial stakeholders agree the time line for change is appropriate, very relevant and achievable. The change or no-change in DOSC will be the measure for outcome, verifying or negating the belief that changes to the structure and process portion of the QI project.

## Project Design

This project has a QI design and will address the issues of reducing the day of surgery cancellations and adherence to preoperative surgical instructions. The project is designed as a QI project because it is a system wide practice improvement process that can continuously lead to measurable improvements for stakeholders. Silver et. al., (2016) describe the QI as a collaboration between stakeholders and health care staff to diagnose and treat a described

problem in the system. The population of interest will be preoperative teaching providers who will instruct patients on preoperative preparation. The preoperative teaching providers will reduce the rate of surgical cancellations by using an updated preoperative teaching tool that incorporates the latest evidence-based practice. Reasons for cancellation of cases varies, with NPO status believed to be the leading cause, patients perceive a conflict with instructions from anesthesia providers need for NPO and GI physician need for preoperative medication. To address these example, the preoperative teaching providers will outline NPO requirements that do not conflict with GI prep medications requested by the GI physician, eliminating a source of confusion for patients. The surgical center owners and manager have endorsed the QI project and have asked staff members for their cooperation in this QI project. In accordance with federal regulation, since the project will have no direct patient involvement, should be exempt from internal review board oversight (Protection of Human Subjects, 2018).

The success of the QI project will be the measured by the decreased rate of surgical cancellations, as measured by comparing cancellation percentages: pre-intervention and post-intervention. A McNemar's test will provide the statistical data to prove or disprove our teaching tool was significantly effective in reducing day of surgery cancellations. A statistician will be consulted to advise and review primary analysis to determine if secondary analysis is warranted.

**Setting**

The facility, an ambulatory surgery center (ASC), where the QI project will be conducted, is located in the southwest portion of the United States. The project site approval documentation is located in Appendix B. ASC ownership is 49% physician and 51% ownership by a national healthcare management company. Physician owners are required to perform cases at the ASC,

non-owner physicians are permitted to practice at the surgery center but outside sole investment is prohibited. While the national management company provides large scale support in accounting and maintaining regulations, the daily operational control is left to the local owners. Currently, the ASC has four procedural rooms, six preoperative bays and seven postoperative patient recovery bays. This ASC can function as a multi-specialty day surgery center but currently limiting procedures to colonoscopies and esophagogastroduodenoscopy (EGD). Patient demographics for colonoscopies are usually over age 50 for routine screening or any age where cancer is suspected. Demographics for EGD's are usually 30-50 years of age for diagnosis of reflux. The average number of procedures per week is 250.

**Population of Interest**

**Preoperative Teaching Providers.** The preoperative teaching providers (PTP) consists of 11 registered nurses (RN), eight medical assistants (MA) and three administrative staff personnel. The PTPs are responsible for instructing the patients on the proper preparation during the preoperative visit. The QI project will focus the intervention of improving the preoperative teaching tool with these 11 staff members. The administrative staff and one RN are employed and work at the surgical center, while the remaining staff are employed by the GI physicians and work in their private offices. The cooperation of the PTPs in updating and utilizing the preoperative teaching tool is being supported by the employers. The PTPs will not receive any incentive for participation in the QI project. All preoperative teaching staff employed by the surgery center and owner physicians will be included in the QI project. The exclusion consists of temporary staff, staff not employed by the ASC, or staff employed by non-owner physicians.

**Stakeholders**

Meyer and O'Brien-Pallas (2010) state that stakeholder buy-in is essential to change healthcare systems and to continuously monitor performance. Throughout the QI process, this DNP student has scheduled weekly meetings to discuss the progress, planning and concerns of the stakeholders. Stakeholders are vested in this QI project because, cancellations of cases waste resources in provider time, contributes to poor staff utilization and adds to patient frustration at perceived lack of service (Yu, Xie, Luo, & Gong, 2017).

**Credentialed Professional Service Staff.** Credentialed professional staff (CPS) are identified as GI physicians and anesthesia providers. CPS who provide services at the surgical center, have an interest in decreasing the number of cancellations. As fee-for-service professionals, canceled cases are an inefficient use of their time and decrease their income. From the onset of this QI project, the CPS concerns and thoughts have been paramount in developing the preoperative protocol to effect the desired change. The DNP student works closely with this staff on a daily basis, discussing progress, ideas and thoughts for improving the QI process. The DNP student's open availability with the staff has encouraged the physicians and CRNA's to bring new ideas to the DNP student at any time.

**Surgery Center Owners and Managers.** The owners of the surgical center, employ staff at a paid hourly rate, regardless of patient workload. Decreasing the cancellation rate would increase productivity of the staff, thus increasing revenues. Day of surgery cancellations can be costly with estimates ranging from $5048.80 to $7,748.60 (Fitzsimmons, Dilley, Moser, & Walker, 2016; Sebach, Rockelli, Reddishj, Jarosinski& Dolan, 2015). Owners and managers of the clinical site where the QI project will be conducted can foresee the benefits of this project and have given permission and their support to conduct this improvement project at their facility. The DNP student has attended monthly medical executive meetings to discuss the

benefits to the stakeholders and requirements of staff, and providing updates on the progress of the QI project.

**Patients.** There will be no direct patient care provided to the patients. The patients, as stakeholders, will be secondary beneficiaries of this QI project, through decreased surgical cancellations.

### Recruitment Methods

**Preoperative teaching providers**. The preoperative teaching providers are employed by either two stakeholders: the ASC or by the GI physician. Both of these stakeholders have strong beliefs and investment into the QI project and will mandate the implementation of the QI project, as part of policy and improvement for the staff. The stakeholders have stated they will mandate the implementation of the updated preoperative instructions put forth in this QI project as a system level change policy. Educational training in the new preoperative teaching tool will be during normal working hours by the DNP student. There will be no additional pay incentive for staff, training will be conducted during normal business hours, and staff will receive their regular pay per hour for the time. There is no privacy or confidentially concerns in regards to the educating the staff.

**Patient charts**. All patients' chart will be included in the data collection during the specified data collection times. Any patient charts seen outside of the specified data collection time will be excluded.

## Tools/Instrumentation

### Preoperative Teaching Tool

Researchers boast the reduction in last-minute surgical cancellations can be attributed to effective preoperative teaching using new evidence-based re-designed tools and admission

pathway (He et al., 2018). The development of a preoperative teaching tool will be a collaboration between GI physicians, the anesthesia care team and surgical center management. GI physicians will provide bowel preparation regiments for patients, so their requirements can be taken into consideration when detailing the NPO policy. Anesthesia providers will agree and provide the best practice NPO status for center patients. Surgical center management will provide patient administration requirements for day of surgery. The conditions from each specialty will be complied into a single page preoperative instruction sheet to be given to each patient. A copy of the preoperative teaching tool is available in Appendix C.

**Staff Educational Tools**

**Educational Checklist.** The PTPs will be educated to the changes of the preoperative tool by the DNP student. To ensure that every staff has been trained and understand the teaching tool, an educational checklist form will be completed for each staff member and submitted to management stakeholders along with this written QI project. The staff educational checklist in located in Appendix D. The checklist will allow the preoperative teaching providers and the DNP student to discuss the changes to the preoperative teaching tool, have the staff verbalize the understanding of the changes, allow a question and answer session and review the steps to instruct patients in the preoperative preparation. Staff understanding is important, as Fitzpatrick and Hyde (2005) stated, the content and quality of information given to the patient is largely reliant on the team member who gives that information. Checklists for learning promote proactive and collaborative team communication and reduce the numbers of miscommunications (Lingard et al., 2008). This checklist will be used for tracking of staff members competed versus not completed the training, and will have no effect on staff evaluation by the DNP student or this

QI project. The completed staff educational checklists will be secured maintained at the ASC by the management stakeholder.

**Preoperative teaching protocol**. A preoperative teaching protocol was developed to guide the PTPs in accurately completing the updated preoperative instruction sheet to be given to the patient. A copy of the preoperative teaching protocol is located in Appendix E.

**Data Collection Tool**

Cancellation data will be collected on a weekly basis and complied on a data collection sheet. Canceled cases will be assigned a sequential number and the following information will be logged: the referring physician, date of scheduled surgery, date of cancellation, and reason for cancellation. Any case not canceled the same day as scheduled surgery will not be logged as a canceled case into the data collection tool. Allison et. at., (2000) caution that chart review can be more difficult than appears and suggest identifying specific, easy to measure variables to avoid compromising data quality. Data collected will limited to only the four items listed on the collection tool and no personal health information will be collected. A copy of the data collection tool is available in Appendix F.

## Data Collection Procedures

Data collection will be completed by the DNP student by personally reviewing the charts of canceled patients for the week. Administrative staff at the surgery center will print a report of canceled cases for the week. Historically, the surgical center has had an 11-13% cancellation rate, or 27-32 canceled cases per week. In the surgical center office, on an approved password protected computer, an excel spreadsheet of the data collection tool will be utilized and stored on the hard drive. Without removing the cancellation report produced by the administrative staff, charts will be reviewed within the confines of the surgical center and returned to protected

storage immediately after review and the cancellation list placed in approved document shredding device. For privacy and Health Insurance Portability and Accountability Act (HIPPA) compliance, no protected health information will be collected. Patient charts included in the cancellation group of the QI project will be assigned a number in place of their name.

A pre-intervention assessment of the cancellation rate will be completed, prior to the introduction of the preoperative teaching tool. For two weeks prior to the start of the intervention, cancellations rates will be collected in the same manner as described above. This rate will be considered the pre-intervention cancellation rate.

Following the completion of the two week pre-intervention assessment, the preoperative teaching staff will be instructed to begin using the new preoperative teaching tool. After a four week intervention period, in which the new preoperative teaching tool has been in place, a post-intervention assessment of the cancellation rate will be completed. The data collected will be in manner described above and in the pre-intervention assessment. Post-intervention data will be collected for two weeks and will be considered the post-intervention cancellation rate.

## Intervention/Project Timeline

This QI project was completed in sections with the first section including the introduction, background, development of: problem statement, purpose statement, and the project question. Developing the project scope and purpose included discussions and collaborations with project mentor and clinical site leadership and was completed in five weeks, in November, 2018. Understanding the problem and possible solutions was completed through a literature review and designing a conceptual framework over a six week period concluding in December 2018.

Obtaining the approval for implementation of the proposed project concluded with a presentation of the proposed project, the intended benefits, and the required collaboration with ASC personnel, to the ASC management stakeholders in February 2019. Implementation approval was obtained from Touro University Nevada at the end of June 2019. With the management stakeholders supporting the proposed project, recruitment and training of the participants will be completed in seven days; projected date is the first week of July 2019.

Implementation of the proposed project will be a four-week phase, with projected completion in week five. Data collection will include an assessment of the rate of DOSC, prior to intervention and post intervention, during weeks one and six, respectively. Analysis of data collection will be concluded in week six, with post QI review discussing finding, ways to improve and elicit feedback during weeks seven and eight. The dissemination of the final QI project finding, to colleagues and Touro University instructors will be in week 14. This structured approach to the QI project will encompass 12 months from beginning to completion. A structured approach to problem solving and development of a QI project has a greater chance of success an being implemented, than an unstructured approach (Donnelly, 2017).

Table 1

*Intervention / Timeline*

| Major Process Objective | Responsible Party | Process Participants | Completion Date (actual or projected) |
|---|---|---|---|
| Pre-Intervention assessment of DOSC | DNP Student | DNP Student | July 2019 Week 1 |
| In-service Preoperative Teaching Providers, Six intervention sessions | DNP Student | DNP Student, Preoperative Teaching Team | Week 1 |

| | | | |
|---|---|---|---|
| Four Week Intervention of New Preoperative Instructions | DNP Student, Preoperative Teaching Staff | DNP Student, Preoperative Teaching Staff | Weeks 2-5 |
| Post-Intervention Data Collection | DNP Student | DNP Student | Week 6 |
| Statistical Analysis of Data | DNP Student | DNP Student, Statistician | Week 6 |
| Post QI intervention meeting to discuss findings, elicit feedback and discuss possible areas of improvement | DNP Student, Project Chair, Project Member | DNP Student, Project Chair, Project Member, ASC Stakeholders | Week 7 or 8 |
| Dissemination to Colleagues and TUN Instructors | DNP Student | | Week 14 |

## Ethics and Human Subjects Protection

To determine the degree of ethical concern, possible need for protection of participants, and need for oversight by an Internal Review Board (IRB), we must examine the scope and limitations of the proposed project. The following project is a QI project with no direct interaction with patients. Population of interest will be preoperative teaching staff only and data collected from patients' charts will have any PHI removed. Berman, Raval, and Goldin, (2018) state a QI project does not need approval from IRB nor informed consent from patients. Several articles, specifically Finkelstien et al., (2015); and Pletcher, Lo and Grady, (2014), cautioned clinicians that research and QI can overlap, causing confusion about the need for ethical oversight. To address the concern of possible overlap, this project was reviewed by ASC management stakeholders, ASC owner stakeholders and this DNP students project team, from Touro University Nevada. The determination of the project by the reviewers was the project is a QI project without research and would be exempt from IRB and the need for patient consent. A

copy of the letter from the ASC management and ASC stakeholders' determination of IRB requirements (See Appendix G).

The employers of the preoperative teaching staff have expressed a desire to implement the QI project and have instructed their staff to participate. There is no risk for the staff to participate in this project. There will be no benefit or compensation for participation in the QI project for the population of interest. Participation is not a condition of employment.

Patient data will be collected at the ASC through approved methods to protect patient information and will be collected by the DNP student only. The patient data will be collected for statistical analysis of cancellation rate but the patients are not project participants. Privacy for patients will be maintained, information will be anonymized and no PHI was collected. Sakar & Seshadri (2014) stressed the need for a systematic approach in regards to collecting data to prevent errors and possible breech in patients' privacy. The DNP student developed a data collection tool to prevent collection errors and provide a systematic approach to data collection (See Appendix E).

## Plan for Analysis/Evaluation

The QI project outcome will be measured by the effectiveness of the new preoperative teaching tool on the impact of DOSC. To understand the effectiveness of the intervention, cancellation rates 'pre intervention' and 'post intervention' will be analyzed with the aid of the Statistical Package for the Social Sciences (SPSS) program. A non-parametric statistical test, McNemar's Test is warranted when a pre-test/post-test to measure the impact of an intervention is desired (Pallant, 2013). The McNemar's test requires a categorical variable to be measured at two different times. The categorical variable measured will be: case canceled? yes=1, no=2. Measured times will be pre and post intervention of the use of the preoperative teaching

tool. The advantage of the McNemar's test is that is does not measure independence but tests for consistency of responses (case canceled) after an intervention. The McNemar's test is excellent for two different time points (pre/post intervention), (Mangiafico, 2016).

The assumptions for the QI project were that the rate of DOSC could be decreased through better preoperative preparation of patients. The QI site stakeholders believed cases canceled consisted of two broad categories: patients not understanding the instructions and inappropriate selection of patients for an ASC. In researching the design of a preoperative teaching tool with the ASC staff, this DNP student realized a varying degree of understanding and accepting new national guidelines regarding NPO status, thus leading to inconsistent decision making of acceptable NPO status. Involving the staff in developing the preoperative teaching tool, had the secondary effect of bringing the latest evidence-based practice to both anesthesia providers and GI physicians regarding NPO guidelines. A preoperative teaching tool for the patients, outlining and clarifying these specific points would address the issues of poorly prepared patients, thus reducing cancellations. If the DOSC cancellations can be reduced by the proposed QI project, then the assumptions of better prepared patients reduce DOSC is accurate, this will be either be proved or disproved by the statistical analysis.

## Significance/Implications for Nursing

The focus of the QI project was to better prepare patients for day of surgery to prevent cancellations. Canceling procedures on the scheduled day impacts all stakeholders: loss of revenue for the ASC owners, loss of time and potential earnings for professional staff, and loss of time and emotional distress for patients. Review of scholarly literature identifies DOSC as a significant problem worldwide and offers many potential solutions for improvement (Allison & George, 2014; Bernier, Sanares, Owen & Newhouse, 2003; Souzdalnitski & Narouze, 2017;

Turunen, Docent, Serälä, & Vehviläinen-Julkunen, 2017). Moran & Johnson (1992) discuss the nurses' role as a continuous concept of service improvement that includes: quality assurance, problem resolution, quality improvement. Arndt & Netsch (2012) discuss the nurses' role in a QI project as to understand the problem and improve the patient outcome or process. Nursing leadership bringing evidence-based changes through QI projects, shows the core values of leadership, collaboration, and policy development that benefits all stakeholders. The Agency for Healthcare Research and Quality (AHRQ) supports QI projects as a goal for not only improving nursing care but also improving healthcare systems to benefit patients (Agency for Healthcare Research and Quality [AHRQ], 2018).

## Analysis of Results

To understand the intervention effectiveness of a structured preoperative teaching tool to decrease the rate of cancelations, data was collected at two points: prior to the intervention and four weeks after the intervention. The QI project is designed to test paired data from the two collection points using a McNemar's test. Reviewing the limitations of the QI project time constraints within the academic calendar, the application of McNemar's would produce inaccurate results. In discussions with the university's Institutional Review Board (IRB) chair, selection of an alternative test, Fisher's exact test will be employed (Cheryl Vanier, Ph.D., IRB Chair, personal communication, August 6, 2019). The time constraints and academic limitations will be discussed further in the discussion portion of the project paper. A Fisher's exact test of independence is employed for two nominal variables, to compare the proportions of one variable depending on the value of the other variable (McDonald, 2015). The strength in the Fisher's test is that the calculation is not based on probabilities of distribution but on factorial formula, this allows a 2x2 association to be employed during low numbers of sampling, as is the case with the

QI data (Williams & Quave, 2019). The Fisher's test will provide a statistical value of significance, reported as a p-value, this result will be further supported by calculating the percent cancellation and 95% confidence levels, pre and post intervention.

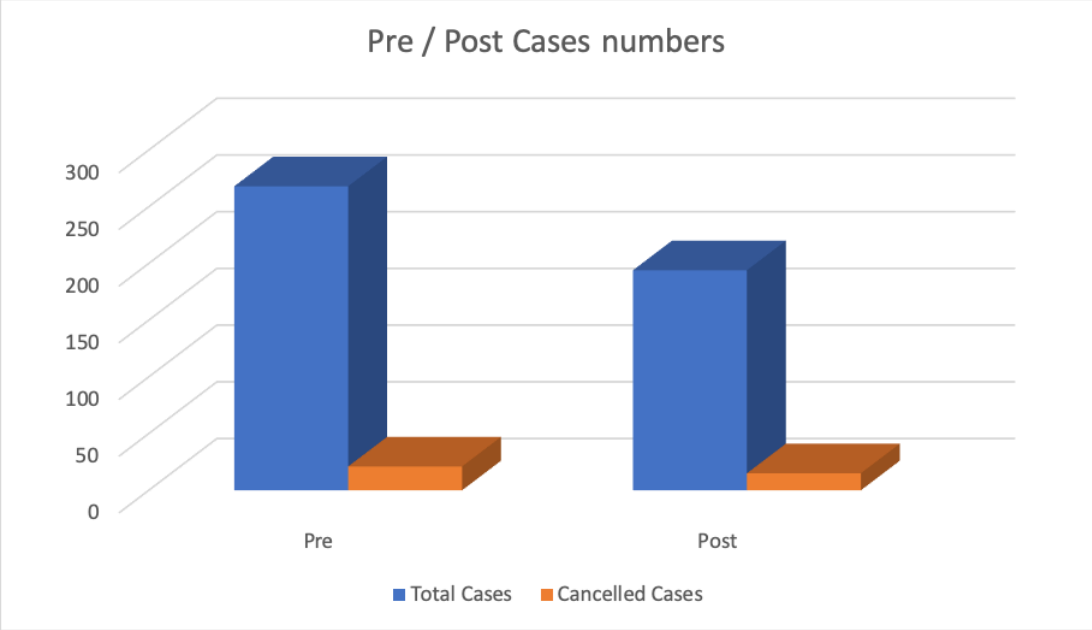
Prior to data analysis, several assumptions were assessed for possible violations. Assumptions for this QI project were that the data retrieved would be sample representative, nominal data, paired, non-biased and include the assumption of independence. The design of the data collection would be that the sample data taken during the collection, would be reflective of the overall population, this proved to be false, and a violation. The information collected was designed to be nominal, which was true and not a violation. Data collected was designed to be paired, intervention subjects would participate in both pre and post intervention, this was not true and a violation for the McNemar's test, which prompted the change to a Fisher's Exact test which does not require paired data. There was no bias noted in the design of the collection of data, subsequently no violation regarding this issue. Kim (2017) noted that if the assumption of independence is violated, Fishers exact test cannot be used, since a single subject produced more than one observation in the calculations, there were no violations of independence for the data.

Table 2

*DOSC Data Pre and Post Intervention*

| | Pre-Intervention | Post-Intervention |
|---|---|---|
| Number of Total Cases | 268 | 194 |
| Number of Canceled Cases | 21 | 15 |
| Cancellation Rate | 7.8% | 7.7% |

Figure 1. Total cases with corresponding cases canceled




Data collected for cancellation not only included the day and time of the cancellation, but also the reason given for cancellation. Reasons for day of surgical procedure cancellations were as follows: cost, patient was unable to pay the required payment for services; patient re-scheduled day of procedure, patient called into the ASC the day of procedure and rescheduled for another day; illness, patient called into ASC for cancellation complaining of an unrelated illness; no prep, patient did not properly follow the preoperative medication instructions or NPO instructions for procedure; no show / no call, patient did not call to cancel, nor show up to the ASC for their appointment; medical cancellation, patient arrived to ASC and was canceled for medical reasons prior to procedure. Table 3 shows the comparison between pre-intervention and post intervention rates of the cancellation reasons.

Table 3

*Reason for Cancellations*

| | Pre-Intervention | Post-Intervention |
|---|---|---|
| Cost | 1 | |
| No show | 8 | 13 |
| Re-Scheduled day of procedure | 3 | |
| Illness | 2 | |
| Did not follow Pre-op Instructions | 4 | |
| Medical Cancellation | 3 | 1 |
| | | |
| Totals: | 21 | 15 |

Determining the p-value using the Fisher's exact test for independence: $p = 1.0$. The association between the pre and post intervention groups and the rates of cancellations are not statistically significant (2x2 contingency table, 2018).

Calculating the confidence interval of the proportion, with 95% confidence interval, to include continuity correction (Interval of a proportion, 2019):

Table 4

*Confidence Levels*

| | | 95% Confidence Interval | |
|---|---|---|---|
| | Proportion | Lower Limit | Upper Limit |
| Pre-Intervention | 0.078 | 0.050 | 0.119 |
| Post-Intervention | 0.077 | 0.045 | 0.126 |

The confidence interval calculations support the Fisher's calculations report of: non-significant change between the two groups of data, pre / post intervention.

The primary analysis of the data shows a non-significant change in the cancellation rates between pre-intervention and post-intervention. Curran-Everett and Williams (2015) caution that "percent change is really just a ratio, and a ratio is infamous for its ability to mislead" (p. 50). Examining table 3, the change that is most notable, is the lack of cancellations in areas that were targeted by the standardized preoperative instruction format: unacceptable pre-procedure medical conditions, knowledge of cost of procedure (and payment), and not following preoperative preparation instructions. Reyna, Burger and Cho (2017) reinforce the knowledge that QI projects require intelligent direction, strategic planning, and skillful execution but that does not always produce the expected results but may led to developing the next QI solution.

Reviewing the project question and objectives: Are preoperative surgical patients, who are given standardized preoperative instructions prior to surgery, compared to preoperative patients historically not given standardized instructions, less likely to have their cases canceled over a six weeks period? The QI project met three of the four objectives and could not validate the project question. Success in the project was effective in producing collaboration within the healthcare team responsible preoperative teaching. These healthcare providers produced a preoperative teaching protocol that was beneficial to the patients, as indicated by the decrease in cancellation in preoperative preparedness. The standardized preoperative instruction protocol failed to meet the goal of a decrease of 15% in the DOSC, but made strides in preoperative preparedness of patients.

## Discussion of Results

The focus of the QI project was to better prepare patients for the day of surgery, to decrease the rate of same day cancellations of GI surgical procedures. The initiative behind reducing cancellations was both financial and personal / emotional benefit for all involved: ASC

stakeholders, staff and patients. The initial data showed no improvement in the rate of cancellations, indicating an unsuccessful accomplishment of reducing DOSC. Looking further into the data, pre-intervention cancellations were divided among several reasons: cost, no-show, re-scheduled, illness, not following instructions and pre-existing medical cancellations. Post-interventions were divided into only two groups: 13 cases of no-show and one case of pre-existing medical disease cancellation, with the medical cancellation being from new onset seizures the previous night. Although not a significant reduction in the rate of overall cancellations, cancellations from knowledge of procedural cost, last minute re-scheduling, not following preop instructions and preexisting conditions went from 11 cases to one case. The goal of better preparing patients by standardized education could be inferred to be successful, considering the reduction of these types of cancellations.

Cancellations due to unrelated sudden illnesses are considered difficult to impossible to control and are accepted (Boudreau & Gibson, 2011). The most common reason for cancellation were patients not showing up to the ASC for their procedure, nor calling ahead to cancel. Had the patient called ahead and canceled or re-scheduled, they would be categorized into the re-scheduled group. The no-show group of cancellations is inherently difficult to assess the reasons behind the cancellations, due to the lack of communication with the patient (Mehra et al., 2018). Discussing the no-show rates with the GI physicians at the ASC, they speculate that most no-show cancellations are a result of ‘open-access’ scheduling of patients. Open-access patients do not visit with the GI physician prior to their GI procedure but are scheduled by their primary care doctor, into a ‘open availability’ time slot. The speculation is that these patients do not benefit from the GI physician’s explanation of the importance of following through with the procedure, thus are more likely to no-show. No-show cancellation rates have been consistently

reported as significant reasons for cancellations: Sultan, Rashid and Abbas (2012) reported no-show cancellations rates of 7.4%, as well as Chiu, Lee and Chui (2012) of 9.8%, which are consistent with this QI project reported cancellation rates. Researchers have developed a risk indicator assessment protocol to identify patients who were high-risk of no-show cancellation, using this tool, identified patients received additional preoperative staff interactions to successfully reduce no-show behavior (Shah et al., 2016).

An unforeseen event that impacted the data collection and analysis of the QI project, was the personal time off (PTO) of the physician providers. Several of the GI physicians were absent during the pre-intervention data collection, while other providers were absent during the post-intervention data collection. The QI project intent was to improve and standardize the teaching protocol of the individual office preoperative teaching staff, the impact of the intervention could not be linked to a specific office when an office did not participate in both pre and post intervention data collection due to physicians not providing services.

The QI project had success in the multi-disciplinary collaboration needed to design and implement the DOSC intervention. Many healthcare providers at the ASC, had not previously participated in a collaborative effort to improve patient care. Interdisciplinary collaboration is challenging, the investigator must not only know the strengths and limitations of their own discipline but must understand the education, scope of practice and areas of expertise in the other team members' disciple, as well (Jakubowski & Perron, 2018). Nursing leadership, from the ASC director where the QI project was implemented, helped to define the roles of the various providers and provided a professional environment that brought together meaningful collaboration. Registered nurses have the skill, compassion and knowledge to assume roles not only as effective bedside caregivers but management leadership positions as well (Smolowitz et

al., 2015). Corporate healthcare management recognize nurses as essential caregivers that can significantly influence the quality of patient care through leadership, consequently, nurses are essential to successfully implementing a QI initiative (Draper, Felland, Liebhaber, & Melichar, 2008). The ASC corporate management supported and endorsed the QI, the first of its kind at the facility.

## Significance/Implications for Nursing

QI projects and initiatives are not without cost. In a private-sector healthcare organization, where profit is a goal, there may be resistance to allocating resources that may not show immediate profitability. As a stakeholder and patient advocate, nursing administers must validate the cost and benefit of QI projects, not only for the betterment of the staff but also improve patient care. Through the efforts of the nursing stakeholders, QI projects can improve patient care, productivity and ultimately, benefit the facility financially. Staff working at the ASC, can also benefit financially by increased workload that can initiate growth in services and personnel. Direct cost savings by a successful QI project can be highly variable, depending on the project, but improved healthcare at the same cost is a successful endeavor. Improved healthcare delivery, represented by consumer surveys and patient treatment outcomes can be directly linked back to the health of the organization and an indicator of nursing excellence (Witkoski-Stimpfel, Sloane, McHugh, & Aiken, 2015). Nursing, both bedside and managerial, are interested in providing greater healthcare for patients by decreasing the cancellation rates of procedures demonstrate the commitment of nursing to provide improved delivery of healthcare. Patients and nursing staff are not the only beneficiaries of a QI project, improvement projects can improve the health, teamwork, and collaboration of an organization by their very nature, building respect, understanding and knowledge between team members. Investing in the

future care of patients through QI projects can be beneficial to all stakeholders, with some showing immediate financial gains, while other improvements: in teamwork, employee satisfaction and improved consumer review scores, not being as evident (Mery, Dobrow, Baker, Im, & Brown, 2017). This nursing led QI project was a first step in developing a long term professional collaboration between team members that was not present previously, showing leadership and initiative by nursing to not only improve healthcare of patients but increase the financial health of the facility.

## Limitations

The problem of DOSC is a worldwide problem with new approaches for solutions and improvement projects being constantly developed, to lower the impact of canceled surgeries (Cho, Lee, Lee, Kim, & Kim, 2019). Huda (2014) identifies several common reasons for the cancellation of cases, but notes that most could have been foreseen and avoidable. Advisory Board (2012) reported preoperative evaluation of patients with anesthesia personnel decreased DOSC by 50%. The incidence of DOSC cancellations in our QI projects was identified as inadequate preoperative evaluation and instructions, the limitation of correcting this issue was the fractured nature of the design of pre-operative clinics: each private practice GI physician had their own preoperative team. Ideally, all pre-operative instructions and evaluation would be re-designed to a central location, directed by a single management team to be most effective (Irizarry-Alvarado et al., 2019). The re-design of all preoperative clinics was not feasible in this QI project. To reach the goal of DOSC improvement, emphasis shifted to redesigning of the preoperative instructions, attempting to standardize what information was given to each preoperative patient. The lack of a central management entity responsible for overseeing and supervising the preoperative teaching clinics made the adherence to the new guidelines and

preoperative teachings variable between the individual office staffs. The importance of the multidisciplinary participation cannot be over emphasized; as variables, both professional and personal agendas impact the level of involvement of each team member (Dirks, 2019). Participation in this QI project was essential for building important professional skills that relied on collaborative team work to support and make the project successful (British Medical Journal [BMJ], 2019). The lack of a central preoperative clinic, under a single management structure, was a limitation that was partially overcome by the positive collaboration with GI physicians, who incorporated the new preoperative protocols into their individual practices.

The structured timeline to complete the QI project impacted several areas of the improvement project that was not foreseen. The data collection was designed for a single week for pre-intervention and a single week post-intervention, this proved to be an inadequate amount of time. The goal of data collection was to compare not only the rate of cancellation change overall for the ASC but to identify the rates of change per physician, and subsequently their teaching staff. Several physicians were on PTO during the pre-intervention data collection, while others were on PTO during the post-intervention data collection time. The PTO prevented paired data and accurate analysis of the intervention. The PTO taken by the GI physicians during data collection times also impacted the type of data analysis employed. The project design was to employ the McNemar's Test for data analysis, but proved to be unsuitable when the data could not be linked pre and post intervention to specific physician office preoperative preparation. A suitable replacement data analysis that did not require paired data was chosen: The Fisher's exact test. Although, the Fisher's exact test provided adequate data analysis on the overall intervention, the analysis was unable to identify successful individual

office staff versus office staff possibly lagging behind (Preacher, 2019). Ensuring the accuracy and appropriate data collection for analysis is vital to prevent misrepresenting the findings and possible negative outcomes to policy recommendations (Responsible Conduct of Research [RCR], 2015). The limitation of data collection and analysis was overcome by selecting an alternative analytical method; this change preserved the data integrity and eliminated possible errors in the interpretation of the analysis.

## Project Dissemination and Sustainability

This QI project will be disseminated through the preoperative teaching protocols developed and tools designed for its implementation. The tools and protocols created during the QI project have been accepted into practice at the ASC and the six individual physicians' offices as the current standard. These protocols and tools created are at the current national standard of care for NPO fasting, meets standards for preoperative instructions at an ASC, and can be modified at the need of the ASC or as best evidence-based practice dictates. The QI project decreased the DOSC for many subgroups of cancellations and despite not showing an overall decrease in cancellations, the ASC stakeholders considered the project successful. The success of a project, whether through productivity or outcome change, can be measured in many ways, with some not realized until the project is finished (Ehrenfeld, Dexter, Rothman, Johnson, & Epstein, 2013). The process brought several specialties together to work in collaboration for the first time on an improvement project, which management stakeholders welcomed. Partnerships in QI projects, when carefully selected and nurtured, can have lasting impact on success of improving healthcare (Boratgis et al., 2007). The QI project decreased rates of cancellations in all categories except no show / no call cancellations. The analysis of this project identified the

high rate of no show / no call cancellations, that were previously unrecognized, this fact has been the topic of a proposed future QI project by stakeholders.

The project information will be transformed into a PowerPoint slide show to inform ASC stakeholders of the QI process and outcome. The QI project delivery to the ASC will include the PowerPoint presentation along with a question and answer session during the monthly board meeting. The PowerPoint slide show, outlining the project, will also be used to inform and educate faculty, staff and students at Touro University through a formal delivery of the project via Zoom video conference call. In an effort to reach wide spread delivery, the QI project will be summarized into a poster presentation for the annual American Association of Nurse Anesthetist national anesthesia conference. An unabridged version of the writing of the QI project will be submitted to the Doctor of Nurse Practice: Doctoral Project Repository for future academically interested researchers to have access to this project (https://www.doctorsofnursingpractice.org/doctoral-project-repository/).

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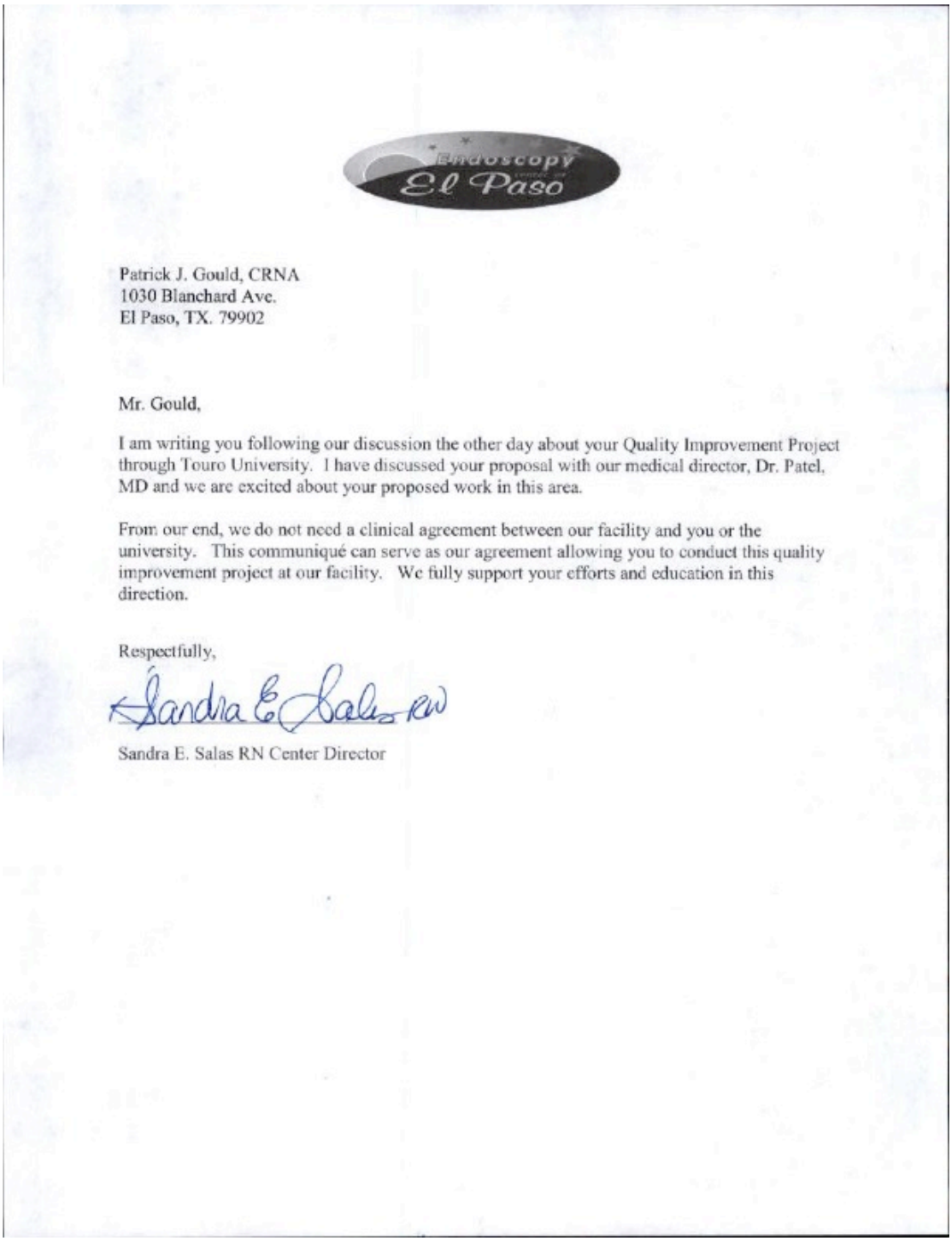
Appendix A

The Donabedian Model


*Figure 1.* Donabedian Model. Adapted from Principles underlying the development of clinical guidelines, clinical effectiveness and quality standards, and their application in health and social care, by HealthKnowledge, 2018, Retrieved from https://www.healthknowledge.org.uk/content/principles-underlying-development-clinical-guidelines-clinical-effectiveness-and-quality.

Appendix B

Clinical Site Agreement Letter



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El Paso, TX. 79902

Mr. Gould,

I am writing you following our discussion the other day about your Quality Improvement Project through Touro University. I have discussed your proposal with our medical director, Dr. Patel, MD and we are excited about your proposed work in this area.

From our end, we do not need a clinical agreement between our facility and you or the university. This communiqué can serve as our agreement allowing you to conduct this quality improvement project at our facility. We fully support your efforts and education in this direction.

Respectfully,

Sandra E. Salas RN

Sandra E. Salas RN Center Director

Appendix C

Preoperative Teaching Tool

# El Paso Endoscopy Center
# Patient Pre-Procedure Instructions

You have been scheduled at El Paso Endoscopy Center at 1300 Murchison Dr. El Paso 79902. We look forward to seeing you soon. Below are some instructions to guide you for your upcoming procedure.

Preparation: You must have an empty stomach, so nothing to eat for at least eight (8) hours before the procedure. You may have 'clear liquids' up to three (3) hours before your procedure. Examples of **clear liquids** include water, fruit juices without pulp, clear carbonated beverages, **clear** tea, and black coffee. If you get very thirsty, you can have small sips of water for comfort, but do not take anything else. Your physician office will instruct you on your specific bowel preparation needed, which may increase these non-eating / non-drinking times. Your physician's instructions do not conflict with the following instructions, if you have any questions, please consult your physician's office.

Implanted Cardiac Device: If you have an implanted cardiac device (pacemaker, defibrillator or loop recorder), please bring paperwork verifying what the device is. The device paperwork you were initially given upon implantation will provide the information needed. If you have a defibrillator or a combination cardiac pacemaker/defibrillator – please call your physician's office to inform them – you will need to be rescheduled at a different health care center other than El Paso Endoscopy Center. Pacemakers and loop recorders are acceptable for procedures at the El Paso Endoscopy Center.

Antibiotics: If you are currently taking antibiotics – Please continue your antibiotics and not interrupt your doses for the procedure. Also, please notify your physician's office that you are taking antibiotics.

Medications: Do not interrupt your medications during your preparation for this test. You can take all of your medication (except blood thinners) with sips of clear fluids.

> Blood Thinners: Instructions to stop your blood thinners will be given to you at your physician office – these are important to follow. Depending on the medication you are taking, you will stop your medications three (3) days, five (5) days or up to ten (10) days prior to your procedure. Please follow the instructions, as these are very important.
>
> Asthma: Please bring your inhalers with you on the day of your procedure.
>
> Pain: If you have pain, take Tylenol or your prescribed pain medication for the 7 days prior to the procedure and up until the day before the exam.

Diabetic: If you are a diabetic, take only ½ the doses of your usual medication intake , this includes insulin the day before the exam when on a liquid diet and laxatives. If you take glucose tablets, these are permitted the day before. Make sure you monitor your blood sugar carefully while preparing for the procedure.

Other Instructions: Please bring a list of your medications with doses, strength and amount you take with you on the day of your procedure. Please do not wear jewelry, contact lens or bring valuables with you on the day of your procedure.

Thank you very much

Appendix D

Educational Checklist

Staff DOSC Checklist

Staff: _____ date: _____

| Initial | Task |
|---|---|
| _____ | Review new preoperative instruction sheet |
| _____ | Verbalize understanding of changes in preoperative orders |
| _____ | Questions & answer completed with instructional team |
| _____ | Review protocol:<br>Each patient receives an instruction sheet<br>Staff to review each item on list with patient<br>Highlight specific items applicable to patient<br>(example: bring pacemaker card)<br>Staff provides question and answer session with patient. |

_____ _____

Staff signature / date Instructional staff / date

# Appendix E

## Preoperative Teaching Protocol


### El Paso Endoscopy Center
### Nursing - Patient Care Protocol
### Preoperative Anesthesia Protocol

**Policy/Purpose:**

The Pre-Procedure Anesthesia Protocol provides a general set of nursing instructions and orders aimed at the effective and safe preparation of a patient undergoing anesthesia care during a procedure. This protocol may be utilized under the direction of the department of anesthesiology for patient preparation during the GI physician pre-operative visit, the pre-surgery clinic, and procedural holding areas. These instructions are not exhaustive; anesthesia providers should be consulted for patient care conditions not described in this protocol.

**Instructions:**

1. Patients may be evaluated and optimized for surgery by the preoperative teaching providers in their primary care physician's office or by the ASC preoperative teaching nurses. The preoperative teaching providers will assess the patient to ensure the requirements of the anesthesia protocol are met.
    a. If there is a discrepancy between testing requirements in the anesthesia protocol and the tests ordered by another physician, the pre-surgery clinic nurses will ensure the required tests for anesthesia are completed along with other orders.
    b. If there is a discrepancy regarding medication instructions, the nurses will defer to the anesthesia protocol and may choose to consult an anesthesia provider for clarity.
    c. Surgeon preoperative order sets should be followed in addition to applicable orders in the anesthesia protocol.

2. Nurses will provide the following diet instructions:
    a. No solid food or milk products (including infant formula) after midnight.
        i. This includes gum, chewing tobacco and candy
        ii. Do not swallow toothpaste
    b. Clear liquids may continue after midnight up to THREE (3) hours prior to the surgery or procedure. Clear liquids include fat free vegetable, beef or chicken broth.
        i. Amount of clear liquids should not exceed 12 ounces within three hours of surgery.
        ii. If the surgeons' restrictions for NPO status are more stringent, defer to the surgeon instructions.

3. Diabetic patients: If you are a diabetic, take only ½ the doses of your usual medication intake , this includes insulin the day before the exam when on a liquid diet and laxatives. If you take glucose tablets, these are permitted the day before. Make sure you monitor your blood sugar carefully while preparing for the procedure.

4. Whenever possible, nurses will obtain interrogation reports for all surgeries:
    a. Pacemakers within the past twelve months.
    b. Internal defibrillators will require scheduling at a facility other than Endoscopy Center.

5. Discuss with patients planning for day of surgery – no jewelry, no valuables, bring medication bottles and ensure that patient had adequate transportation available

Anesthesia contact: (915) 613-0811

Appendix F

Data Collection Tool

## Data Collection for DOCS

week of:

| Patient assigned # | Date of surgery | Date of cancellation | Scheduling MD | Reason for cancelation |
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Appendix G

ASC IRB Determination

Endoscopy center of El Paso

Patrick J Gould, CRNA
1030 Blanchard Ave.
El Paso, TX 79902

RE: IRB Determination

Mr. Gould,

I have requested a review of your proposed QI project to be completed at our facility, for the potential requirement of Institutional Review Board approval.

The proposed QI project will strictly be implemented with our teaching staff and have no contact with patients. The proposed patient chart review meets our requirements for patient privacy protection. At this time, for the project you have proposed, we do not require IRB approval.

If your proposed project changes or amended in any fashion, this decision not to require IRB approval will be re-evaluated.

Respectfully,

Sandra E Salas RN

Sandra E. Salas RN, Center Director

Dr. Vinay M. Patel, Medical Director