Gaining Efficiency and Reducing Cost: The Re-design of a Preoperative Screening Clinic

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Abstract

Purpose: The purpose of this project was to focus on the redesign of the preoperative screening clinic (PSC) at a 410-bed acute care facility. The process change took place at a healthcare facility where surgical volume has been growing annually since 2011, with an average growth rate of 3% per year. The facility has projected business plans to add capacity for 6 operating rooms in the next three years due to the increased growth. The organization needed the ability to support continued surgical growth prior to the development of adding operating rooms. Understanding the current PSC operations with the need to support future growth, was the motivation for the development of this project to redesign the PSC operations.

Methods: A literature review was preformed prior to the development of a plan for change in the PSC. This project is based on using an all registered nurse (RN) group to staff the prescreening clinic for patients needing anesthesia services. The intent was to demonstrate reduced day of surgery cancellations. To complete this process, specific nurse assignments with sequential assembly of the medical chart, and patient information was used. Following approved permissions for use, the Prosci's change management methodology, and the ADKAR model were used to guide the change process. Quantitative data was collected over two separate six month time periods, to compare metrics before and after the change.

Results: The z-test was used to determine the significance of the changes made in the prescreening clinic. The results suggest that the changes made to the operational design in the prescreening clinic were significant in reducing day of surgery cancellations. Day of surgery cancellation rate for avoidable causes decreased from 15 cases per month to just two from December 2014 to April 2015.

Conclusions: The implementation of the project achieved the goal of decreasing day of surgery cancellations. Additional benefits from the changes implemented included reduced patient wait times in the PSC to an average of less than 15 minutes, and an increased number of patient visits per day by 55%. These changes resulted in an increase in patient satisfaction.

Data sources: Data was obtained using Epic's electronic software, which included the Cadence scheduling software. Additional software programs that were used to obtain data were the Kronos time keeping software, and Cisco phone reports. Daily schedules were developed by the manager to coordinate nursing assignments. Researched data sources used included; PubMed, Cochrane Collaboration, CINAHL, and Google Scholar.

Key words: pre-screening clinic, pre-admission testing, pre-surgical labs, pre-operative anesthesia consultations, set-up and functioning of pre-anesthesia clinic, cost effective pre-operative clinic, design of pre-operative clinic, surgery cancellation rate and the pre-operative clinic.

Introduction and Background

This project focuses on the redesign of the preoperative screening clinic (PSC) at a 410-bed acute care facility. This process change took place at a healthcare facility where surgical volume has been growing annually since 2011, with an average growth rate of 3% per year. The facility has projected business plans to add operating rooms in the next three years due to the increased growth. The ability of the organization to support continued surgical growth prior to the development of adding operating rooms required changes in operations to meet the surgical volume demand. Examination of the current PSC operations, with consideration for potential growth, was the motivation for the development of this project.

The purpose of a preoperative screening clinic is to enhance patient safety while avoiding costs due to day of surgery cancellations.[1] Previous studies showed a reduction in day of surgery cancellations ranging from 20%-88%, for medical reasons and in the number of additional tests ordered when using a preoperative screening clinic.[2] In a 2004 study, surgical cancellation rates were as high as 49% when patients required additional work-up from physician consultants.[3] A study in 2005 analyzed 6,524 elective surgical cases, and discovered that when the patient was pre-screened prior to the day of surgery, surgical cancellation rates fell nearly 51%.[4]

In the facility where the implementation of this process change took place, preoperative testing is a requirement for surgery patients. The testing is generally initiated based on a standard set of guidelines or orders that trigger a series of diagnostic tests, prior to any operative procedure. An example of a set of PSC guidelines that may be used to determine necessary diagnostic testing is depicted in Appendix A. The process at the PSC is based on the assumption that the information gained from prescreening tests, will enhance patient safety and reduce liability.[5] In a study completed in 2011, the cost for preoperative testing in the United States was estimated at $18 billion dollars annually.[6] Some of the testing that was performed not only had

its own inherent cost, but the non-selective standard testing has been shown to yield false positive results requiring additional work-up, further increasing the cost of care, and contributing to procedure cancellations.[6]

An additional benefit of the PSC is to improve the perioperative experience for the patient by coordinating surgical, anesthesia, nursing, and diagnostic testing.[7]A 1999 article highlighted the keys to promoting a cost effective preoperative evaluation. The key points discussed were: physician education to learn the cost of preoperative testing, adapt practice guidelines, utilization of clinical pathways, information sharing to avoid duplicate testing, cost effective identification, efficient medical resource management, and outcomes measurement.[7] When these key components are utilized, the clinics reduced the number of consultations, laboratory tests, and day of surgery cancellations.[7]

As evidenced in the literature, the ability to construct an efficient clinic is necessary as health care costs continue to rise. Changes in healthcare reimbursement force providers to deliver efficient, high-quality care at flat to minimally increasing rates.[8] Payment for preoperative testing is bundled under the Medicare rules for specific colon procedures, total joints, and breast procedures.[8] This practice is expected to expand to other types of surgical services which should be continually evaluated for opportunities to avoid added cost to the overall surgical experience.[8]

Inefficiencies were identified in the PSC at an acute care tertiary facility located in South Carolina, resulting in the reorganization of the department. In the facility, surgeon's orders and surgical department policies, controlled the functions and operations of the clinic. This caused the PSC to be dependent on the surgeon's office to forward necessary patient information after the case had been sent to the surgery posting office for case boarding.

The process of having the surgeon's office initiate the boarding of cases to the surgical schedule requires the surgeon's office to send necessary patient information to the surgical

boarding office and the prescreening clinic. The surgeon's office must forward all orders to the prescreening surgery clinic for diagnostic studies. This two-part process was found to be inefficient, as necessary case information from the surgeon's office was often absent causing day of surgery cancellations.

The inefficiencies in the clinic were seen in the patient satisfaction scores. The outpatient Press Ganey scores were at the 90th percentile with a consistent negative response to wait times in the PSC. Patients waited an average of forty minutes for their scheduled appointment after arriving in the clinic. This project assisted in determining if patient satisfaction would improve with decreased wait times.

The information reported here focused on the PSC for the facility represented in this project. The impetus for a PSC is to intervene prior to the day of surgery to correct, augment, or devise a plan to care for the patient on the day of surgery. The PSC was an area of concern for the facility, as inefficiencies in this area can lead to increased cost with unnecessary testing and day of surgery cancellations, as well as dissatisfaction for patients. In sum, this analysis is based on the re-design and implementation of a pre-surgical screening clinic using an all Registered Nurse (RN) staff, and a sequential assembly of medical information, with the outcome of reduced day of surgery cancellations and improved patient satisfaction.

This project seeks to answer the following research questions:

1. How does the redesign of a PSC lead to a decrease in surgical cancellations in the facility described above?
2. How can redesigning the staffing model and using anesthesia to operate the clinic inprove the efficiency of a PSC?
3. How will the redesign of a PSC impact patient satisfaction?

Review of Literature

Healthcare Costs

Rising health care costs have been a concern for several years as healthcare accounts for more than 17% of the gross domestic product in the United States (U.S.).[9] The U.S. is ranked number one among all other countries in cost per capita, and as a percentage of gross domestic product in terms of healthcare cost.[9] Healthcare spending in the U.S. has more than doubled the total gross domestic product growth rate from 1950 to 2011.[9] Surgical procedures alone amount to almost half of all costs associated with hospital stays, despite the fact that surgical admissions make up 29% of all hospital stays.[10] The literature cites several reasons for the rising cost of healthcare.

In an article from the Kaiser Health News, published in 2012, authors list some reasons that have been associated with the higher cost of healthcare. Reasons from the Kaiser Health News include new drugs, advances in technology, the current pay structure for hospitals and doctors, and increased life span.[11] Healthcare costs have skyrocketed as people expect the most up to date treatments, and third party payers pay more for what is ordered and done, than what is based on patient outcome and efficiency.[11]

Other factors impacting healthcare cost include tax incentives and the lack of adequate information available to the patient.[11] Benefits that some employers provide are payments toward healthcare premiums for employees. These benefits are not considered wages and are not subject to federal taxes. The benefit to the employee is non-taxed healthcare premiums that allow healthcare costs to the employee to remain low. When the employer pays healthcare premiums, employees who seek treatment may have a decreased incentive to consider other alternatives. Inadequate education for consumers to assist in decision-making for the appropriate type of care, and the lack of access to the most appropriate treatments are other associated factors for

increased healthcare costs.[11] An additional cost consideration includes fear of litigation, as diagnostic tests may be ordered to avoid lawsuits.[11]

Preadmission Screening Clinics

Outpatient prescreening clinics for surgical patients were first conceptualized in 1949. These clinics were initiated to reduce hospital admissions.[12] Patients were traditionally admitted the day before surgery as a method to be seen by an anesthesia provider, have diagnostic tests completed, and ensure the patient had nothing to eat or drink for several hours before surgery.[12] A cost effectiveness study, compared the cost of the outpatient anesthesia clinic to the traditional method of patient admission the day before surgery.[12] The study was conducted from 2007-2009. The data showed a decrease in surgery cancellations, by 77%, and a 62% reduction in hospital stay before surgery, reducing the overall perioperative cost by 49%.[12]

There is evidence to the advantages of having a preoperative screening clinic. The most efficient method for clinic operation and design has not been well studied. Steven Fischer's article in 1999 takes an in-depth look at setting up a preoperative screening clinic. In this article he points out 17 operational goals from Stanford University (Appendix B).[13] The main purpose of setting up the preoperative screening clinic for Stanford University was to centralize the process.[13] By centralizing processes, the perioperative team was able to achieve the goals of efficient clinical services, decreased costs, and increased patient and surgeon satisfaction.[13] The article focused on ordering of diagnostic studies, how timely test results were evaluated, and how a reduction in duplicate testing could be achieved.

Garcia, 2003, published an article on the preoperative assessment. In this publication the author notes the importance of the physical assessment in lieu of diagnostic tests.[14] The article discusses how the majority of patients scheduled for elective surgery, have a range of routine preoperative tests performed that are unnecessary.[14] In an article published on preoperative

assessment, an extensive database search was conducted over a six-year period, investigating the cost of using standardized or routine preoperative testing for elective surgical procedures. It was determined that added expenses when using routine testing, incurred a cost of over $2 million dollars annually.[14]

Preoperative Testing

A study from Dzankic, 2001, investigated predictive values of abnormal lab tests in 544 patients with a mean age of 78 years old. Researchers found with patients who were classified as ASAI-II, the prevalence of lab results that were outside the normal range was not significantly different than what had been found among the general population.[15] A systematic review published in 2012 looked at routine preoperative testing in ASA I-II patients undergoing elective minor procedures. Researchers defined routine testing as CBC, electrolytes, and pulmonary function testing. It was determined that there is strong evidence against the use of routine testing in ASAI-II patients undergoing elective surgery.[16] These previous studies concluded that the cost of routine testing in the preoperative screening clinic adds a considerable amount of cost to the surgical process.[6] At the site where the change process took place for this project, preoperative testing was duplicated between the surgeon and the anesthesiologist. Diagnostic testing was ordered based on individual anesthesia provider's preference. The need to standardize the ordering of preoperative testing was implemented as a part of this project.

Past research has focused on how much and what type of preoperative testing is optimal. This debate was ongoing prior to the development of prescreening clinics. An article posted in 1985 suggests that nearly 60% of preoperative admission testing is not indicated.[17] In 2003 the Canadian Journal of Anesthesia published more recent data after having set guidelines for preoperative testing in agreement with Canadian Anesthesiologist Society (CAS), and the hospital. The study tested for compliance with the guidelines and was conducted during the first

full year of implementation. The results compared what diagnostic tests were ordered against the established guidelines. The result of the study demonstrated unnecessary preoperative testing was commonly performed despite the guidelines.[18]

A similar study relative to preoperative testing was reported in 2010. In this study, there was a restrictive policy for routine preoperative testing that was implemented. This study was conducted on healthy ASA-I and ASA-II patients for gynecological surgery.[19] The conclusion was that the policy and recommendations to restrict preoperative testing in this population did not increase the postoperative complication rate.[19]

A study released in 2013 focused on outpatient surgery and the need for preoperative testing. This paper focused on the large 2012 Danish study that evaluated more than 57,000 ambulatory procedures. The conclusion of the study was consistent with previous publications that demonstrated excess ordering of preoperative tests, no interventions after abnormal test results, a <3% change in perioperative management, no day of surgery cancellations, and similar outcomes to those patients who did not receive any preoperative testing.[20]

Procedure Cancellations

Additional costs associated with the pre-surgical testing are surgical cancellations. According to Pollard, Zboray, and Maze in an article published in 1996, researchers found a decrease in overall surgical cost when patients were admitted the day before surgery for testing. The decrease in overall surgical cost was defined as a reduction in length of hospital stay, and the reduction in day of surgery cancellations that decreased from 26% to 6.6%. The reduction in surgery cancellations demonstrated a cost avoidance by better matching staffing and surgical case scheduling.[21]

In an article published in 2012, there is further support showing the value of the preoperative clinic. In this article the authors show a reduction in case cancellations, and

demonstrated the identification of 'new problems' during the prescreening visit necessitating additional diagnostic work prior to surgery. The results from this study revealed that all necessary information was obtained in 96% of the patients who were identified as having 'new problems' by the prescreening clinic.[22] Authors of the study identified a change in perioperative management in 27% of these patients who were found to have 'new problems'.[22] Changes continue to be made to find ways to reduce case cancellations on the day of surgery. Some organizations use guidelines set-up by the hospital and the anesthesia department, to help reduce day of surgery case cancellations. An example of these guidelines is in appendix A.

Preoperative Screening

An article in 2010 published information on when to consider diagnostic screening. The study demonstrated further evidence that routine diagnostic testing is not necessary, and the rate of false positive test results leads to injury associated with further workup.[23] The article further describes that tests should only be ordered if the result will change the anesthetic or surgical plan, or decrease the risk of the procedure.[23] While the article gives recommendations on what tests should be ordered, it is not always backed with scientific evidence. This is due to the limited studies comparing preoperative tests and patient outcomes. The authors stated that a good history and physical examination can be a substitute for diagnostic testing. This conclusion is substantiated in several of the articles related to preoperative testing.[23]

As prescreening clinics become more focused on the type and amount of diagnostic tests being ordered, more information continues to point to the need for a thorough history and physical in lieu of diagnostic testing. In 2012 the National Institute of Health published a large study of 73,596 patients from 2005-2010 who underwent elective hernia repair. The result from this study showed 46,977 patients had at least one diagnostic test performed preoperatively.[24] Of the 46,977 patients who had at least one diagnostic test done, 25,149 of them had no clear

indication for testing.[24] The result of this study shows that routine diagnostic testing before elective low risk surgical procedures is not indicated.[24]

Anesthesia Versus Surgeon Driven Clinics

The importance of preoperative consultation was examined in a study released in 2014. In the study the consultants were internists. Investigators focused on higher risk patients, ASA III and ASA IV having minor elective procedures. Researchers found no substantial evidence to support the benefit of a consultation. The differences that the article highlighted favoring the use of a preoperative screening clinic, were a shortening of the hospital stay, and a reduction in preoperative tests when using anesthesia providers as consultants.[25]

The role of anesthesia in the preoperative screening clinic has been studied since the early 1990's with the Starsnic study in 1992, the Fisher article released in1994, and the Parker study in 2000. Each of these studies were conducted in a teaching institution where anesthesiologists or anesthesia residents staffed the preoperative screening clinic.[26,27,28] The Starsnic study compared surgeon's pre-operative test ordering and anesthesiology pre-operative test ordering. The anesthesiology group ordered 28.63% fewer tests, and over the three year period reduced preoperative testing cost by $643,056.87.

The Fischer study evaluated the implementation of a preoperative evaluation clinic utilizing an anesthesiology preoperative testing guideline.[27] The result of this study was the adoption of a testing guideline that demonstrated reduced cost. The 2000 Parker study of over 60,000 patients evaluated a computer model developed by anesthesiology for preoperative testing. The computer-based model was found to be very successful at reducing unnecessary preoperative testing and cancellations. Its limitation is the surgical volume needed to make the investment in the computer model.[28] The earlier studies of success using anesthesiology

involvement in the prescreening clinic to reduce costs, were further supported in more recent literature regarding prescreening clinics and anesthesia involvement.[29,30]

A 2013 study from the National Institute of Public Health released its findings comparing consultations from different disciplines with patients prior to surgery. Results from this cohort study of 13,673 patients, indicated a large variance among the different specialties when ordering preoperative consultations.[29] The objective of the study was to determine the frequency and the determinant for ordering a preoperative consultation.[29] Researchers found that regardless of the type of surgery and comorbid patient condition, the more specialized the surgeon the greater number of consultations.[29] One of the possibilities that is mentioned in the study which may explain the additional ordering of consultations, is that surgeons have become more specialized. The increase in specialized surgeons is related to a more focused history and physical on the need for surgery, and tends to ignore the patients coexisting medical conditions.[29]

When comparing the different type of models regarding how a preoperative screening clinic could operate, differences in anesthesiology decisions for testing requirements that caused delays and cancellations on the day of surgery, was demonstrated.[30] This issue was discovered in a 2011 study from Austria. In this study a software program for preoperative evaluation was developed under the guidance of the Austrian Society of Anesthesiology, Resuscitation, and Intensive Care Medicine.[31] The software program triggered diagnostic tests to be done only under certain conditions based on abnormalities found in the medical history, or if the surgical procedure required the testing. In the study a total of 5,879 preoperative tests were completed.[31] In 65% of the cases, no diagnostic testing was required, and the physical assessment and medical interview were the only indicated assessments necessary according to the software program.[31] The study points out that there are no well accepted and recognized protocols for preoperative diagnostics.[31] The research emphasizes some possible explanations for non-adherence to the

software program such as; concerns with litigation, the influence of experience and education on the part of the ordering physician, physicians believing that they need more recent or current data, and the lack of confidence in the test results.[31]

The updated recommendations from the American Society of Anesthesiology (ASA) on preoperative testing are a practice advisory.[32] The ASA did not make standards, protocols, or guidelines to follow, but rather produced a 17 page document intended to assist with decision making in areas of patient care.[32] The rationale for the ASA publication of a practice advisory related to insufficient scientific evidence of adequately controlled studies to develop standardized protocals.[32]

A 2009 article entitled 'Nuts and Bolts of Preoperative Clinics: The View from Three Institutions', gives more detailed information about set-up and operations of a prescreening clinic. In this article, the researchers discussed reporting relationships for the prescreening clinic falling under the department of anesthesia.[33] The design uses an anesthesiologist to staff the clinic. Some reasons for having a prescreening clinic operated by an anesthesia provider include; someone assuming responsibility for test results, being better able to drive standardization through a department that impacts all surgical patients, better coordinated care between providers, ease in meeting compliance with regulatory bodies for documentation with patient assessments, and ordering appropriate diagnostic studies such as ECG's and radiology studies.[33] These interventions are examples of opportunities that can be developed to improve efficiencies when structuring the prescreening clinic under the management of the anesthesia department. What was not demonstrated in the literature was the cost of operations by having an anesthesiologist staff the clinic.

Patient Satisfaction

The result of a patient satisfaction study in 2004 demonstrated support for the preoperative screening clinic. The study was conducted over a three month time period collecting 857 responses on the patient's experience in the preoperative screening clinic.[34] The study reported the patient response from questions regarding way finding, ease of testing, information given about the procedure, patient education, professionalism, interpersonal skills, and the purpose of the visit.[34] The results of the survey showed that the patient satisfaction level was highest when grading the involvement of the anesthesia provider and nurse practitioner.[34] The largest patient dissatisfaction shown in the study was the patient time spent in the clinic averaging two hours and eighteen minutes.[34]

There are varied designs and layouts described in the literature for the operations of a prescreening clinic. A study released in 2011 on the preoperative consultations by anesthesiologists, compared different program models using anesthesia attending physicians, anesthesia residents, and nurse practitioners in the preoperative screening clinic for an anesthesia evaluation. The use of a nurse practitioner in the preoperative screening clinic, functioning under the supervision of an anesthesiologist, appeared to be the most efficient with no change in patient outcome or increased day of surgery cancellations.[30] The biggest gain for the patient, as cited in a 2011 anesthesiology journal was the decrease in patient wait time in the clinic from 92 minutes to 42 minutes.[30]

Restructuring of a PSC

When restructuring a prescreening clinic, interventions used to address inefficiencies begin by defining the goals of the clinic, followed by understanding how to meet those objectives.[33] The best approach when defining the goals of the clinic is based on the patient population, the types of procedures performed, and the volume of cases being managed.[33]

Standardization helps meet many goals and can occur at many levels from performance of assessments and testing, organization of the patient chart, system checks throughout the process to make sure nothing is missed, and team-to-team communication.[33]

An article published in 2012, and delivered at the Hawaii International Conference on System Sciences, provided detailed information on the improvement of the preoperative process. The author writes about process design, benchmarking framework, and the preoperative patient evaluation. The conclusion demonstrated the cost effectiveness of having a prescreening clinic by avoiding surgery delays or cancellations, minimizing redundancy, and improved coding for reimbursement.[35] The article substantiates four specific key elements to establishing a preoperative evaluation clinic. These four key elements include standardizing the assessment, careful triage of the patient to avoid unnecessary assessment or tests, preoperative assessment and management guidelines for the different surgical procedures, and the utilization of an electronic health record .[35]

The literature addresses the importance of an outpatient-prescreening clinic and efficient operational design functioning under the management of anesthesia.[20,26,27,28,30,33,35] The literature reviewed investigated three different models for department design under the management of the anesthesia department. The three operational staffing designs in the literature are; staffing with an anesthesiologist, anesthesia residents, or nurse practitioners in the prescreening clinic. This literature offers information about standardizing practices in the preoperative screening clinic. [20,26,27,28,30,33,35]

The need to address cost in the pre-surgical screening clinic begins by understanding that each clinic is unique to the population that it serves. The literature review demonstrated that to obtain efficiency in the PSC, goals of the clinic should be defined, and processes should be standardized to help meet those goals. Current research has not shown a prescreening department

design and operational set-up that may yield comparable results of reduced day of surgery cancellation using a sequential assembly of medical information, with an all registered nurse model, that were applied to accomplish the process change for this project.

Purpose

This project focuses on the re-design and implementation of a pre-surgical screening clinic using an all RN staff and a sequential assembly of medical information with the outcome of reduced day of surgery cancellations.

Methodology

An extensive literature review was performed to obtain evidence-based literature to support the need for a process change, the redesign of the PSC in a 410-bed facility in South Carolina. The Prosci ® change management methodology, ADKAR was applied for this process. The ADKAR model was chosen as a guide for a change management strategy, based on research of best practices to implement change for the previously described facility.[36] The ADKAR model is defined as Awareness, Desire, Knowledge, Ability, and Reinforcement®. See Appendix C for a diagram of the Prosci change model.

Quantitative data was collected prior to the changes from July 2014 to November 2014. This data was compared to information collected after the changes had been instituted, and during the time period of December 2014 to April 2014. Data was collected from reports that were developed in the electronic health record, as well as reports from the employee time keeping system and electronic phone logs. IRB submission was completed through the University of Michigan-Flint. The final disposition from the IRB committee viewed the project as a quality assurance and quality improvement activity, therefore IRB oversight was not required.

Application of the ADKAR Model

The ADKAR model describes an awareness that a change needs to occur. It was recognized that a higher than acceptable number of surgery cancellations occurred at the facility previously described. At the institution being studied, the rate of surgical cancellations averaged 15 per month. Beginning with phase one of the ADKAR model, the process was initiated by assembling the key stakeholders (Appendix D). According to the ADKAR model, this is a critical step in the process to gain an understanding and buy-in from those who are directly affected by the process change. The initial meeting with the management team and staff was to discuss current workflows in the PSC, see appendix E. Continued discussions led to future state workflows, (Appendix F), and a plan was developed to transition from the current state.

The planning and engagement of management and staff is considered very important in understanding the details of the operations of the PSC prior to enacting change. Gaining knowledge and understanding at this step is critical to advancing the process, as each organization has it's unique set of processes and procedures. In the studied organization, engagement and understanding were missing from the day-to-day operation.

The PSC staff possessed an awareness of the objectives for the PSC. Lacking was the knowledge of how to make changes to improve the operations of the clinic. Identifying the tasks necessary to implement change in the PSC with the staff, led to changes in workflow and task management. Job duties were categorized as follows:

a. Phone screening
b. Patient interviews
c. Chart assembly
d. Chart assessment and final chart evaluation by anesthesia

Prior to the reorganization of the PSC, the manager responsible for assigning nursing staff to the various roles within the department, collected metrics of patient wait times, number of interview calls made per day, the number of surgery cancellations as reported from pre-op on day of surgery, and the number of days from the time the patient was scheduled for surgery that the patient was screened for surgery. The data was used to justify the changes implemented in the clinic. A significant goal and outcome measurement for this change project was to reduce day of surgery cancellations.

Implementation

Prescreening Department Operational Design Prior to the Changes

Prior to redesigning the prescreening clinic at Lexington Medical Center, the prescreening department was under the management of the operating room manager. The number of pre-screening phone calls averaged 50 per day. The department of surgery developed the pre-screening phone call questionnaire. The purpose for the phone call was to communicate a time and date for surgery, as well as inform the patient regarding day of surgery expectations. The initial pre-screening calls were conducted by non-licensed ancillary staff, and had only two qualifying questions relative to co-morbidities. The two questions consisted of the patient's history of hypertension (HTN) and diabetes. If the patient had a history of diabetes or HTN a second, follow up call was required.

A second call to the patient was placed by a staff nurse based on the presence of the two co-morbidities. When the nurse made phone contact with the patient, further medical questions were asked. Additional screening questions were typically based on the nurse's experience and lacked structure and consistency. The nurse's inquires lacked detailed patient histories that may have anesthetic implications , and trigger the need for further testing prior to the day of surgery. The phone screen had no prompts for the nurse to ask about the patient's current prescription

medication. Patients arrived on the day of surgery without knowledge of appropriate medication usage prior to surgery.

The average number of scheduled visits for patients who were seen in the prescreening clinic was 25 patients per day. The average number of unscheduled patient visits per day was 10. The prescreening clinic averaged 35 patients per day that were seen on the day of surgery for labs, signing the consent, and obtaining the patient's height and weight. The clinic hours were from 0530 to 1730 Monday through Friday. The clinic hours did not accommodate many daytime working individuals. The average number of days prior to the day of surgery that patients were seen for their pre-surgical screening visit was one to two days. This time frame did not allow for additional clearances to be obtained, medication changes, or interpretation of diagnostic test results prior to the day of surgery to make recommendations. The average wait time for patients to see a nurse for their pre-screening visit after their arrival was 40 minutes.

A flow diagram of the operational model for the prescreening clinic prior to the process and design changes is depicted in Appendix E. The diagram illustrates areas that required change to adapt to increasing patient visits. One of the areas that required change was that patients would no longer come through the pre-screening clinic on the morning of surgery. Another area requiring change, was the rework that occurs when attempting to clear a patient for surgery. Prior to the design change, medical clearances and diagnostic test results were evaluated on the morning of surgery. As the hospital has grown and began servicing higher acuity patients, the process of evaluation on the morning of surgery led to a number of surgical delays and cancellations.

The day of surgery cancellation rate triggered the need for changes to be made in the prescreening clinic. One of the goals of the clinic following the changes was to be able to see patients, and process diagnostic tests at least five days prior to a scheduled procedure. The

purpose of obtaining diagnostic studies and evaluating test results several days prior to surgery is to reduce delays and surgical cancellations. In order to obtain this goal, the clinic was restructured.

The operating rooms at Lexington Medical Center facilitate over 15,000 surgical procedures per year in 23 operating rooms. This number has increased over the past three years by 3%-5% per year with new plans being developed to add six operating rooms due to capacity constraints. The prescreening clinic is a non-revenue generating department. Therefore, the prescreening clinic was tasked with developing a plan to absorb the volume while containing cost.

Cancelled procedures occurring on the day of surgery may result in significant cost to an organization. In 2012 researchers from Tulane University examined financial data and operating room metrics of 4876 cases and calculated the average cost per case of a cancelled surgery at $4,550 per cancelled case.[37] Case cancellations occur for many reasons and cause a great deal of frustration for the physician, hospital administration, and staff. The reasons for cancelling a surgical case on the day of surgery were identified and documented by the preoperative nurse. The type of case cancellations that were attributed to the current operations of the preoperative screening clinic were defined as avoidable issues.

Avoidable cancellations were those issues that should have been recognized and acted on accordingly prior to the day of surgery. The most frequently encountered reasons attributed to avoidable case cancellations, were a lack of medical or cardiac clearances, and abnormal diagnostic findings on the day of surgery that would dictate needed treatment prior to surgery. The average avoidable cancellation rate was 15 cases per month. Literature suggests, case cancellations have been shown to increase health care cost, reduce potential revenue, impact patient safety, and negatively impact the patient's experience.

This organization is a non-teaching facility and employs both the anesthesiologist and the certified registered nurse anesthetist. Having an anesthesiologist or certified registered nurse anesthetist staff the clinic was considered when analyzing operational cost. This was compared against the staffing designs used for prescreening clinics in the literature. The staffing designs used in the literature review required additional costs to the department, either by adding manpower or software programs. Adding software programs meant the possibility of licensing costs, as well as having to associate new software with the current electronic health record. This researcher chose a staffing design that is composed of all registered nurses and under the leadership of anesthesia to operate the pre-screening clinic based on available research evidence.

Prescreening Department Design Changes

The flow chart in Appendix F was developed to depict the restructured program design of the prescreening clinic. The process changes illustrated in Appendix F demonstrate the efficiency of an improved workflow. Optimizing patients prior to surgery reduces day of surgery delays and cancellations for problems that could have been resolved during the prescreening process. This improved workflow brings the patient directly to pre-op on the day of surgery following registration, and allows the pre-op nurse to begin to process the patient earlier. The workflow change reduced diagnostic testing and duplicate work from other anesthesia providers, by using a standardized set of anesthesia guidelines that are similar to those seen in Appendix A. Following the Prosci model shown in Appendix C, a flow diagram was designed as part of the preparation for the change (Appendix F). An overview of clinic operations using a sequential assembly of the patient's medical information is noted below.

Operational Design Changes

The first consideration in restructuring the operations of the PSC was to reorganize staffing structure. The nursing manager for the department of surgery had previously managed

the prescreening clinic. The first organizational change for the PSC was to have the prescreening clinic managed by the director of anesthesia. This was accomplished based on the literature review, which indicates that the success of a PSC is optimal when managed by anesthesia personnel. The implementation of a PSC managed by anesthesia personnel, resulted in a change in the type and frequency of diagnostic tests, with a reduction in duplicate testing. This change was accomplished by the standardization of prescreening testing, and changing the focus of the clinic to the identification of a patient's comorbid conditions. The strategic change in management better aligned with the functions that the pre-screening clinic performed under the guidance of the anesthesia provider.

The process was initiated with the posting of the surgical procedure. Simultaneous posting of the procedure from the surgeon's office adds the patient to a call list in the prescreening clinic. Once the patient is on the call list a phone screen to the patient is then placed. In the department where this change was implemented, a registered nurse was utilized to make phone calls, avoiding duplicate calls from non-medical personnel.

The CRNAs and anesthesiologists enhanced the PSC nurse's knowledge by presenting information regarding the redesign of the unit. Staff education was performed during the nurse's staff meetings using a lecture style. Nursing staff meetings were held in a classroom setting, selected to capture the greatest number of nurses at one time. The information that was presented to the RNs, was meant to assist their understanding of the new work flow, and the type of preoperative evaluation information anesthesia providers require when completing patient assessments.

An example of the anesthesia pre-op evaluation form shown in Appendix G, was used to help guide the nurses during the interview process with patients. The new form was developed to shift the focus of interview questions to illicit pertinent information for the provision of safe

anesthesia care. The staff meeting presentations were delivered in a lecture style format focusing on triaging patients based on co-morbid conditions to determine the necessity for a visit to the clinic for further evaluation. The questions were developed from information gained through the literature review, which focused on comorbid conditions.[33]

During a phone interview, a registered nurse asks the patient a number of health related questions. The questions relate to patient morbidity from an anesthesia perspective. The following conditions were investigated during the prescreening process based on current literature; shortness of breath when walking up a flight or two of stairs, recent or past chest pain, high blood pressure, diabetes, heart problems such as skipped beats, heart attack, use of continuous positive airway pressure, (CPAP) or other similar device at bedtime, presence of snoring, fatigue or sleepiness during the daytime, liver or kidney disease, use of assistive devices, numbness and tingling of extremities, and a list of all the medications including over the counter and herbal medicines.[33] Positive responses to these conditions resulted in the patient being directed to the clinic for further follow-up.

If the patient needed to come in for a pre-surgical screening visit, a more in depth physical assessment was completed. Typically, these same patients required a set of diagnostic studies. The diagnostic tests were done based on an order set from the anesthesiologist. The most common tests ordered were a basic metabolic panel and ECG. Once the test results were received they were placed in the patient's chart.

The chart was assembled and previewed by a registered nurse looking for any missing information such as additional orders and clearances from consulting physicians. The registered nurse interviewed the diagnostic information looking for abnormal tests results or medical clearances that were highlighted for further review. The chart was taken to the anesthesiologist for further review.

The anesthesiologist reviewed the information with the prescreening nurse. This final review process was used to best evaluate the anesthetic risks, and decide if the patient is optimized for surgery. The redesign has resulted in an improved ability to complete a chart review with attached consults, diagnostic test results, and if needed, obtaining additional diagnostic results days before surgery.

Staffing Changes:

The staff positions were changed from a previous staff mix of clerks and nurses to an all registered nurse (RN) staff. The previous role of the clerk in the prescreening department was to answer phones, make patient appointments, place calls to the patient to validate demographic information, notify the patient of surgery date and time, and begin to develop the patient chart. Developing the patient chart was initiated by placing the boarding sheet, paperwork from the physician office, and a patient demographic sheet in the patient's chart. Utilizing the electronic health record, patient demographics and physician notes were placed electronically.

The role of the clerks was restricted with regard to patient interaction. Clerks do not have post-secondary medical training at this institution. The lack of medical training prevented the clerks from associating medical information with the patient's health status or surgical procedure. This limitation restricted the clerk's role when communicating with patients. The lack of medical training coupled with the adoption of the electronic health record was the basis for the decision to change the staffing mix.

Balancing the Cost of Change:

As a part of managing change, the PSC design change was delivered at a staff meeting to capture the greatest number of nurses at one time in an uninterrupted venue. Staff education was completed while the daily work was being performed. The education of the staff focused on the understanding and use of the anesthesia preoperative evaluation form that focused on the

patient's medical and surgical history. During the first two months of training, the current number of patients that were seen on a daily basis remained the same. The associated costs were training, staff salaries, and clinic operating hours.

The department operation was designed to use a sequential assembly of medical information in four distinct work areas within the prescreening clinic. The four areas are phone screening, processing orders, patient visit and assessment, and completing a chart analysis and investigation. Each staff RN was trained to all four areas. The orientation to each area was set-up in two-week blocks. Orientation to the new process was coordinated with the director of anesthesia and the manager of the PSC.

Training for the phone screening, and the patient visit and assessment appointment, was focused on the patient's co-morbid condition. The nurse was given a couple of tools to help them coordinate their work. Examples of these tools are seen in appendix A and G. Appendix A is a diagnostic testing guideline that was designed by anesthesia providers to help the nurse during the assessment process. Appendix G was the paper form used by anesthesia when assessing the patient on the day of surgery prior to going live with electronic health record. The actual templates that were populated by the nurse during the phone screening, and the patient visit assessment, were from the electronic health record EPIC software program.

The nurse responsible for processing orders received orders from the physician office by fax or through the electronic system. Once received, the nurse placed orders into the system to be initiated when the patient came to the hospital. The last phase of the work area was completing the chart analysis and assembly. In this phase the nurse was responsible to locate lab results and consults. Diagnostic testing results that were 'out of range' for what would be considered normal based on the set criteria from the lab, were noted and the chart was brought to the anesthesiologist for interpretation.

The anesthesiologist decides if the patient requires further testing or if they are 'cleared' for surgery from an anesthesia perspective. As part of the process to standardize anesthesia practice, once the anesthesiologist cleared the patient for surgery a different anesthesiologist assuming care of the patient on the day of surgery with no acute changes, has options. One option is to continue with the anesthetic plan of care. A second option is to consult with the anesthesiologist who cleared the patient for surgery. If additional testing is desired the anesthesiologist is required to document the medical necessity, and consult with the department chairperson of anesthesiology.

Training for an individual nurse took approximately eight weeks to complete. As they completed the training, the staff assignments were rotated to cover each area, every one to two weeks. When the nurses are assigned to their specific area they had specific duties to complete. The work relationship with the RNs in the clinic appeared to improve as each area was directly impacted by the performance of the RN in the other areas within the prescreening clinic.

A one-time cost for training occurred from information services. The cost for training using one resource and a total of eight hours at a rate of $33 per hour was approximately $264.00. The training from the information services representative was provided during staff meetings in a classroom setting, as well as during the regular hours of clinic operation. Over the two-month period, the manager exceeded a 40-hour workweek by working 50-55 hours per week. Although the manager's rate of pay was not affected as this person is in a salaried position, it is noteworthy to discuss as a part of the cost of implementing the program. There was one reduction of a full-time equivalent (FTE) with the transfer of the two clerk FTEs, that were reclassified as a single RN FTE during the implementation.

An evaluation of the cost difference was performed to compare the additional salary for an RN versus salaries for two clerks. The RN annual earnings were $56,672 while the earnings

for the two clerks combined was $52,624. The annual cost difference of $4048.00 was accepted as a variance within the budgeted margin for salaries. The two full-time clerks were replaced and absorbed within the organization. As a result, the staff members did not suffer a negative financial impact. The cost of adding an anesthesia provider to staff the clinic was evaluated, and thought to be cost prohibitive and did not align with the budgetary goals of the department.

The clinic hours of operation were reduced by 6%, from 60 hours per week to 56.5 hours per week. The change in clinic operating times was adjusted to better accommodate patient needs. The change in hours of operation was adjusted from 0530-1730 Monday-Friday to 0730-1800 Monday-Friday and 0900-1300 on Saturday. Saturday was used for phone screening purposes only as the associated ancillary services such as lab, X-ray, and cardiology were not available. Adding Saturday phone screening hours allowed the staff to make more first time phone call contacts with patients, thus increasing efficiency by avoiding repeat phone calls.

The addition of the electronic health record allowed the nursing staff in the prescreening department to access patient information. The electronic accessibility of patient information reduced the need for paper printing, provided easy access to patient demographic and diagnostic information, and the ability to electronically communicate with surgeon offices to obtain additional information. The utilization of an all registered nurse staff allowed for a single phone contact with the patient to obtain specific medical information. Patient responses to phone questions determined the necessity for a clinic visit for evaluation by an RN. When the patient presented for a prescreening visit, diagnostic tests were completed. If the patient requires lab work, it is scheduled as early in the prescreening process as possible, but no more than 30 days prior to surgery, with the exception of coagulation studies and pregnancy testing.

Data was collected regarding the number of phone call assessments placed by the RNs to the patients by time of day and length of the call. The average time to complete the phone

assessment was 16 minutes. Completed phone call assessments were compared to the number of patients scheduled for surgery and needing to be called, and the date the surgical case was scheduled. Data was collected from the date the patient was evaluated for surgery by anesthesia, and compared to the date for the scheduled procedure. The information was used to track the number of days that were between the time the case was scheduled for surgery, and the date the patient was assessed.

Patient visit times at the PSC were tracked from the time the patient entered the clinic with an electronic time stamp on the record. A second time stamp occurred when the patient was taken back to the interview room, and a final time stamp was applied when the interview was completed. The data collection and analysis allowed tracking for the length of time the patient spent waiting for their interview, and the length of time it took to complete the interview at the clinic. The average length of time the interview took was 24 minutes. Th[illegible]ta collection for PSC calls, patient visits to the PSC, and patient evaluation by anesthesia w[illegible]racked prior to the implementation from July 2014 thru November 2014. The program was im[illegible]lemented in December 2014, and data was continually tracked for the following five months.

Patient satisfaction scores as measured by Press Ganey were evaluated. An increase from the 90th percentile to the 94th percentile was seen when comparing department operations prior to and after the change. Following the implementation, the benefits of reduced day of surgery cancellations, increased time frame for seeing patients prior to the day of surgery, and reduced patient wait times in the clinic were seen immediately.

Results

A two-sample z-test was used to compare the means of two independent populations to determine the significance of the changes made in the prescreening clinic to reduce case cancellations in over 6,000 cases. The statistical analysis using a two-sample z-test calculated a p

value of <0.00001. These results suggest that the changes made to the operational design in the prescreening clinic were significant in reducing day of surgery cancellations. Day of surgery cancellation rate for avoidable causes decreased from 15 cases per month to just two during the last five months of data collection (Figure 1).

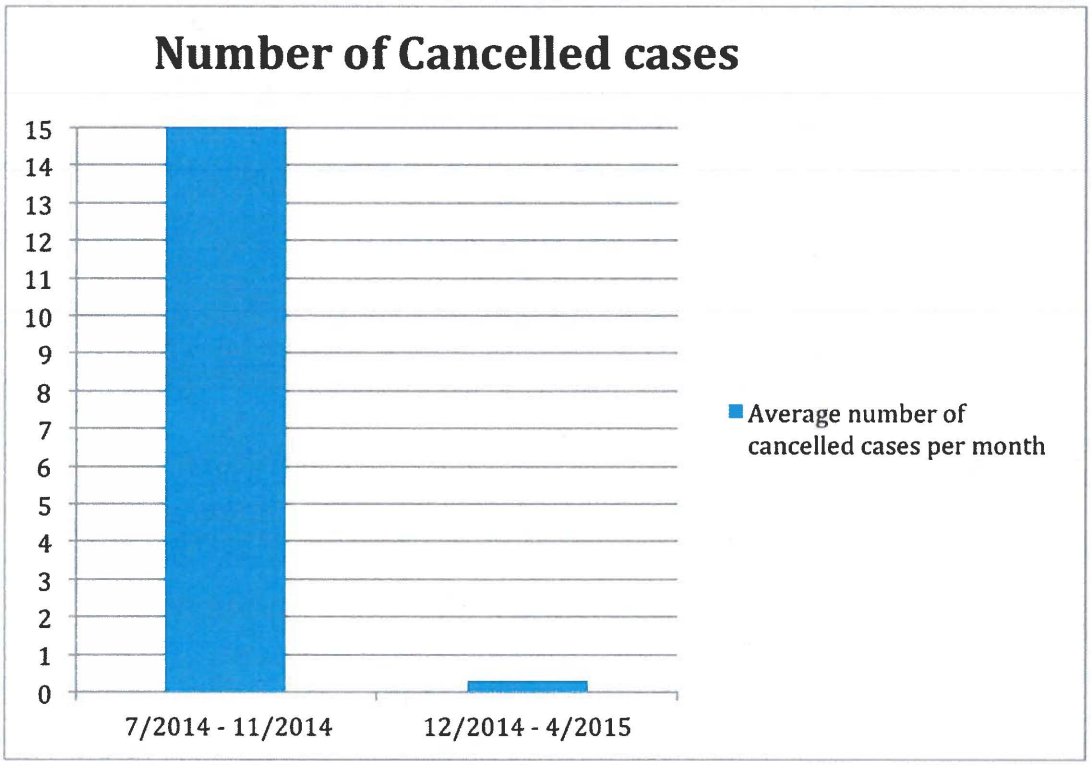


Figure 1. Cancelled Cases measured before and after the changes.

Figures two and three show the outcomes of using a schedule to make patient appointments, schedule patient visits, track and manage department productivity. Figure two shows the decrease in patient wait times from 40 minutes to 15 minutes following the changes. The patients wait times in the clinic decreased by 37%.

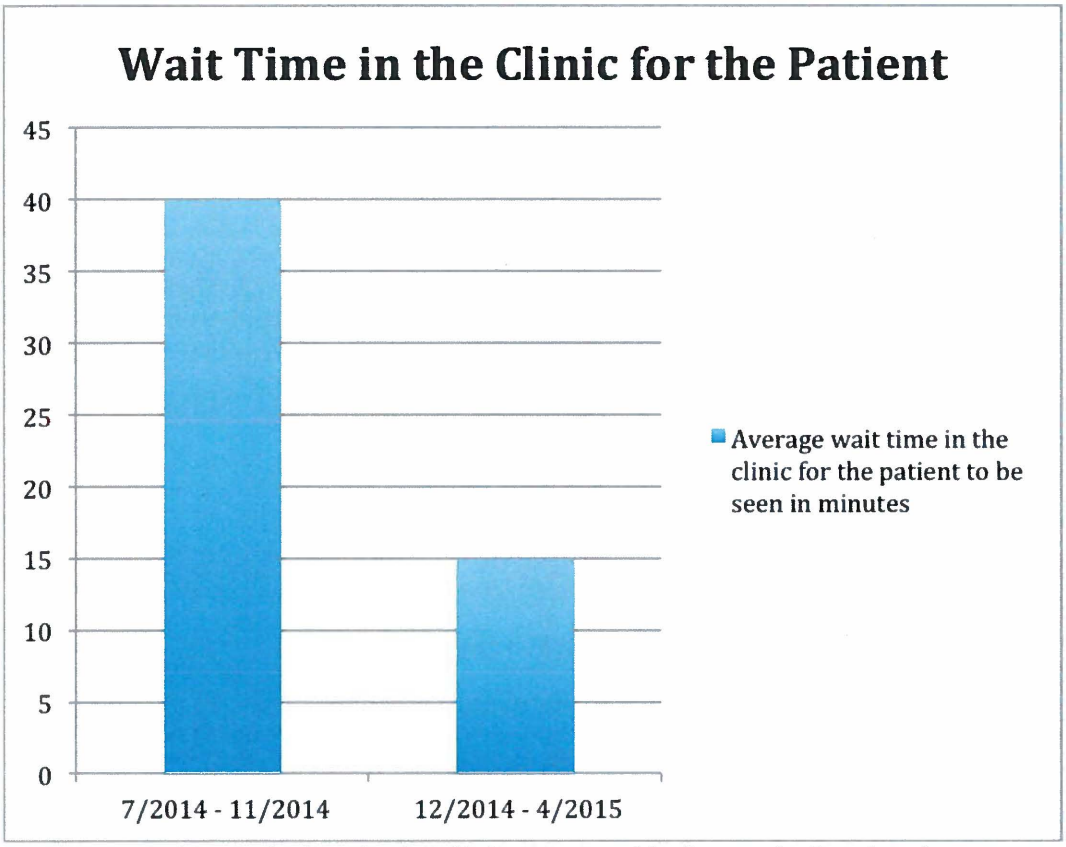


Figure 2. Patient wait time in the clinic measured before and after the changes.

Figure three shows the impact of scheduling patient visits and managing staff productivity. This increased the ability to see more patients as scheduled patient visits were increased by 55%.

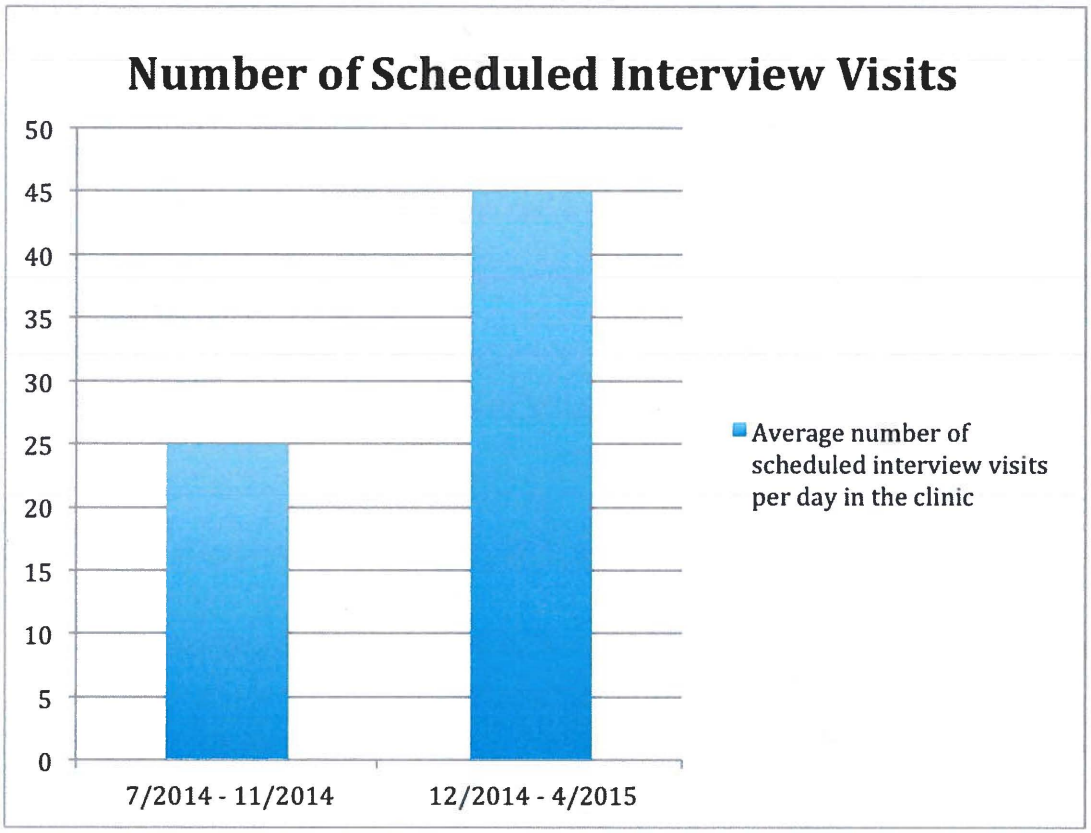


Figure 3. The number of scheduled patient interview visits in the PSC before and after the changes.

The re-design of the PSC at this organization provided for a streamlined workflow process resulting in a higher level of productivity. Department policies and procedures were updated to reflect the changes in workflow. The increase in phone calls was a significant factor in improving patient contact to phone screen and schedule patient visits. The screening calls to patients per day increased by 82%. The increased number of calls placed to patients had a direct impact on increasing the length of time for the average number of days between the time the patient was scheduled for surgery, and when the patient would be contacted by the prescreening

staff. The time frame for when the patient was seen in the clinic relative to the date of surgery increased from 1.5 days to 8 days. The ability to see patients earlier in the prescreening process allowed for necessary screening and diagnostics to optimize the patient for surgery. The changes significantly reduced day of surgery cancellations from an average of fifteen per month to only having two avoidable surgical cancellations from December 2014 to April 2015.

Discussion

Prescreening clinics were developed to avoid the cost associated with pre-surgical hospital admissions, and to optimize a patient for surgery. Changes in healthcare reimbursement over the past several decades have seen a shift from admitting patients prior to surgery for pre-surgical testing, to performing outpatient diagnostic testing. Outpatient prescreening clinics have recently been included in a single payment reimbursement for surgical services that is also weighted by patient outcomes.[8] Prescreening clinics are viewed as a part of the perioperative experience much like pre-op, recovery, and sterile processing. The changes in reimbursement that reduce the amount of money that hospitals receive, continue to drive the goals of improving efficiency and implementing cost reduction methods, without impacting quality patient care.

Anesthesia may play an active role in the PSC. Anesthesia providers are responsible for writing preoperative orders, determining necessary diagnostic testing, and assessing the need for consults prior to the patient coming to surgery. This information is used to optimize the patient prior to surgery. The concept of optimizing the patient prior to surgery, as verified by the literature, has the potential to reduce patient mortality.[26,28]

The PSC changes demonstrated improvement in operational efficiency and patient satisfaction as supported by the outcomes. The changes in clinic operations resulted in the clinic scheduling 55% more patients per day, a 37% reduction in patient wait times at the clinic, an increase in patient satisfaction scores to the 94th percentile, and a significant reduction of

avoidable day of surgery cancellations by 93%. The value of reducing day of surgery cancellations is further supported by the 2012 Tulane study showing a cost per cancelled case at $4,550.[37] At the facility where this project took place there was an average of 15 cancelled cases per month. The cost of 15 cancelled cases per month could cost the organization $68,250 per month based on the Tulane study. Following the changes in the PSC, the cancellation rate fell to 0.4 cancelled cases per month.

Changes that took place in the redesign of the PSC that resulted in positive outcomes, are a limitation when attempting to identify a single element of change that was responsible for the project's success. One of the strengths to the successful implementation of the project was the participation of the nursing staff. Nursing staff participation and knowledge of required anesthesia information was gained through department meetings that were led by an anesthesia provider. This change shifted the priority from the type of surgery the patient was having to the patient's health condition. Additional strengths that led to the success of the project were tracking patient information and outcomes with the implementation of an electronic health record. The electronic health record was a key resource during the development of the redesigned PSC. The key findings discovered in the literature review, and implemented as a part of this change process, were the change in the reporting structure of the prescreening clinic, and standardizing practice among anesthesia providers.

Conclusion

This project took place at a non-profit, non-teaching healthcare organization located in the suburbs of South Carolina that performed over 15,000 cases annually. The project was designed using standardized anesthesia guidelines and a staff of all RNs in the PSC. The redesign of the PSC at this facility changed the staffing pattern, and developed a process using a sequential assembly of patient's medical information several days in advance of the patient's

scheduled surgery. The new staffing design using all RNs incorporated the patient screening call, the patient visit, and the assembly of medical information that was analyzed by the anesthesia provider. RNs completed the screening calls, made clinic appointments, and were able to assess the patient during clinic visits. The RN completed the assembly of patient information looking for abnormal studies. The anesthesia provider utilized the information to best optimize the patient prior to their scheduled day of surgery.

This project focused on reducing the number of avoidable cancellations on the day of surgery. Anesthesia has a vested interest in reducing day of surgery cancellations and improving patient outcomes as providers are paid based on the type and complexity of anesthesia performed. The desire for anesthesia to reduce the number of case cancellations is demonstrated by their active collaboration with the surgeon in assessing the patient prior to surgery.

Additional information collected during this project, that may have been useful is the institution's actual savings by reducing the number of case cancellations. However, specific institutional financial information can be difficult to obtain based on organizational policy and availability of information. Recommendations for future project work include compiling detailed financial information to associate the cost per cancelled case. Additional related studies include investigating surgeons, anesthesia providers, and nursing staff responses regarding how cancelled cases impact their practice.

The scope of the project to reduce day of surgery cancellations encompassed a department redesign. The redesign of the department resulted in multiple changes. Future research to understand what change might have had the greatest impact on reducing day of surgery cancellations may be beneficial.

This project demonstrated changes made to the design and operations of a PSC, which resulted in a significant impact on reducing day of surgery cancellations. This is evident based on

the project results of greater than a 98% reduction in day of surgery cancellations. Additional changes to the department led to reduced patient wait times in the clinic, an increase in patients scheduled in the clinic per day, and an increase in patient satisfaction scores.

No additional staff were required to operate the clinic. The utilization of anesthesia personnel to manage clinic operations, assisted in the optimization of patients prior to surgical procedures. While these changes were significant, the statistical analysis does not differentiate which single change may have been more impactful. The results suggest that the collective changes made to the prescreening clinic were beneficial in achieving significant outcomes, and assisted in answering the research questions posed in this project.

Appendix A **Anesthesia guidelines for diagnostic testing**

Conditions	Drug level/Misc	CBC/Plt	PT/PTT/INR	HCG	BMP	CMP	EKG	CXR
Anemia (within 1 year) (Excessive Blood loss)		X						
Arrhythmia / Pacemakers	K+						X	
Bleeding disorder, History of		X	X			X		
Chemotherapy/ Radiation (within past 6 mo.) (CXR if Radiation/Thoracic ever)		X			X		X	
Chest Pain (Cardiac), Coronary Artery Disease		X	X		X		X	
COPD (Severe) (home O2 or recent change in symptoms)	ABG				X			
CHF (recent admission of exacerbation within 90 days)		X						X
Coumadin (draw on AM of procedure)			X					
Diabetes					X			
Diuretics					X			
Drugs: Digoxin/ Dilantin/ Lithium	X				X			
Dyspnea on exertion (Acute) (* H&H only /No CBC)		H&H			X		X	
Females: menstruation-50, exclude for prior hysterectomy				X				

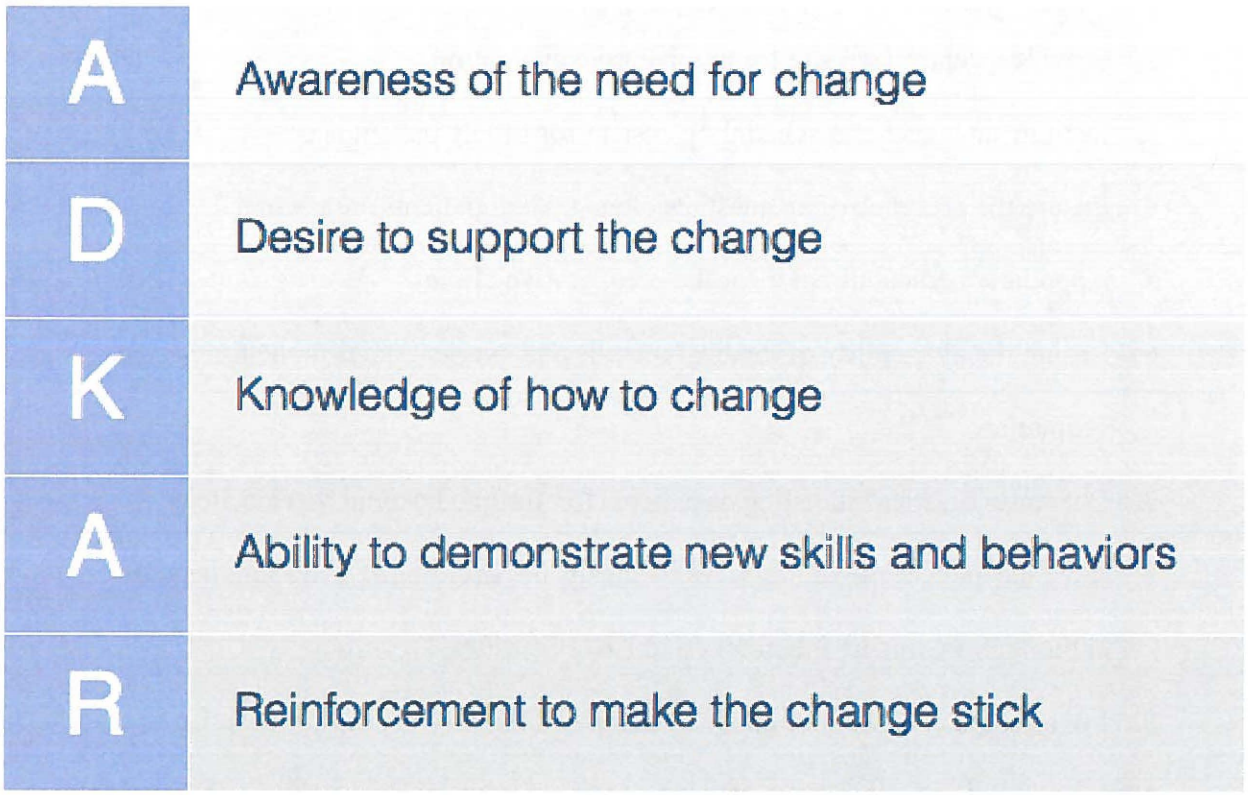
Conditions	Drug level/Misc	CBC/Plt	PT/PTT/INR	HCG	BMP	CMP	EKG	CXR
High Surgical Acuity: vascular, gastric bypass, thoracic procedures, pericardial window, Major Bowel or Abdominal Cases.		X	X			X	X	
Liver disease (severe/ cirrhosis/ heavy ETOH) (plus LFT)		X	X			X		
Total hip, knee or shoulder procedure (* H&H only / No CBC)		H&H	X			X		
Spinal with Instrumentation (* H&H only / No CBC)		H&H	X		X			
Hypertension							X	
Renal Disease (CRI, CRF) (Dialysis patients need BMP on Day of Surgery)		X			X		X	
Respiratory Disease w/ worsening symptoms during PAT process		X						X
Stroke / TIA / Syncope (Circle One)							X	

Appendix B

Stanford University's operational goals for development and implementation of a preoperative evaluation clinic:

1. Improve the client's perception of the perioperative evaluation experience
2. Provide a centralized site for preoperative evaluation
3. Institute an anesthesia scheduling system for timely patient access and flow
4. Ensure the presence of an anesthesiologist when patients are present
5. Appoint a medical director for the preoperative clinic
6. Ensure the availability of medical records and surgical notes at the time of preoperative evaluation
7. Decrease logistical shuffling of patients to multiple hospital service areas
8. Integrate and coordinate services by means of admitting/registration, insurance authorization, on-site laboratory and EKG facilities
9. Improve the education of patients families about the surgical procedure and anesthesia
10. Ensure and coordinate cost effective ordering of preoperative diagnostic testing
11. Provide a medical consultation service for medically complex patients
12. Decrease cancellations and day of surgery delays
13. Enlist the skills of the nurse to assist in the preoperative evaluation and patient/family teaching
14. To develop protocols and clinical pathways
15. Perform quality assurance reviews
16. Maximize efficiency in operating room function by coordinating preoperative information in one area
17. Enhance patient and surgeon satisfaction.

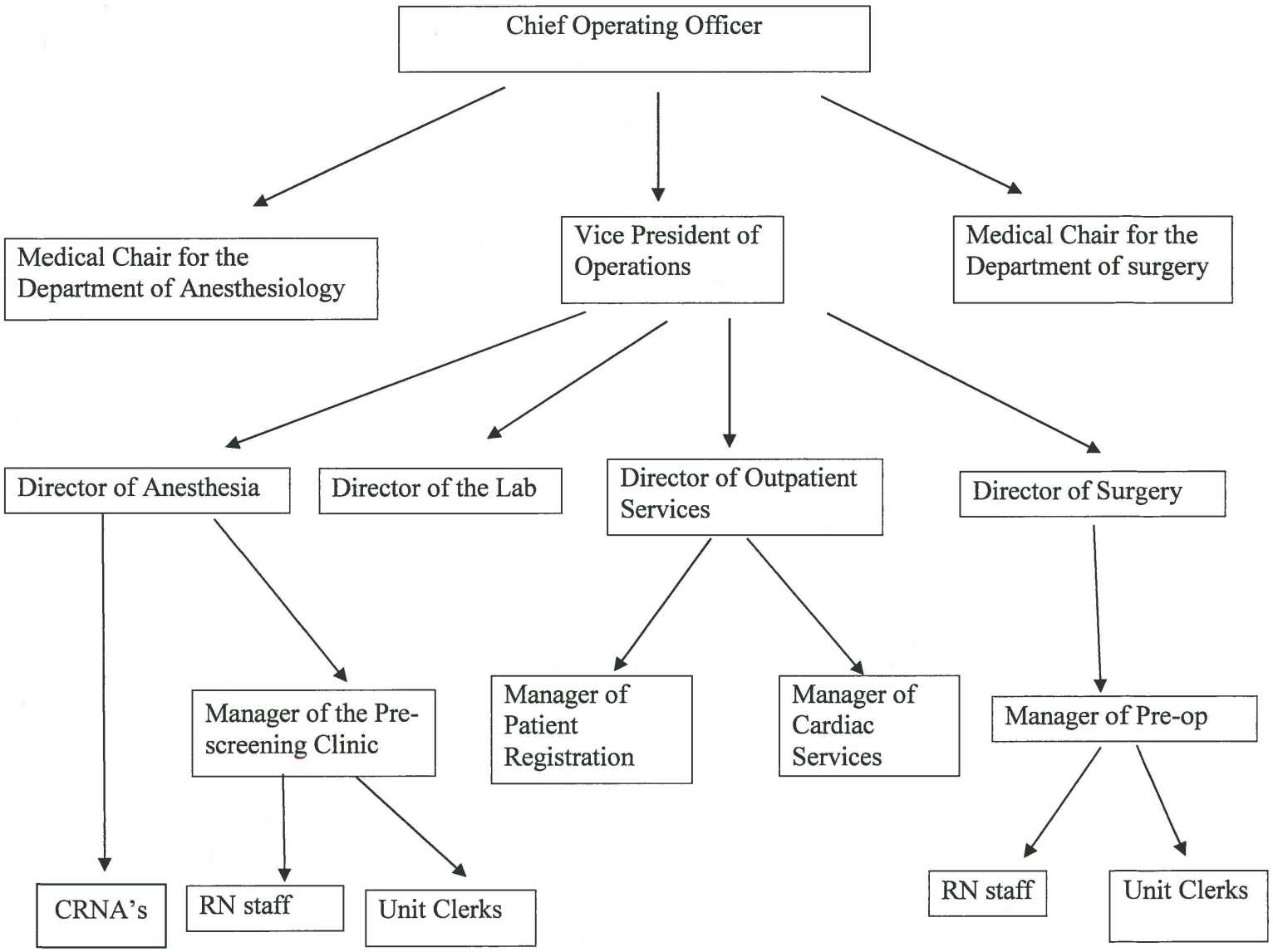
Appendix C **Prosci Change Management Process**[1]



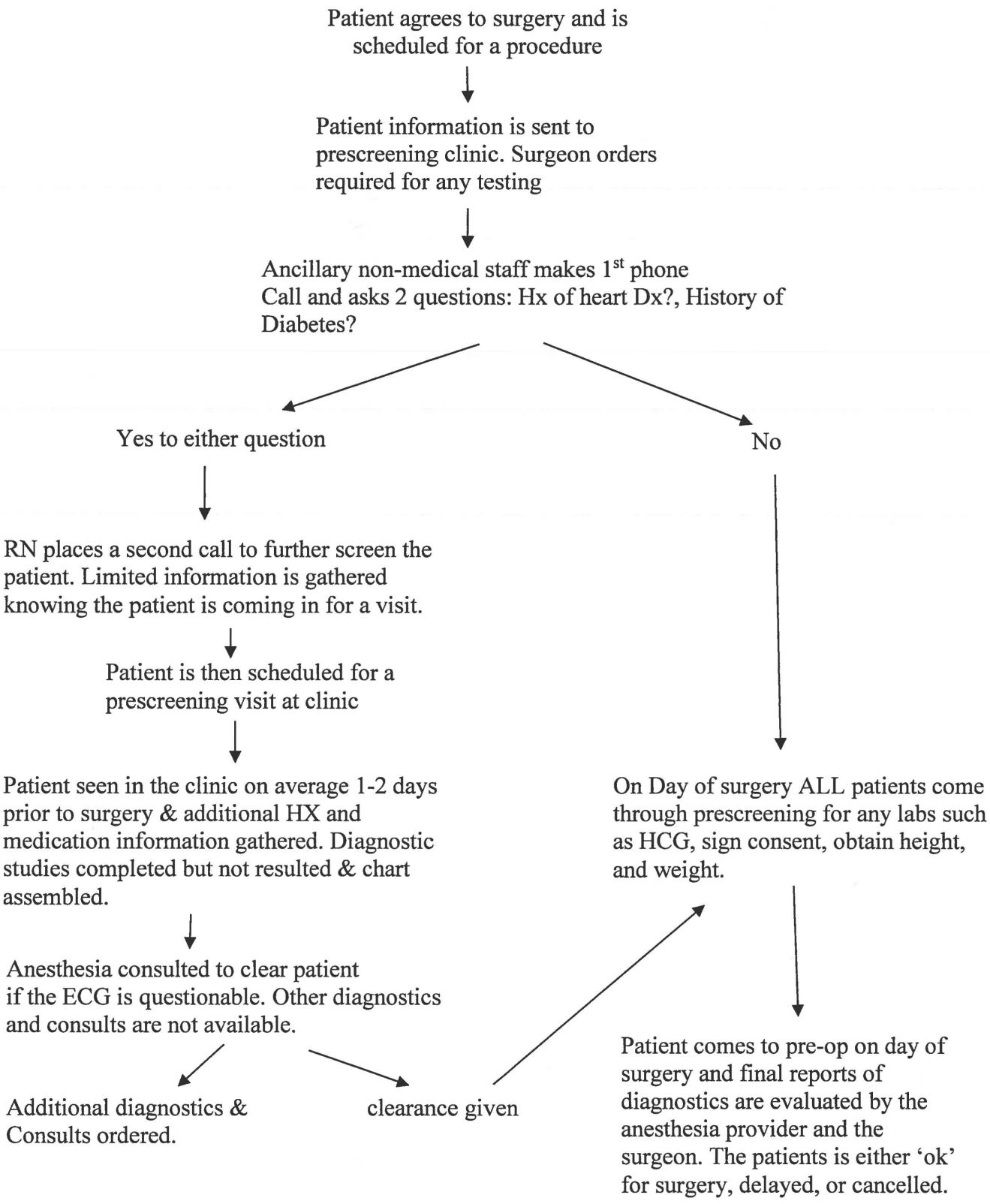
[1] © Prosci, Inc. All rights reserved

Appendix D

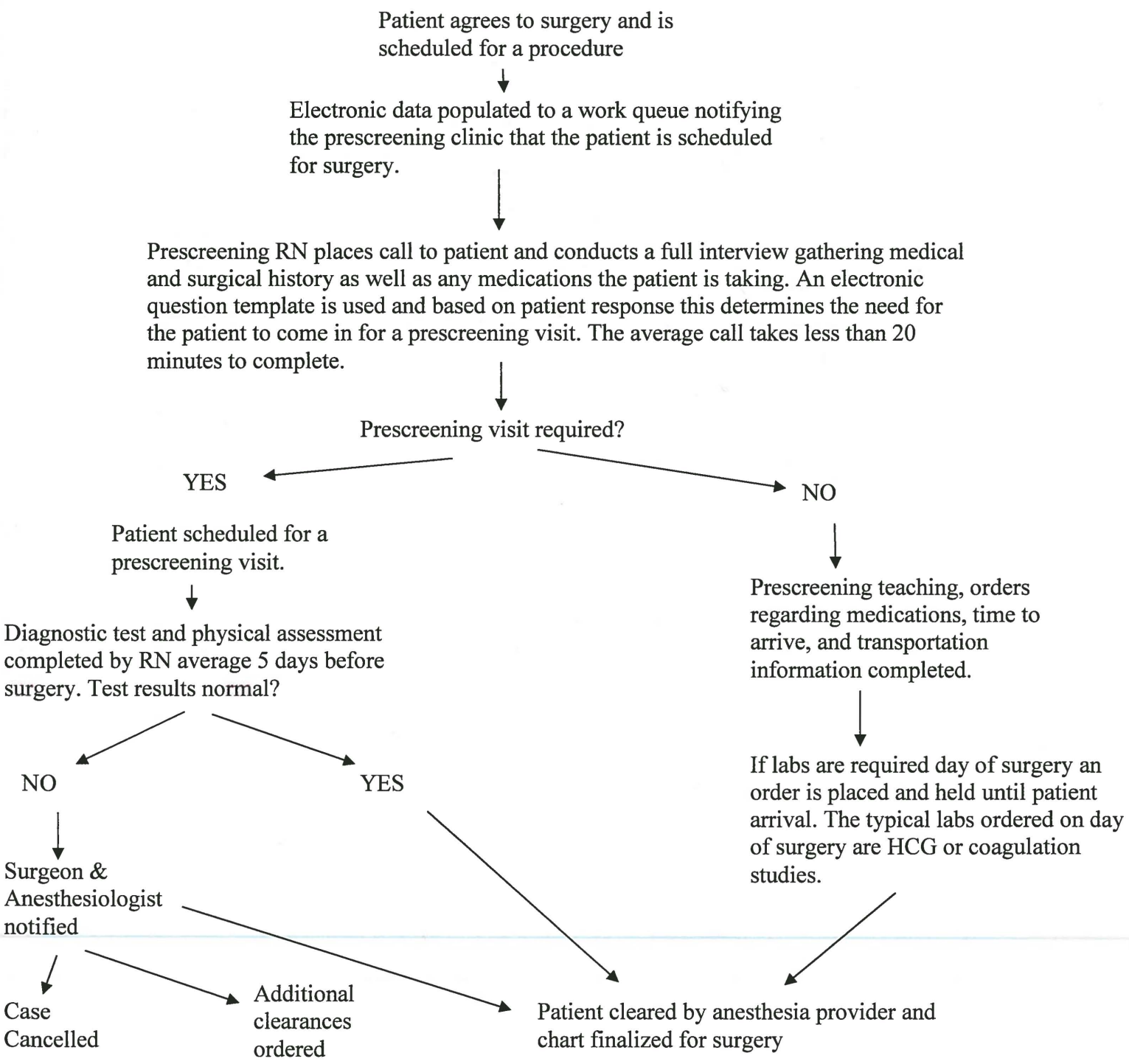
Organizational Chart of Stake Holders



Appendix E **Prescreening process flow prior to the change**



Appendix F **Prescreening process flow after the change**



Appendix G

Pre-Anesthesia Evaluation

PROCEDURE : NPO:

CARDIOVASCULAR: ☐Negative Hx ☐ Poor condition
☐CAD ☐Pacemaker/Defib ☐Palpitations ☐DVT
☐CHF ☐MVP ☐Angina ☐ Filter
☐Prior MI x ____ ☐Murmur ☐Pedal Edema ☐PND
☐Angioplasty ☐Rheum. Heart Dis. ☐Orthopnea
☐Stents x ____ ☐ Atrial Fib ☐Periph. Vas
☐Hypertension ☐CABG x___ ☐Carotid Artery stenosis

☐Pacer ☐AICD ☐ Ablation

Carotid duplex:

EKG: ☐**Echo:** ☐**Heart Cath:**

☐**Stress test:** **E.F.**___% ☐No Ischemia

RESPIRATORY: ☐Negative Hx ☐Home oxygen
☐Recent URI ☐Emphysema ☐Productive Cough
☐Asthma ☐COPD ☐ Dyspnea on Exertion
☐Bronchitis ☐Intubated on Vent ☐SOB at rest
☐Pneumonia ☐Obstructive Sleep Apnea ☐CPAP/BiPAP
☐Cigarettes_____packs/day x _____yrs ☐Quit_____

PFT'S: ☐Anticipate Post-op Ventilation

CXR:

ENDOCRINE: ☐Negative Hx ☐Hyperlipidemia
DM: ☐Type I ☐Type II ☐Diet control ☐Oral Med ☐Insulin
☐HypoThyroid ☐HyperThyroid ☐Obesity ☐Morbid obesity
☐Recent Steroid Use ☐Need Steroid Coverage ☐Gout

GASTROINTESTINAL: ☐Negative Hx ☐**Full Stomach**
☐Hiatal Hernia ☐Acute Abdomen ☐Liver Dysfunction
☐Reflux ☐Bowel Obs. ☐Hepatitis history
☐Peptic Ulcer ☐ETOH ☐Jaundice
☐Current N/ V

RENAL: ☐Negative Hx ☐Stress Urinary Incontinence
☐Hx stone ☐UTI ☐BPH ☐Prostate CA
☐Chronic renal dis. ☐ESRD ☐Hemo/Peritioneal dialysis

MUSCULOSKELETAL: ☐Negative Hx
☐Arthritis/DJD ☐Muscle weakness ☐Neuromuscular disease
☐Back Pain ☐Back Surgery ☐Leg Pain R / L / both
☐Fracture/dislocation ☐Fibromyalgia ☐Neck Surgery

HEMATOLOGICAL: ☐Negative Hx
☐Anemia ☐Hemophilia
☐Prolong bleeding
☐Sickle Cell Disease
☐Jehovah's Witness / refuses blood

Infectuos Disease:
☐HIV ☐MRSA
☐Hepatitis ☐TB

NEURO: ☐Negative Hx
☐Seizure hx ☐TIA ☐CVA
☐Paralysis/Sensory Deficit/Wkness L/R
☐Syncope ☐Parkinson
☐Peripheral Neuropathy ☐CP ☐MS

Psych: ☐Negative Hx
☐Anxiety ☐Depression
☐Manic ☐Bipolar
☐Panic Attacks
☐ADHD ☐Dementia
☐Schizophrenia
☐Narcolepsy

_____year old ☐M ☐F | HT: | WT:

☐No previous anesthesia
☐Prior general anesthesia with no complications
☐Prior regional anesthesia with no complications
☐ History of Postoperative Nausea & Vomiting or motion sickness
☐Previous anesthesia complications:
☐History of malignant hyperthermia
☐Negative Family History

HGB	HCT	PLTS	PT/PTT / INR	Units T&C / T&S

FBS	Glucose	Na+	K+	Cl / HC03	BUN	Creat:	HCG: ☐Neg ☐N/A	Other:

ALLERGIES: ☐**NKDA** ☐Latex ☐Betadine ☐IVP/Contrast DYE
☐ Adhesives
☐Codeine
☐PCN
☐Cephalosporins
☐Sulfa

Current Meds			

ASA 1 2 3 4 5 6 E

Airway Teeth Evaluation: ☐Anterior Larynx
Dentures:☐upper ☐lower Caps/Bridge:☐upper ☐lower
☐Limited Oral Opening ☐Limited Neck ROM
Condition: ☐good ☐fair ☐poor ☐missing teeth
Airway Class: ☐I ☐II ☐III ☐IV ☐Missing Teeth

Estimated intubation difficulty:
☐Easy ☐Moderate ☐Difficult

Anesthetic Plan: ☐General ☐MAC ☐TIVA ☐LMA/Mask
☐Cricoid Pressure/RSI ☐Oral ET Tube ☐Nasal ET Tube

☐Glidescope available **Block:** ☐Spinal ☐Epidural as primary anesthetic

☐Epidural for POPM ☐ TAP ☐PVB ☐ Adductor ☐ Popliteal

☐Interscalene ☐Supraclavicular ☐Axillary ☐Femoral Nerve ☐For POPM
☐ Other: ☐ **Ultrasound guided**

☐Arterial Line ☐Central Line ☐ PAC ☐ TEE

PONV Prophylaxis: ☐TIVA ☐5HT3 Antagonist ☐Decadron ☐Inapsine
☐Scop Patch

ANESTHETIC PLAN, ALTERNATIVES, SPECIAL PROCEDURES, RISKS OF ANESTHESIA, AND POTENTIAL COMPLICATIONS WERE DISCUSSED. PATIENT, SURROGATE, AND/ OR PARENT(S) STATE UNDERSTANDING AND ACCEPTANCE OF ANESTHESIA PLAN AS DISCUSSED AND DESIRE TO PROCEED.

SIGNATURE DATE TIME

Patient information/sticker

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