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Reducing Operating Room Turnover Times

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Clinical Leadership Theme

Clinical microsystems represents building blocks of a larger health organization where front line professionals deliver safe and high quality patient-centered care in order to achieve positive outcomes and continue to strive for better performance. A problem or issue within a microsystem can cause a rippling effect with the other interlinked systems and can lead to chaos or unfavorable outcomes. In order for a microsystem to be effective, it must have a strong leader that can guide the team members toward a common goal in a systematic manner. As explained by Nelson, Batalden & Godfrey (2007), "Health system redesign can succeed only with leaders who take action to transform these small clinical units in order to optimize performance to meet and exceed patient needs and expectations and to perfect the linkage between the units" (p. 30). A masters-prepared generalist with a strong clinical background such as a Clinical Nurse Leader (CNL) is best fit to lead a microsystem in obtaining its goals through assessment, implementation and testing evidence-based delivery of care.

The focus of this project is to enhance patient and staff satisfaction thorough the quality improvement method of reducing operating room (OR) turnover times (TOT) at an ambulatory surgery center (ASC). As a Team Leader and Manager of Care, it is necessary to perform a microsystem assessment, data gathering and analyzing and facilitating staff communication in order to provide high-quality care and better outcomes. The following describes the global theme of this project:

We aim to improve the OR turnover times in between surgeries within the four ORs at the ASC. The process begins when the patient is wheeled out of the OR and ends when the next scheduled

patient enters another OR. By working on the process, we expect to: (1) identify tasks that are carried out during turnover that may cause lag time, (2) increase patient and surgeon satisfaction by starting surgeries on time, (3) improve staff satisfaction by appointing tasks to appropriate team members and equal division of labor, (4) improve cost-effectiveness by appropriately scheduling OR staff and minimizing unnecessary overtime (OT) hours and (5) implement any necessary rearrangement of materials or equipment within the OR or hallway that would facilitate a faster turnover. It is important to work on this now so that we can improve OR efficiency, be cost-effective, and increase staff and patient satisfaction.

Statement of the Problem

The ORs are one of the most costly and labor-intense areas of a healthcare environment whether located within an acute care setting or in an ambulatory surgery center. In a study performed by Kodali, Kim, Bleday, Flanagan, & Urman (2014), they've concluded that OR TOT is a common performance metric utilized to study OR efficiency due to its uncomplicated measurement and is subject to less patient-related variability. TOT at the surgery center varies by procedures and surgeons and if there is a TOT delay, it can result in a negative financial impact and also affect patient and surgeon satisfaction. A lengthy TOT can cause delays in surgery start time with the subsequent surgeries, resulting in unsatisfied patients/surgeons and costly OT salary for the staff (Appendix A).

Providing safe, high-quality care that leads to high patient satisfaction is our primary goal. By improving our turnover time, it also lessens the time that patients have to wait in the pre-operative area, minimizing the anxiety that some patients encounter prior to surgery. According to Harders, Malangoni, Weight, & Sidhu (2006), delays in delivery of care can cause negative financial impact on an organization as well as dissatisfaction among patients and health

care workers.

Project Overview

Located in Burlingame, California, this ASC has four ORs and is open from Monday through Friday with the exceptions of certain holidays. Ranging from pediatrics to the elderly, the patient population comprises of professional and recreational athletes, individuals with work-related musculoskeletal injuries and those suffering from arthritis that may cause a limitation to their movement. The primary goal of the healthcare team is to get patients back to their optimal level in a short period of time. The organization strongly encourages using the mindset of a "team approach" in which other surgeons may review and consult with each other in order to provide ultimate specialized care and active patient participation (Soar Medical, 2016).

There are twelve orthopedic surgeons with different specialties that utilize the surgery center on designated days. The clinical microsystems are subdivided into the pre-operative (pre-op), OR, and post-anesthesia care unit (PACU). A clinical nurse manager manages the clinical areas and personnel that are assigned to these units and are a mix of the following: six full-time Registered Nurses (RNs), two full-time medical assistants (MAs), four full-time OR technicians (ORTs), two full-time OR Staff Support and three full-time Instrument Technicians. During the high volume months, per diem RNs and ORTs are staffed on an as-needed basis. The non-clinical front office staff consists of three administrative personnel and a billing/insurance coordinator. Lastly, the Materials Department is staffed with a manager and support that is responsible for ordering and processing materials, medications and instruments required for scheduled cases. The focus of this project is primarily on the OR microsystem but it is also of importance to keep in mind that the other microsystems should also be considered since what occurs in pre-op can have a rippling effect in the OR, affecting TOT as well as an extended stay

in PACU (Appendix B).

It is my intent to analyze TOT data from the last quarter of the 2016 fiscal year and identify areas of improvement and implement changes in collaboration with the perioperative team and staff in order to be cost-effective and improve OR efficiency (Appendix C). The ultimate goal is to reduce TOT so that the wait time for both patients and surgeons are minimized and surgeries start according to its scheduled time. Each wasted minute has a monetary value attached to it, so minimizing TOT can only lead to cost effectiveness, OR efficiency and productivity. A staff in-service will be held to review OR workflow process during turnovers, staff schedule and the assigning of specific tasks to team members for a smoother turnover. The next step would be to assess the placement of specific equipment and/or materials needed during turnovers and make any necessary adjustments for better accessibility. The specific aim statement for this project is as follows: "We aim to reduce operating room (OR) turnover times (TOT) at our ambulatory surgery center by 5-10%, improve patient and surgeon satisfaction by reducing the pre-surgery waiting times, improve OR efficiency and staff satisfaction through well-defined designated tasks and promote cost-effectiveness through proper staff scheduling and reducing of overtime (OT) hours by July, 2017." The specific aim parallels the goals that are listed on my global aim, which is to improve TOT resulting in patient and staff satisfaction while being cost-effective.

Rationale

Utilizing the 5Ps framework to assess my microsystem, I have discovered that my microsystem need derives from the Processes part of the framework. According to Jerico, Perroca, & Penha (2011), the importance of measuring performance is vital to the success of improving work processes that leads to the reduction of operational costs and promote patient

satisfaction. Long TOT not only causes an effect in terms of delayed start times on surgeries to follow but it can also cause a psychological effect on the patient due to long waiting time in the preoperative area. As an ASC, operating room activities is what drives the income producing side of the organization but is also the most labor-intense. Utilizing TOT as a performance metric is not only easily attainable but it also less prone to patient variability and has been a factor in which the intraoperative team and management at the ambulatory surgery center has been trying to improve. The idea of this project came to fruition upon the urging of one of the surgeons' suggestions to perform a study focusing on OR efficiency. To support this, Cima et al. (2011) explained, "Maximizing OR efficiency is essential to maintaining an economically viable institution" (p. 83). The cost analysis for the project will mainly consist of labor hours utilized for staff in-service and training in order to implement process improvement changes (Appendix D).

Methodology

The objective of this project is to assess the microsystem, identify any gaps in the TOT process and implement any changes in the workflow that will result in improved patient, staff and surgeon satisfaction while being cost effective. In order to facilitate this project, Lewin's Change Management Theory will be implemented. Wojciechowski, Pearsall, Murphy, & French (2016) explained that Lewin's three-step model is commonly used by nurses to implement change at bedside for quality improvement since it forces individuals to defy any restraining forces and propel toward the direction of change (Appendix E).

Once the implementation of the project is initiated, as a CNL and Team Leader, I will continuously work closely with the team and serve as a source of information if ever there is a problem or issue that arises. Ensuring that team members are also in compliance of the tasks

assigned will be a focus to prevent any deviations from obtaining the aim of the project. Concurrently during the implementation phase, test cycles will be performed utilizing Plan-Do-Study-Act (PDSA). According to Sokovik, Pavletik, & Pipan (2010), Deming's Plan, Do, Study and Act (PDSA) cycle is utilized to continuously search for better methods of improvement and is also effective in managing implementation of new methods. The three fundamental questions focuses on exactly on the following: (1) Aim – what are we trying to accomplish?, (2) Measures – How will we know that a change is an improvement?, (3) Changes – What changes can we make that will result in an improvement? (Nelson, Batalden, & Godfrey, 2007, p. 273). The steps taken in answering these questions will guide us in planning appropriately before implementing any changes. As previously mentioned, our aim is to decrease the TOT in the OR in order to increase OR efficiency and patient/staff satisfaction and be cost-effective. In order to evaluate the rate of success of this project, TOT after the implementation will be compared to the previous quarters prior to the changes. Changes that needs to be implemented for this project will be the following: (1) Evaluation of the scheduled cases by the OR manager prior to finalizing the schedule in order to ensure proper flow of cases, (2) Appointing specific job tasks to the OR team during turnover for equal division of labor and preventing any unnecessary delays and (3) Reconfiguring the placement of equipment and materials within the ORs or OR hallway for easier access that would facilitate a smoother turnover.

Lastly, the PDSA cycle will allow us to test any new changes through planning, implementing, analyzing results and acting on what necessary changes will need to be made. This cycle in continually utilized until the expected outcome is achieved. At the end of the second quarter, I will extract TOT data utilizing the HST data system for comparison in TOT from the initial data that was used. I predict that the TOT will be improved after the

implementation of process changes, meeting the goal of 5-10% improvement with positive results.

Data Source / Literature Review

At an ASC, the ORs are the income-generating areas of the facility but are also the most costly resources. According to Gottschalk et al. (2016), OR TOT is often the focus of attention and improvement because it allows the surgeons to maximize their caseload, which helps OR productivity. The literature compiled for this project supports the concept that improving OR TOT is cost-effective while improving OR efficiency and patient satisfaction. The following literature review demonstrates the different strategies that support this theory.

In a study by Bhatt, Carlson, & Deckers (2014), the authors' strategy was to initially identify any current problems that are affecting the TOT management and implement a redesigned process that would improve average TOT and reduce process variability. This study did not limit their redesign focus on the OR alone but rather, utilized a systems-based approach. Three major interventions that were carried out were: developed an OR readiness criteria to be utilized consistently, implemented parallel processing to assist patient and OR readiness and improve communication amongst the perioperative units. Post-implementation of the redesigned process indicated a significant reduction in both the mean and standard TOT based on 237 subjects. Mean TOT was reduced by 0:20:48 min, a 46.9% reduction and standard deviation was reduced by 0:10:32 min, a 64.2% reduction.

A study performed by Gottschalk et al. (2016) focused on the contributing factors that may affect hand surgeon OR TOT. Performed by five attending hand surgeons, a total of 685 hand cases were performed over a 15-month period. The authors theorized that some of the factors that influenced TOT were the following: the surgeon's presence in the room, case type,

case scheduled time and the patient's American Society of Anesthesiologists (ASA) class. Results indicated that TOT was shorter in cases where the surgeon remained in the OR during turnover (27.5 minutes vs. 30.4 minutes). Patients categorized under ASA Class 1 and Class 2 had significantly shorter TOT by 8.2 minutes and 9.9 minutes respectively than Class 3 patients. The scheduling of cases also had an impact on TOT and it was noted that TOT were longer when it took place between the hours of 12:00 noon and 1:00 pm. Surgical cases were performed in both an ASC and in an orthopedic specialty hospital (OSH) and results indicated that the cases performed in an ASC had shorter TOT (27.9 minutes vs. 36.4 minutes). This study presented different factors that can affect TOT but one limitation that needs to be noted is that the study is limited to orthopedic hand surgery.

Kodali et al. (2014) decided to focus on the organizational challenges that can present during operational changes to workflow. The study was performed at Brigham and Women's Hospital in Boston, a large academic medical center that has 793 beds with 43 functioning ORs. Two previous attempts to implement the process improvement of improving TOT has failed in the past and this prompted the authors to focus on what challenges and barriers are encountered and how to overcome them. Some of the barriers that were encountered were: staff resistance to change, failing to sustain new changes, geographical location of ORs and the lack of support to mobilize change from the physicians. With the exception of the geographical issue, the main theme noted was that OR leaders' presence within the units especially during the critical implementation phase was important since it conveyed monitoring and support to the staff. Despite of the barriers, the study resulted with an average decrease in TOT of 4-5 min in a 47-minute turnover, reflecting an 8-10% improvement.

A study performed by Reznick, Niazov, Holizna, Keebler, & Siperstein (2016) focused

on the utilization of a dedicated OR team to help improve OR TOT time. The OR team consisted of an OR nurse circulator and OR scrub tech that was oriented to the specific type of surgeries that the endocrine surgeon performed. This pilot program consisted of 25 cases performed with the new dedicated team. They theorized that using a dedicated team will improve OR efficiency due to the familiarity of the procedures and less distraction. Overall, the program was successful in not only decreasing overall OR time from 125.51 minutes to 112.1 but it also decreased the OR TOT from 29.0 minutes to 26.4 minutes, a 9.0% improvement.

Performing a PICO search for the above mentioned articles proved to be quite challenging when determining what particular combination of words to utilize in order to receive the type of articles that would be relevant to my project. After several attempts, the PICO search that provided me results were: P - surgical patients, I – surgery in hospital, C – surgery in ambulatory surgery center, O – operating room turnover time.

Timeline

The projected timeline for this project encompasses a total of seven months for the startup in three phases. The initial phase includes the preliminary meeting with stakeholders involved, data gathering and project planning and training. This takes place between the months of December 2016 – March 2017. The second phase is the implementation of the project with concurrent testing utilizing the Model for Improvement with Plan-Do-Study-Act (PDSA) cycles. According to Nelson et al. (2007), the Model for Improvement serves as a structure to test ideas with anticipated improvements. The final phase is to re-assess and evaluate the initial results of the project for the quarter that it was implemented with the stakeholders (Appendix F).

The largest barrier faced for this project was during the implementation phase. The combination of the unexpected acquisition of the ASC by a larger institution and preparation for

a state survey occurred during the month of March, which caused the implementation to be delayed until further notice by management.

Expected Results

With the implementation of a structured workflow, I expect to meet my specific aim of improving the OR TOT by 5-10%. Once the in-service and training of staff has been fulfilled and everyone is aware of the goal (unfreezing step of Lewin's theory), I anticipate the OR teams to hold each other responsible for their assigned tasks and roles and will work cohesively as a team in order to provide positive patient outcomes. Initially, the OR teams will need some coaching, guidance and reminder of our objectives and will also need to do some PDSA cycle checks to see what is or isn't effective. Feedback from the staff will also be solicited during the implementation process in case any necessary adjustments need to be made. The clarification and assigning of turnover tasks to the appropriate team member will also assist in making a smoother turnover transition as well as prevent staff burnout. With the newly reconfigured OR materials to be within reach during turnovers, I would expect time wasted in retrieving any necessary materials will be improved. Once the newly adopted process is well on its way and each team member is comfortable with their roles and tasks, this will lead to a more efficient flow of surgery traffic, fulfilling staff, surgeon and patient satisfaction.

Nursing Relevance

In a recent analysis performed by Padeginas et al. (2017), the authors indicated that there's an increasing focus on value-based care over surgical volume especially after the introduction of the Affordable Care Act and that healthcare institutions and surgeons are motivated to find methods of increasing OR efficiency and volume without jeopardizing patient safety. By evaluating SOAR's OR TOT and finding solutions in improving the TOT time, it

demonstrates quality improvement that promotes improved OR efficiency and cost-effectiveness while providing safe, high-quality patient care. As a Team Leader, this fulfills the CNL competency of utilizing performance measures to assess and improve the delivery of evidence-based practices in order to deliver high quality of care (American Association of Colleges of Nursing, 2013).

Summary

The idea for this project came to fruition when I discussed the need for a process improvement project at the ASC occurred with my preceptor and the stakeholders involved. In order to continuously provide safe, high quality patient care while meeting patient and staff satisfaction and cost effectiveness, it was determined that decreasing the OR TOT would be a good fit for this assignment.

Both the global and specific aim for this project has beneficial effects on not only the organization but on the patient population that it serves. From a financial standpoint, the aim of reducing OR TOT would be beneficial for the organization since it will reduce any unnecessary operational costs related to delayed surgeries such as staff overtime pay. As a patient, decreasing TOT would eliminate prolonged waiting time in both the waiting room and pre-op area, which can cause unnecessary stress and anxiety. Staff satisfaction will also be met by appointing specific tasks to the OR team members during turnover to prevent confusion and burnout. Lastly, with shorter TOT, surgeons are able to start surgical cases as scheduled without any delays, which increases surgeon satisfaction.

The methods in which data would be captured were carried out as planned by utilizing the HST system in retrieving clinical times for surgeries performed. Once data was gathered, cases were evaluated for any outliers that needed to be eliminated due to its affect on average

turnover times. Cases that were considered outliers were the following: surgeries that were rescheduled and/or scheduled to a different OR affecting the OR sequence due to a same-day cancellation, cases where extra help such as surgical fellows were present (since not all surgeons utilize fellows) and atypical prolonged cases that are not performed routinely. Since the HST reporting system only captured clinical data such as OR in, surgical start and end times, the actual turnover time had to be manually calculated by capturing the time difference in which one case left an OR and the next scheduled case entered another OR. This was the time consuming part of the project since each case had to be evaluated for any outlier characteristics. Once the weekly average TOT for the fourth quarter of 2016 was evaluated and properly calculated, it was then transferred into a visually appealing graph for an easier interpretation (Appendix C).

Due to an unforeseen acquisition of the ASC by a larger company, the implementation phase of the plan has been abruptly delayed. In addition to the recent acquisition, the ASC is also preparing for an upcoming state survey so the organization's focus has primarily been shifted to these changes prior to implementing the project. I predict that once the survey has been performed and the approval to continue with the implementation phase has been granted, the project will maintain sustainability through the strong support of the stakeholders as well as its benefits. The stakeholders include the clinical nurse manager, ASC administrator and OR surgical team who are all in support of this quality improvement for an improved surgical workflow and patient/staff satisfaction. In order for this process improvement to maintain sustainability, it is imperative that champion member is appointed, preferably a member of the surgical team who is in close contact of the OR staff during a turnover, to serve as a resource.

Conclusion

Providing safe, high quality patient care with active patient participation resulting in positive patient outcome is our organization's goal. This proposed project is aimed to improve OR efficiency by decreasing OR TOT resulting in both staff and patient satisfaction as well as cost effectiveness for the organization.

Conducting the research and data gathering for this quality improvement project made me realize that even making slight changes such as appropriate scheduling of surgeries, reconfiguration of OR materials and equipment and appointing specific tasks to team members can greatly influence the length of waiting period for both patients and surgeons as well as saving thousands of dollars per year for the company. There were pros and cons as to conducting this type of project in an ASC. Introducing the CNL role to a small facility proved to be a challenge initially since the role was unchartered territory and staff members were having a hard time distinguishing whether my role was as a staff nurse or of a supervisory role. After clearly explaining to the staff that my purpose was to lead the team on this improvement project at the microsystem level and serving as a resource, many were in support of the project and were willing to contribute their assistance.

Though it was slightly disappointing not being able to implement the project and seeing the outcome as planned, I remain confident that the project will serve its purpose once it's implemented and will have a positive impact on the organization and the patients it serves.

This project would not be possible without the full support of my professors, the staff at the ASC, my clinical nurse manager and my preceptor. I am both humbled and honored having been presented the opportunity to learn from the best in both the academic and professional setting. Through this project, I have gained experience and knowledge that will greatly assist me in my future endeavors as a Clinical Nurse Leader to provide care in true Ignatian-Jesuit spirit of

cura personalis – to care of the person as a whole (Ignatian Spirituality website, 2009-2017).

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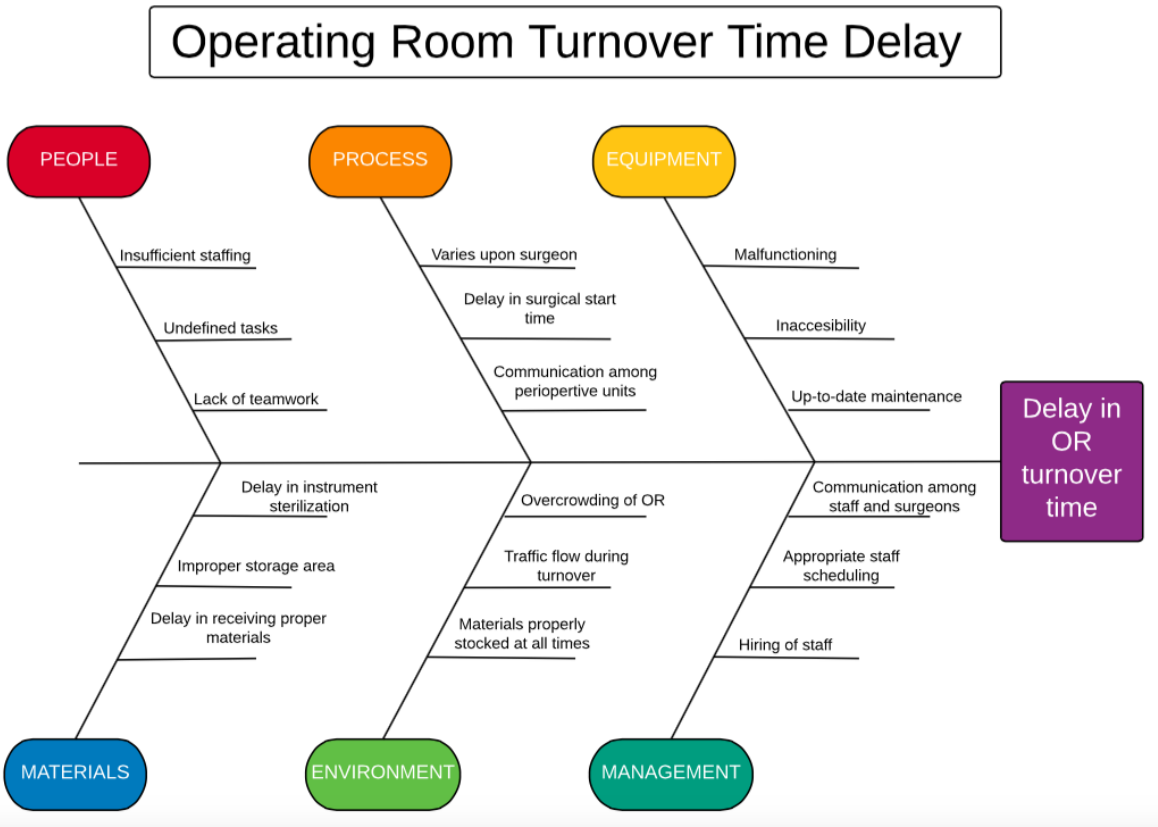
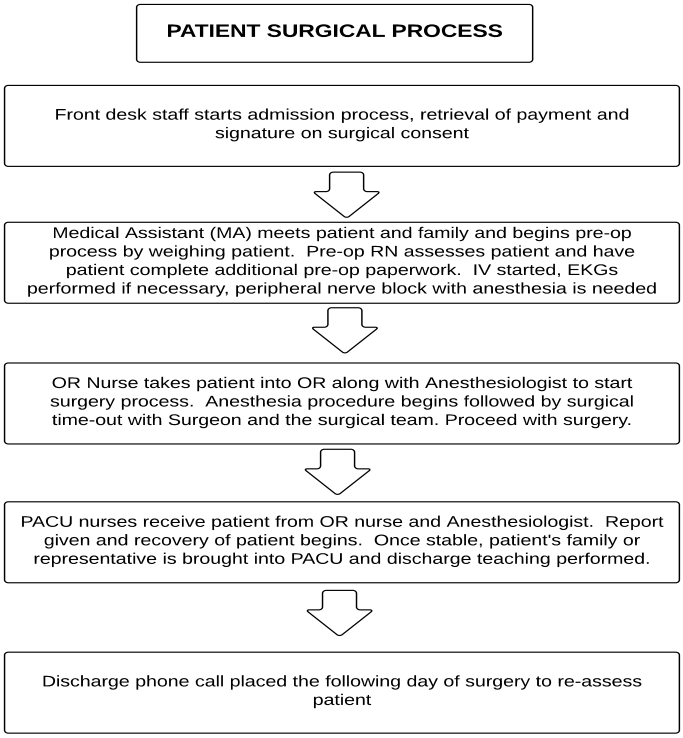
Appendix A

Root Cause Analysis – Fishbone Diagram

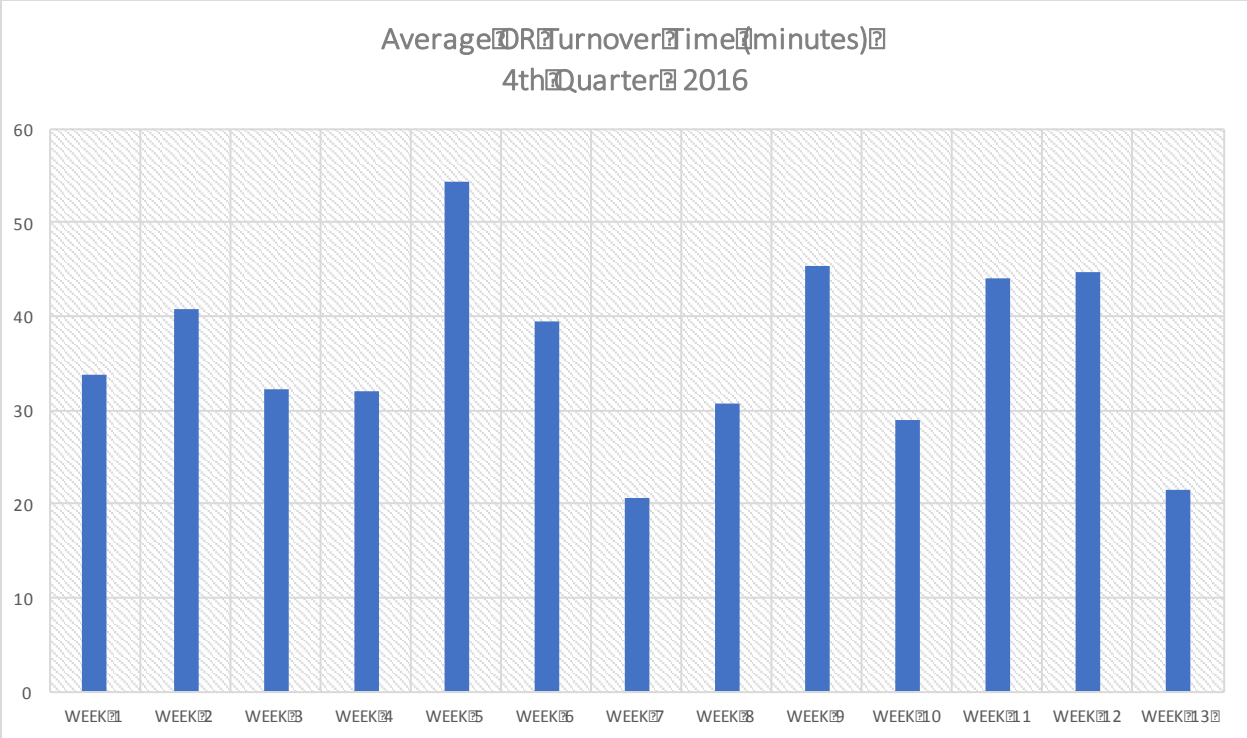


Appendix B

Ambulatory Surgery Center Flowchart



Appendix C



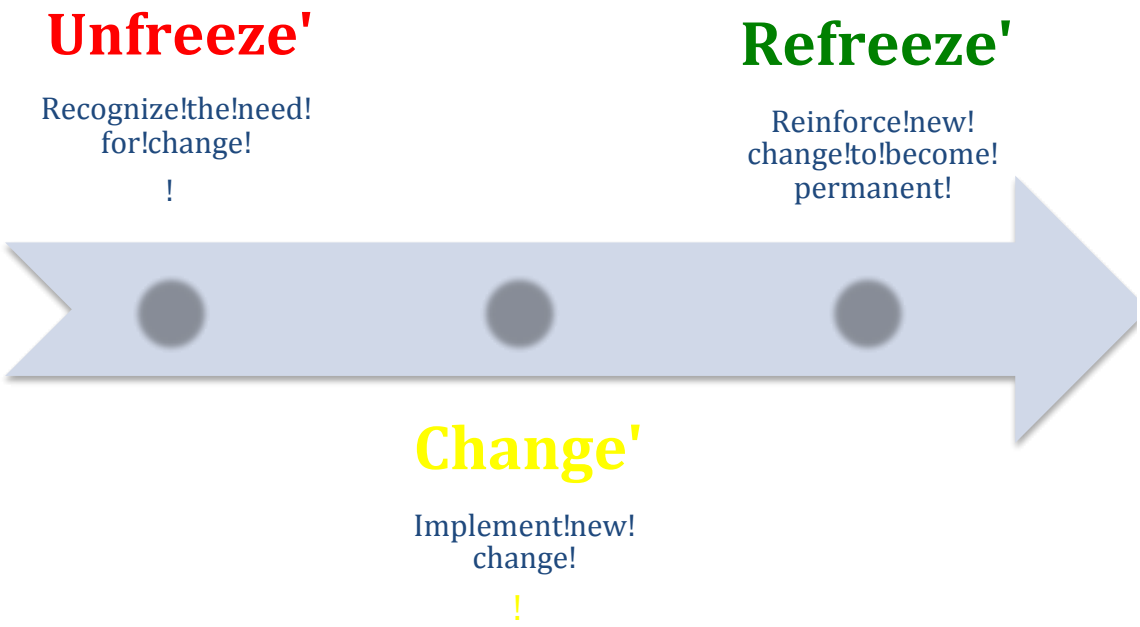
Appendix D

Reducing OR Turnover Time Cost Analysis

Training Cost		
Item	Average hourly salary	Cost per training
RN Circulator x 3	$60.00	$180.00
RN Leader x 1	$62.00	$62.00
OR Scrub tech x 3	$55.00	$165.00
OR staff support x 2	$18.00	$36.00
Total:	**$195.00**	**$443.00**
Cost for In-service training x 2 hours	$195.00	$886.00
Cost of reconfiguring OR materials x 4 hours	$195.00	$1,772.00
Total:		**$2,658.00**
Turnover Cost		
Item	Average minute salary	Cost per turnover
OR Team salary	$2.22	$79.80
Projected Savings (Based on average 8 cases/day)		
Item	5% decrease in TOT	10% decrease in TOT
Hourly	$3.99	$7.98
Daily	$31.92	$63.84
Weekly	$159.60	$319.20
Monthly	$638.40	$1,276.80
Yearly	**$7,660.80**	**$15,321.60**

Appendix E

Lewin's Theory of Change



Appendix F

OR Turnover Time Reduction Project Timeline