

2021

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Decreasing Same-Day Preoperative Delays and Cancellations:

A Quality Improvement Project

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Date of Submission: May 15, 2021

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Abstract

A well-run preoperative anesthesia clinic (PAT) is essential to ensure and enhance the delivery of safe and quality care. Deficiencies in multidisciplinary communication between providers (surgery, primary care, anesthesia, PAT nurses, and consultants) affect patient health status preoperatively decreasing quality and safety in the surgical suite. There is a need for the best interventional strategies to avoid increased delays and cancellation rates.

Purpose: To identify and define the potential issues causing delays and cancellations in the PAT clinic and create a multidisciplinary team communication and collaboration checklist of preoperative patient status and consulting needs centralized between stakeholders.

Method: Utilization of the Plan-Do-Study-Act (PDSA) model for implementing interventions to identify issues in a PAT (pre-anesthesia testing clinic) that increased delays and cancellations. The providers utilized a semi structured questionnaire and interview, an implementation checklist and post implementation questionnaire to identify and correct preoperative issues that increased delays and cancellations.

Results: The results showed that increasing communication between the multidisciplinary teams decreased the incidence of preoperative delays and cancellations. Even though the findings can be generalized due to low patient numbers the checklist has the potential to improve workflow throughout the preoperative process. One important theme identified was how communication pathways resulted in improved cohesiveness, reduced fragmentation of care and improved patient assessment preoperatively.

Conclusion: Improved workflow and communication between multidisciplinary teams result in improved decision making, improved outcomes and increased quality of care. Consistent

education and awareness are needed to reduce communication variability in a PAT clinic for future quality improvement success .

Keywords: pre-anesthesia testing unit (PAT), preoperative assessment, perioperative process

Introduction

Decreased standardization and centralization of the preoperative assessment process increases the risks of surgical delays, cancellations, and suboptimal patient health status preoperatively (Irizarry-Alvarado et al., 2018). Deficiencies in multidisciplinary teams' communication exacerbate these problems due to a lack of established practice improvement tools, methods, and strategies beginning with the first surgical visit and leading up to the day of surgery. These causative factors affect the multidisciplinary teams' integration of downstream patient information resulting in poor decision making and reduced quality patient care with reported cancellation rates ranging between 5% to 40% (Leite et al., 2019). This lack of integration results in a significant waste of resources, creating poor utilization of informatics systems, reducing pertinent information, and decreasing the distribution of this information between health care providers. (Silvay & Zafirova, 2016).

Background

Unexpected delays or cancellations of elective surgeries impact hospital performance and leads to undesired patient outcomes (Talalwah & McIltrout, 2018). The importance of financial implications and waste of resources are significant concerns. However, cancellations affect the hospitals' bottom line, and patients and their families (Tan et al., 2019). Reasons for cancellations do vary however, with the improvement of the quality of the preoperative clinic assessments and cooperation and communication between multidisciplinary systems, Tan et al. (2019), estimates a decrease of cancellations and delays by 20% an increase in operating room flow by 35%. Once adequate strategies are established quality improvement can be achieved. Research evidence indicates a strong positive correlation between healthcare teams' communication skills and its profound impact on patient safety (Frankel et al., 2017).

Implementing effective team management strategies will help overcome the numerous challenges due to the widespread flow of information between multiple providers decreasing the risk of miscommunication preoperatively. Communication is a critical component in effective teamwork. By overcoming the issues associated with poor communication among healthcare providers they can navigate competing priorities to decrease delays and cancellations.

Problem Statement

There is a need for the best interventional strategies to avoid increased cancellation rates. The lack of protocols and pathways early in the preoperative assessment process leads to an overall decrease in patients' health status and subsequent poor-quality healthcare. These deficiencies limit effective communication between multidisciplinary teams resulting in surgical delays and cancellations. By establishing a specific downstream communication framework, between stakeholders, a resource-efficient PAT clinic can be established eliminating inefficiency and poor optimization of patient health status preoperatively. Once implemented, health care quality is improved resulting in decreases in delays and cancellations preoperatively.

Review of Literature

A comprehensive search of the literature for evidence of decreasing preoperative surgical delays and increasing efficiency in a PAT clinic included the following databases: Cumulative Index of Nursing and Allied Health Literature (CINAHL) and PubMed. The following Medical Subject Headings (MeSH) terms were used: preoperative anesthesia assessment and patient safety, surgery cancellations and preoperative anesthesia assessment, preoperative anesthesia assessment and efficiency. Articles retrieved from the search were 195, 85 and 107 respectively, using the selected MeSH terms. Inclusion criteria consisted of full-texted articles published in

English. To capture the current evidence, the search was narrowed to 18 articles published between 2006-2019 of articles that pertained to improvement and efficiency of a PAT clinic with a focus that impacted safety, efficiency and roles limiting cancellations and delays in a PAT clinic. The resulting articles were evaluated based on the John Hopkins Nursing Evidenced-Based Appraisal (JHNEP) for strength, level of evidence and quality (Dang & Dearholt, 2017). Articles greater than 10 years were excluded except for a systematic review (Correll et al., 2006) and a descriptive improvement study (Gilmartin et al., 2009). Both were included due to good quality guides with sufficient evidence identifying issues preoperatively (level III B) and implementing practice improvement initiatives. Other Level III studies were categorized as follows: three retrospective studies (Leite et al. 2019, Tan et al. 2019, & Silvay and Zafirova 2016), three systematic reviews of quantitative research (Conny et al. 2016, Irizarry et al. 2019, & Talawah and McIlrot, 2019) and one qualitative research study (Lancaster et al., 2015). Three observational reviews were included, involving questionnaires (Harnett et al., 2010, Park et al., 2019 & Hagaman et al., 2018). This was followed by three-level IVA studies which included practice guidelines for building a better preoperative clinic (Siragusa et al., 2011), and a multidisciplinary quality improvement project optimizing preoperative clinic models (Irizarry et al., 2019). Finally, two quality improvement reviews determining risk and productivity in a PAT clinic (Taiq et al., 2016 & Varughese et al., 2013) were also included in this literature review.

Synthesis

Most surgical delays and cancellations were found to be preventable. Management of identified medical issues in the preoperative clinic and perceptions of all stakeholders (surgery, anesthesia, nursing and patient) involved working together, and impacting efficiency and delays and cancellations in the operating room setting (Correll et al., 2006). This medical optimization

and patient-focused assessment preoperatively prevented unnecessary consultations and reduced the probability cancellations and delays resulting in higher quality patient care. Tariq et al. (2016) determined that the role of the preoperative clinic in identifying risk factors employing a multidisciplinary approach, decreased preoperative morbidity and mortality. Furthermore, improvement of a multidisciplinary approach that is standardized, instituted in a timely and cohesive manner is a fundamental factor for effective perioperative management (Irizarry et al., 2018).

Attitude, satisfaction and active participation of stakeholders through continuous assessment and feedback, is another key component in the initiation of this quality improvement (QI) project. Park et al. (2019) felt that it was critical to explore the level of satisfaction of surgeons related to improved quality in a PAT clinic. This attitude perception implies that by applying evidence-based protocols across the multidisciplinary teams, there is variability reduction, improved outcomes, and creation and optimization of patient care practices. It was found that these protocols promoted active participation, specifically through dialogue, inclusion and discussions between team members leading to an agreed set of principles that improved assessment of surgical patients preoperatively (Gilmartin, Chin & Leonard, 2009). Peer support and interdisciplinary cohesiveness, and its importance, has been documented as an interventional strategy and is critical to preventing errors and enhance quality safe patient care in the hospital setting. This qualitative phenomenological study reiterates the importance of decision-makers recognizing each other's knowledge and expertise improving communication and enhancing patient safety (Lancaster et al., 2015). Even though this study was not focused on surgical implications, it did examine the importance of communication and collaboration between health care providers and their importance in safe quality care.

Conny and Yim (2016) found that reinforcement of standardization and centralization of preoperative assessment documentation reduces unnecessary day-surgery cancellations and results in quality improvement across the perioperative care setting. Siragusa et al. (2011) stated that structuring and prioritizing patient needs and co-morbidities between stakeholders to identify important risk factors that initiate proper testing and consultation limits future delays and cancellations prior to surgery. Hagaman et al. (2018) identified that incomplete medical history and lack of downstream communication pathways during the preanesthetic process clarifies and consolidates pertinent information between team members. These adequate assessment pathways result in higher quality clinician's cooperation and reduce fragmentation of care pre, intra and postoperatively. Reduction of fragmentation avoids the variability that results in clinician disparities and focuses on the improving the workflow and effective communication, all of which are essential components of quality care throughout the surgical process. These pathways also promote cohesive care that directs the patient through the entire surgical process. Furthermore, institution-specific standardized and thorough guidelines, that are clear, evidence-based, minimize poor patient outcomes (Hagaman et al., 2018). However, there were limitations, specifically in the QI article, because it was a single-center project, it lacked generalization to other medical and surgical clinics where electronic health records (EHRs) were used and did not observe patient outcomes and process metrics.

Limited studies examined the positive and negative effects of a well-run PAT clinic and how the preoperative assessment process is a catalyst for process efficiency, safety and quality care outcomes. One study focused on the importance of an advanced practice nurse (APRN) as a primary leader in a PAT clinic (Sebach et al., 2017). One study analyzed the effectiveness of an APRN coordinating, assessing, educating, and minimizing elective surgery cancellations (Conny

& Wan-Yim, 2016). They reported that a multidisciplinary approach delineating clinical guidelines, pathways and protocols was advocated to optimize patients' status preoperatively. This approach was validated by Irizarry-Alvarado et al. (2019) that initiated a QI project that determined team building and creation of a collaborative work environment based on trust and mutual respect was critical in identifying root causes for medical optimization preoperatively. This QI project resulted in a 14% improvement in operating margin, and a 24% improvement in staff satisfaction. Sebach et al. (2015) examined if the lack of standardization and collaboration between surgeons, patients and primary care providers resulted in uncoordinated and costly preoperative care in a nurse practitioner-led PAT within a multispecialty orthopedic clinic. Prior to its implementation the PAT clinic lacked uniformity, contributing to unnecessary surgical cancellations. Following implementation, the number of patients medically optimized for surgery and group revenue were increased.

Gaps in Research

The studies included in this literature review utilized communication and collaboration resources to improve patient safety with the aim to build a better preoperative patient care model with less surgical cancellations and delays. In many of the studies, the value of the preoperative clinics in identifying patient issues operating room (O.R.) efficiency was directly related to positive patient surgical outcomes pre, post and intraoperatively. These studies correlated with one another with a focus on multidisciplinary teams' need to allow downstream communication. However, limited articles utilizing QI initiatives were lacking that showed gaps in research that could not be rectified to demonstrate each department's role in building a better PAT clinic. Additionally, the studies available do not delineate whether hospital size, nurse-led, APRN-led or anesthesiologist-led PAT clinics are statistically significant for patient safety and quality care.

Theoretical Framework

The Stetler Model of Research Utilization to Facilitate Evidenced-Based Practice initiates a QI effort employing research utilization (see Appendix A) (Stetler, 2001). This model helps practitioners integrate research findings and apply other relevant data, into everyday practice. Stetler created five phases, with each phase designed to facilitate critical thinking about the practical application of research findings, to use of evidence in the context of daily practice, and to mitigate some of the human errors made in decision making (Stetler, 2001).

Phases of the Stetler Model include:

1. Preparation
2. Validation
3. Comparative evaluation/decision making (synthesis and decisions/recommendations for criteria of applicability)
4. Translation/application (operational definition of use/actions for change)
5. Evaluation (alternative types of evaluation)

Most of the features of this framework incorporate steps of the research process and focus on bringing the best in safe and effective quality nursing care to the patient.

The Stetler model guide this QI project initially preparing to identify and define the potential issues causing delays and cancellations in the PAT clinic. Even though there were limited scientific studies, evidenced-based practice models and guidelines are available in the literature to identify the potential problems that could exist. Analysis of these problems will be based on a survey that will help determine desired outcomes. These findings consist of

incorporating collaboration and communication in the PAT clinic and will be used as detailed qualifiers that validate a need to focus on stakeholders involved in the preoperative process. When compared and evaluated these findings will be cumulative and will help determine recommendations needed for a well-run PAT clinic. Finally, Stetlers' model will help focus the projects level of use between the stakeholders utilizing changes in strategy to achieve the overall goal of what constitutes effectiveness in the PAT clinic with outcomes that are goal-oriented and offer summative evaluation strategies.

Project Design

Quality improvement project designs and models need to be approached using tools that approach performance in a structured and consistent way. Utilization of the PDSA Model allowed the DNP student to implement interventions to evaluate, change, improve and then re-evaluate the QI project (AHRQ, 2015) and measure data outcomes to identify issues or departments that the stakeholders believed cause delays and cancellations. Semi -structured questions and interview results were followed by checklist implementation then a post implementation checklist utilization questionnaire identified inconsistencies between the stakeholders and to get a better grasp on what identifiers they saw as important catalysts causing delays and cancellations. An attempt was made to identify team members who are motivated for positive changes for the clinic and help foster safe quality care environment.

The "Plan" for the project was initiated with conversations with the Director of Surgical Services who is currently in charge of the PAT clinic. These initial discussions focused on the quality improvement needs of causes related to same-day surgical delays and cancellations. This planning stage continued with a review of literature identifying the causes and ways to promote and improve factors impacting the department. The planned question was how a change in

downstream communication and collaboration to decrease delays and cancellations. A semi-structured interview included five open ended questions developed by the DNP student that was utilized to identify if decreases in delays and cancellations occurred and then re-evaluated prior to a possible second PDSA cycle.

The “Do” stage was initiated by the DNP student compiling the information from the open-ended questionnaire and interviews that helped identify where each stakeholder believed what issues constitute poor outcome. Problems and observations were documented, and a standardized documentation checklist was created, by the DNP student, to establish a better communication bridge between stakeholders. Once deemed sufficient the checklist was distributed to all of the stakeholders for utilization in their offices and preoperative clinic.

The “Study” portion of the project involved identifying if a positive outcome occurred with a less than 1 % delay and cancellation rate post documentation implementation. The DNP student calculated the percentage of delays and cancellations preoperatively over the specific timeline and reviewed and compared the rates pre and post implementation. Also, an interview with stakeholders continued, to discuss their feedback, subsequent needs and perceptions of the QI project. Information gathered was presented to each stakeholder involved to help identify interventions that can further effectiveness in the PAT clinic.

In the “Act” stage interventions were evaluated and future interventions modified, by the DNP student with consultation with the director of surgical services, identifying the barriers and implementing educational protocols that minimized effectiveness preoperatively. Also, review of the project results in preparation for the next PDSA cycle by identifying modifications, and changes in documentation to increase quality improvement in the future. Finally, sharing the results and findings of surveys and interviews after project completion were initiated for greater

communication and continuation of safe and effective preoperative care. Focus on existing pre intervention data reflected how the system previously functioned. Changes and improvement were measured utilizing performance measures that focused on quantitative , number of delayed or cancelled cases over the designated time period and its comparison both pre and post intervention. The identified qualitative data utilized content analysis research method, that observed current standardized preoperative guidelines and monitor performance changes, based on provider interviews pre and post checklist implementation. All stakeholders in interviews identified opportunities for improvement and elicited independent observations.

Methods

Gap Analysis of Project Site

Total joint and orthopedic spine patients have a high prevalence of co-morbidities which impacts preoperative assessment and surgical outcomes (Inacio et al., 2015). This project was implemented at a private non-profit 189 bed community hospital located in Massachusetts. The sample population included preoperative orthopedic total joint and spine patients with ASA clinical status I-III. Key stakeholders involved PAT nursing (4), orthopedic surgeons (5), and anesthesia (1). A cost benefit analysis is provided (see Appendix B). Qualitative data collection involved semi structured group interviews and questions, independent observations and discussions that were used to provide the context needed for improvements. Non-key stakeholders involved surgical booking staff that were not surveyed but helped with increasing the DNP students' knowledge of the surgical booking process starting with initial surgery booking confirmation.

Currently, our facilities' delays and cancellations occur due to inefficiencies identifying and agreeing on the patients' consultation needs preoperatively . This gap in patient preoperative assessment reinforced the need for accurate, comprehensive and standardized methods to identify present co-morbid conditions and to eliminate delays, cancellations, and reduce surgical risk.

To develop and establish a resource-efficient pathway in the preoperative clinic, a gap analysis was performed, which focused on two key problem- solving initiatives:

1. Instituting protocols and pathways early in the preoperative assessment process that increased patient satisfaction, operating room efficiency, proper testing and consultations in a timely and organized manner.
2. Creation of a checklist that relayed adequate communication and documentation of patient health problems between multidisciplinary teams involved to avoid patient pre-surgical delays and cancellations

This QI project implemented a practice/process improvement plan that utilized the Plan-Do-Study-Act model (PDSA) (see Appendix C) that broke down interventions to evaluate, change, improve and then re-evaluated performance improvement in a PAT clinic (Agency for Healthcare Research and Quality AHRQ, 2015). This PDSA model focused on investigation of the problem, identified adaptations and follow-up steps regarding the problem, reviewed the changes and successes, and finally tested the change. Standardization of preoperative documentation was the major catalyst of change utilized with these methods, this was applied to understand issues, test potential solutions, and develop a sustainable process in a PAT clinic. This project also identified causes of delays and cancellations between multidisciplinary teams and improved downstream communication issues therefore increasing surgical quality and safety beginning with the PAT clinic. Quantitative and qualitative methods were used, involving a

semi-structured interview guide with stakeholders, a standardized provider checklist and a post-utilization questionnaire that evaluated outcomes post-implementation.

Project Goals

This quality improvement project (1) identified and defined the potential issues causing delays and cancellations in the PAT clinic (2) created a multidisciplinary team communication and collaboration checklist of patient preoperative status and consulting needs centralized between stakeholders . The goal of this QI project was to decrease same-day surgical delays and cancellations in orthopedic total joint and spine patients preoperatively.

- Goal 1: increased interdepartmental communication between stakeholders
 - Objective: Implementation of a survey and interviews with stakeholders to clarify the process and identify potential failures in the system and discuss ways for improvement
 - Outcome: There was identification, pre-checklist implementation, of downstream communication issues that affected delays and cancellation. These communication issues previously caused delays and cancellations of 4%.
- Goal 2: present standardized documentation checklist to be utilized from surgical booking until day of surgery
 - Objective: Administer a preoperative checklist that will be assessed with communication parameters resulting in improvement of delays and cancellations with a follow up questionnaire to identify if parameters were met.

- Outcome: There was an increase in collaboration, determined between multidisciplinary teams utilizing the checklist that solved problems associated with delays and cancellations.

Measurement Instruments

In order to measure the outcomes of this DNP Project the following instruments were used. Each questionnaire was developed by the DNP student. A five semi-structured open-ended question interview guide that provided simple and comprehensive feedback about patient evaluation, operative delays, cancellations and downstream communication issues preoperatively. Once this questionnaire was obtained, a follow-up short interview process questionnaire with the stakeholders determined multidisciplinary actions needed to create communication consistencies between PAT clinic departments. The input from the stakeholders included conversations of ways to create better communication protocols in each department that helped future PDSA cycles.

Follow up discussions measured and identified incongruencies in documentation from surgical booking until the day of surgery beginning with the initial booking of the surgical procedure day of surgery. This measured whether the lack of verbal communication between multidisciplinary teams about patient comorbidities increased delays and cancellations.

Finally, a follow-up communication assessment checklist utilization questionnaire identified if preoperative communication parameters were met.

The semi-structured interview guide and process (see Appendix C) was used to provide the context needed for improvement.. This guide was the initial measurement tool identifying communication gaps between multidisciplinary teams during the initial surgical booking process.

Qualitative data utilizing individual discussions were used to capture the incongruencies in checklist documentation and the multidisciplinary communication causes of surgical delays and cancellation rates. Existing PAT data was evaluated with the current system of previous causes of delays and cancellations which helped defined and adopt standardized performance measures. The qualitative data gathered from the open-ended questions and interviews was organized and analyzed for trends to continue to improve future PDSA cycles.

Following the open-ended interview questions and interview process comments and feedback was identified a standardized preoperative checklist (Appendix D) was developed by the DNP student that evaluated communication failures that resulted in preoperative delays and cancellations. This checklist consisted of the most recent evidence-based information to provide factual information that identified multidisciplinary communication issues preoperatively, identified if multidisciplinary teams communicated effectively and identified lapses in downstream communication that lead to delays and cancellations preoperatively. This checklist followed ten unidentifiable total joint/spine patients from surgical booking until day of surgery. Patient cases were discussed following the HIPAA guidelines on confidentiality in order to evaluate the quality of the interventions and outcomes. Percentage of delays and cancellations were compared with total joint/spine cases cancellations and delays three months prior to this quality improvement study and checklist implementation. Rates of cancellations and delays were compared and reviewed with the multidisciplinary team members who were then given the opportunity to ask questions and provide feedback about the results.

In order to measure post implementation outcomes an assessment questionnaire was then developed by the DNP student to identify if communication parameters were met preoperatively. This questionnaire focused on comments and feedback from the multidisciplinary

team and were noted for commonalities and differences and was used to modify and adopt better strategies to decrease delays and cancellations. Data derived was also used for future PDSA cycles.

Ethical Considerations/Protection of Human Subjects

The University of Massachusetts, Amherst (UMass) Internal Review Board (IRB) approval was obtained prior to initiating the DNP Project (see Appendix G). The goal of this QI project focused on decreasing same-day surgical delays and cancellations. This project did not involve any research activities on human subjects and no patient specific health history was obtained so confidentiality was not be an issue since the target population were the providers. All data related to co-morbidities of unidentified patients preoperatively were kept confidential and patient identifiers were not provided through completion of the project. Participation of stakeholders was voluntary and followed the standards of care of the hospital without compromising the quality of care. All hospital data was stored in password protected files and computers.

Results

The DNP student first reviewed the semi structured five open ended interview questions (see Appendix D) with stakeholders. All of ten providers filled out the open-ended questionnaire (orthopedic surgeons (n=4), PAT nurses (n=4) anesthesia providers (n=2) between January 4, 2021 and January 22, 2021. The pre-implementation questionnaire determined that nearly all participants believed current issues with surgical delays and cancellations caused inefficiency of the preoperative evaluation process with one undecided based on a disagreement as to whether who would be at fault for the inefficiencies. Also, the participants indicated the need for

congruency and communication collaboration between all multidisciplinary teams was needed to limit delays and cancellations. Additionally, all participants agreed on the implementation of standardization of preoperative documentation would significantly improve the preoperative process. Irizarry et al., (2018) identified the importance of a standardized multidisciplinary approach as the fundamental factor for effective perioperative management. This importance was indicated by the results of the pre-implementation questionnaire and interviews.

A content analysis was used to determine the results of the pre-implementation questionnaire interviews are described in Table 1.

Table 1 . Pre-implementation questionnaire interview results			
Themes	Categories	Codes	Quota from participants
Factors effecting delay and cancelation	Surgeon related factors	Lack of surgeon support	“Surgeons think that it is our total responsibility to get all the information on patients even though they don’t send the primary information accurately”
		Limited information from surgeon / limited communication with surgeon	“It’s stressful when you start out with limited preoperative information from the surgeons’ office and are unable to move forward quickly to have the patient ready for day of surgery”
		Lack of support from other units	“It would be nice if anesthesia helped us figure out a way to make it easier to get the right information from the surgeons office”
	Documentation related factors		The preoperative documentation can be scattered and lack cohesiveness”
	Healthcare Team related factors	Miscommunication/ Misperception	“Fixing the problem involves getting all of us on the right page during the evaluation “
		Expectation from other team members	“I can’t be involved in both the surgery and the preoperative process. My office takes care of sending patient information”

The pre implementation questionnaire interviews identified three factors that providers believed affected delays and cancellations. This involved the surgeons' input, poor documentation and healthcare team related factors which validated poor downstream communication issues in the PAT clinic. The lack of support between providers and expectations of each group caused a lack of cohesiveness which led to documentation issues preoperatively. This deficiency of a standardized multidisciplinary approach was identified by Irizarry et al., (2018) as the fundamental factor for ineffective perioperative management.

After the participants filled out the questionnaire and interviewed, a standardized provider preoperative checklist was created by the DNP student. This checklist identified if downstream communication issues occurred between multidisciplinary teams during the preoperative process resulting in delays and cancellations.

Ten total joint/ orthopedic spine surgeries were identified to utilize the standardized preoperative checklist (see Appendix E). Unfortunately, this low patient number was related to a decrease in elective surgical case load due to Covid-19. Implementation of the preoperative checklist showed that there were incongruencies in communication between providers. This was identified on the initial surgical booking forms on a specific patient comorbidity and the need for consultation, however this inconsistency did not result in any delays or cancellations . During the checklist implementation anesthesia and PAT (pre-anesthesia testing) nurses provided verbal feedback. They determined that their ability to efficiently schedule and verify patient health history and consultation needs relied on the initial surgical booking form information. Once this downstream communication was initiated they could accurately assess patient preoperative needs efficiently. This information was validated on the checklist protocol review that noted no downstream communication issues regarding PAT and anesthesia needs and questions and

answers with verifying patient preoperative needs for the ten study surgeries, except for the incorrect booking information by the surgeons’ office. The surgeons verbally mentioned difficulty with the surgical booking form, however seemed to feel that it was anesthesia and the PAT clinics’ responsibility to be the evaluators of comorbidities and subsequent consultations preoperatively. A verbal explanation of evidenced based practice articles was presented identifying the importance of multidisciplinary collaboration preoperatively.

Finally, stakeholders were provided with a post implementation communication checklist utilization questionnaire and follow up post implementation interviews (see Appendix F) to identify the positive outcomes. Unfortunately, only five of the ten were returned anesthesia (N=2), PAT nurses (N=2) , and surgeons (N=1). These providers felt that all preoperative parameter questions were identified, validated and the standardized checklist resulted in an improvement of delays and cancellations during the implementation period (less than 1% in delays and cancellations), however they did verbally express the need for improvements.

A content analysis research method was used to determine the interview results of the post-implementation questionnaire are described in Table 2.

Themes	Categories	Codes	Quotations from participants
Positive effect of checklist	Preoperative communication parameters were met	Positive feedback with the checklist from the providers	“The checklist helped with communication issues. It was easier to follow up with each other knowing that we were all responsible identifying patient issues”

			<p>“The checklist definitely helped with identification of most preoperative needs allowing us to identify communication breakdowns between providers. Once this was identified we could call them and fix the problem.”</p>
<p>Areas that need more innovative ways to improve</p>	<p>Documentation issues</p>	<p>Documentation is antiquated</p>	<p>“If we had computerized documentation, it would help move the process more efficiently”</p>
			<p>“A computerized system would help with communication issues and avoid future delays and cancellations”</p>
			<p>“Will we ever have computerized documentation? This may make it easier to communicate patient issues”</p>
<p>Difficulties implementing the checklist</p>	<p>Provider expectations</p>	<p>Lack of cohesive support</p>	<p>“The pre-anesthesia testing clinic (PAT) should be responsible for identifying patients’ preoperative needs after my office books surgery</p>
			<p>“The checklist helped but my job is surgery, and my office finds the paperwork cumbersome”</p>
			<p>“We could do a lot more to help communicate patient issues with anesthesia and surgeons”</p>

The post implementation checklist interviews identified positive feedback identifying patient issues with improved communication between providers. However, areas of improvement were identified by all providers. Two providers spoke of the need for more surgeon communication in a timely manner about patients' preoperative status. This was brought up to the surgeons who initially disagreed, however identified verbally a need to specifically standardize computerized preoperative documentation with anesthesia and PAT, in future PDSA cycles. Documentation issues were also identified due to a lack of computer access needed between all providers to avoid future delays and cancellations. This caused a lack of cohesive support between providers quickly identifying patients' needs preoperatively. Improvement of these practice guidelines affecting PAT clinic delays and cancellations will result in building a better preoperative clinic in the future.

Discussion

The results of the of the checklist implementation showed that increasing communication flow within departments decreased the incidence of preoperative delays and cancellations. Even though the unanticipated barrier of the pandemic and some stakeholder resistance affected patient number, the interviews of how communication pathways worked effectively helped identify future potential. Even though surgeon support was lacking, peer support from the other stakeholders, as suggested by Lancaster et al. (2015), lead to multidisciplinary cohesiveness and improved assessment of the surgical patients preoperatively. Also reduced fragmentation of care avoided the variability so all stakeholders could focus on improving workflow throughout the surgical process. Positive quality improvement across the perioperative setting were identified through structure and standardization reducing delays and cancellations, however low patient numbers could not fully validate success.

Pre pandemic total joint/orthopedic spine cases average 225 and 400 cases per year respectively. This number was drastically reduced due to the pandemic and allowed only ten (n=10) patients to be involved in implementation. However, identification of poor patient outcomes was minimized through guidelines in the checklist and promoted cohesive patient care which is instrumental for future success. (Hagaman et al., 2018).

The facilitators and barriers of this improvement project involved pandemic limiting patient numbers due to operating shut down and participation, primarily surgeon engagement, returning semi structured open-ended interview guides and involvement in the short interview process post-evaluation. Prior to and during implementation of this QI project there were concerns of the possibility of another failed attempt of an improvement project in the PAT clinic. This led to a decrease in involvement, however stakeholders were routinely reminded the importance of their participation. Involvement increased slightly and results were obtained that identified some communication inconsistencies between departments, however participation was still low. It appeared that the majority of surgeons did not want to participate in the process, however some did disclose privately to the DNP student their thoughts and comments about the project and issues with PAT department.

This quality improvement project addressed the importance of developing communication pathways to help identify and define potential issues in a PAT clinic. Issues potentially causing delays and cancellations were identified and focused on the overall goals of what constituted effectiveness in a PAT clinic. It initiated the Stetler Model of Research Utilization to Facilitate Evidence-Based Practice to integrate research findings into everyday practice (Stetler, 2001). Although there is limited evidence and guidelines specifically addressing potential issues causing delays and cancellations in a PAT clinic, there are studies that suggest incorporating a

multidisciplinary collaborative approach with effective communication and standardization will result in increased awareness that improves health care quality and promotes of safety and efficiency (Hagaman et al., 2018; Irizarry et al., 2018; Gilmartin, Chin & Leonard, 2009).

Conclusion

Improving workflow efficiency and standardization of preoperative patient care reduces preoperative delays and cancellations (Leite et al. 2019). This project focused on multidisciplinary communication, utilizing the PDSA model to assess, prioritize, and sustain standardization protocols to achieve this goal. It identified a collaborative work environment that objectively identified the root causes, which was crucial to strengthening coordination of care in the PAT clinic. After implementing the proposed changes, collaboration between stakeholders improved not only partnerships between healthcare professionals but created a healthier work environment resulting in quality patient care and decreases in preoperative delays and cancellations .

The qualitative information that was obtained through interviews and in open ended questions supported the quantitative information that was gathered that resulted in decreases in delays and cancellations from 4 % pre-QI project implementation to < 1% post QI project implementation.

There were several recommendations identified that may be considered for future quality improvement projects. The first recommendation is implementation of a computerized checklist between surgery, anesthesia and the PAT clinic that could rapidly assess patients' comorbidities and needs preoperatively. Currently our preoperative assessments at time of booking of surgery are paper charted causing delays in the transfer of patient health status. A second

recommendation is to nominate a facilitator to observe the preoperative process on a quarterly basis to establish future goals and respond back to all stakeholders involved.

Quality improvement is essential and must be a priority that is recognizable between all providers in healthcare to be effective. The understanding of evidence-based practice initiatives for implementation will help conceptualize then initiate measurable outcomes that will evaluate and deliver quality patient care.

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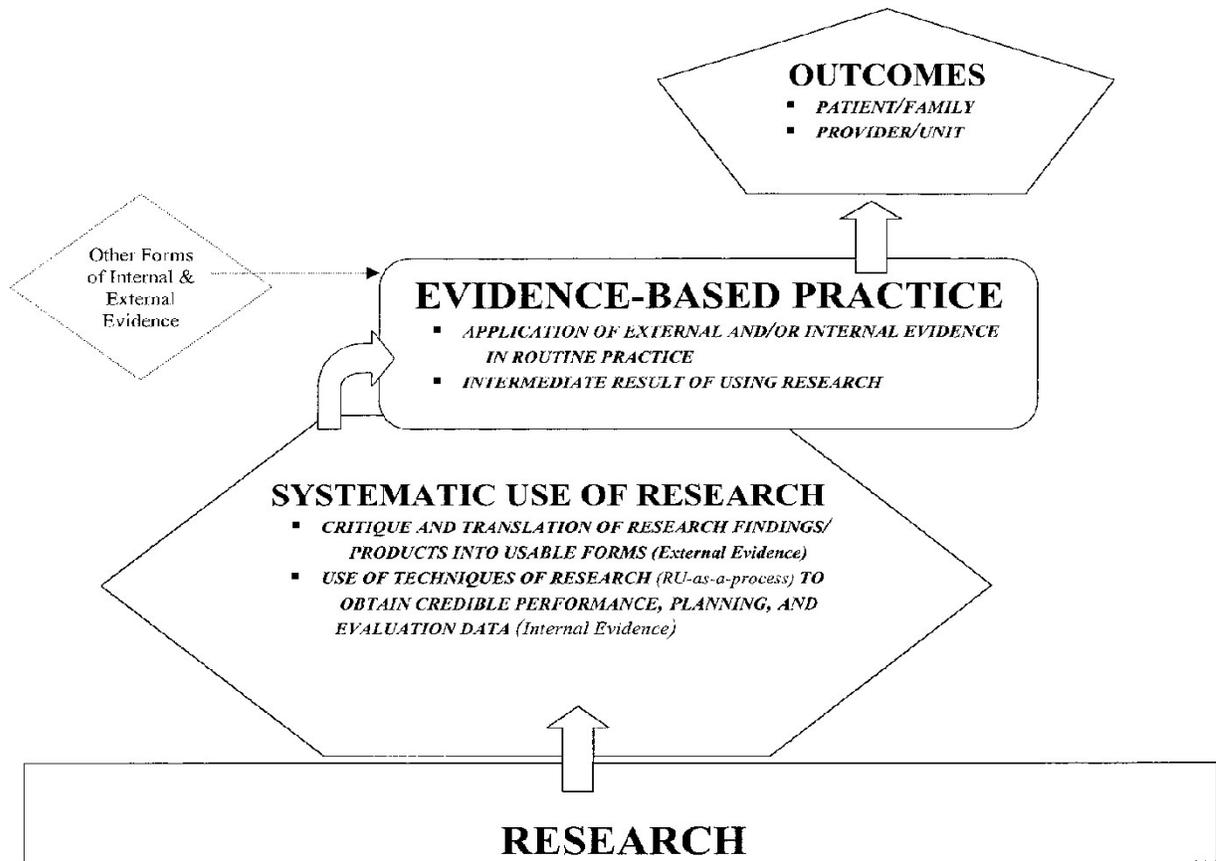
And Quality, Rockville, MD.

<https://www.ahrq.gov/evidencenow/tools/pdsa-form.html>

QI Essentials Toolkit: PDSA Worksheet. Content last reviewed February 2019.

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Appendix A- Stetler Model



Stetler Theory Model

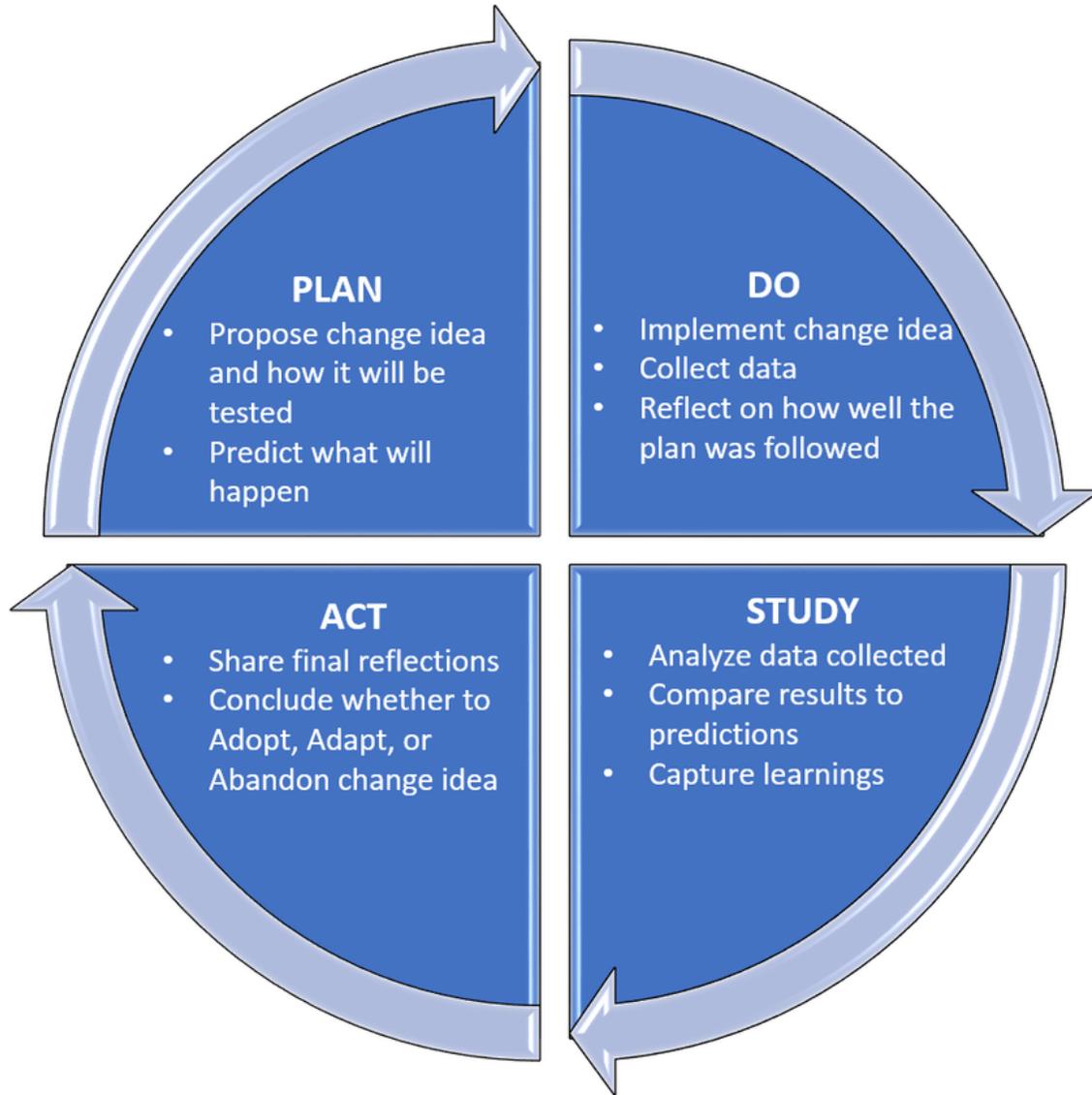
Stetler Model {Online Image}. Science Direct. www.sciencedirect.com

Appendix B

Cost-Benefit Analysis

Capital expenses for this quality improvement project presented are negligible. Personnel costs included those associated with training, assessments and additional time spent with the stakeholders during the survey and interview process. The cost for supplies was minimal and involved the cost of printing materials for surveys for all stakeholders. This cost was funded by the hospital as part of their involvement in the QI project.

Appendix C- Diagram PDSA Cycle



A visual diagram of a Plan-Do-Study-Act (PDSA) Cycle

PDSA Cycle {Online Image}. Research Gate. www.researchgate.com

Appendix D

Semi-structured five open ended interview questions.

1. Are surgical delays and cancellations currently a problem affecting your practice at this hospital?
2. Do you currently feel that the preoperative evaluation process can be improved to ensure efficiency, patient safety and quality care?
3. Is there a lack of congruency between multidisciplinary teams regarding the importance of limiting preoperative delays and cancellations?
4. Do you feel the primary problem is a lack of communication and collaboration between the multidisciplinary teams in preoperative evaluations?
5. Would standardization of preoperative documentation utilized between all disciplines significantly improve the preoperative process?

Appendix EStandardized Provider Preoperative Checklist

- _____ Surgery communicates on booking form and schedules patient with comorbidities for preoperative consultations, if needed.

- _____ PAT reevaluates anesthetic risk factors and verifies consultation needs from surgeons booking form

- _____ PAT clinic speaks with patient to verify health history and if comorbidity evaluation scheduling, if needed, was initiated

- _____ Questions and answers completed between PAT nurses and anesthesia team

- _____ Protocol review:
 - Booking sheet filled out correctly by the surgeons' office
 - Needs reassessed by PAT and anesthesia
 - Questions and answers with patient verifying

Appendix FCommunication Assessment Checklist Utilization Questionnaire*Instructions*

Please answer yes or no if preoperative communication parameters were met preoperatively

1. Did you feel that the PAT clinic reviewed the charts appropriately to identify if preoperative needs were met and thoroughly communicated issues in a timely manner to providers?
2. Did you feel the initial surgical assessment (@booking) was thorough and communicated to all providers involved?
3. Did you feel the surgeon identified/communicated the need for preoperative consultations, (for example: cardiology, pulmonology, hematology) within a sufficient time- frame?
4. Was there adequate time for the patient to be scheduled PAT phone visit, based on comorbidities and consultations needed, to be evaluated in a timely manner from surgical booking to day of surgery?
5. Did you feel the standardized checklist resulted in an improvement of delays and/or cancellations during the implementation period?
6. If you answered no to Question 5, what changes do you think are needed to better improve communication between providers and how do we improve our downstream communication for the future?

Appendix G- IRB Approval Letter**UMassAmherst**

Human Research Protection Office

Mass Venture Center
 100 Venture Way, Suite 116
 Hadley, MA 01035
 Telephone: 413-545-3428

Memorandum – Not Human Subjects Research Determination**Date:** December 22, 2020**To:** William Perry, College of Nursing**Project Title:** *Decreasing Same-Day Preoperative Delays and Cancellations***HRPO Determination Number:** 20-272

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination based on the information provided to our office:

- The proposed project does not involve research that obtains information about living individuals [45 CFR 46.102(f)].
- The proposed project does not involve intervention or interaction with individuals OR does not use identifiable private information [45 CFR 46.102(f)(1), (2)].
- The proposed project does not meet the definition of human subject research under federal regulations [45 CFR 46.102(d)].

Submission of an Application to UMass Amherst IRB is not required.

Note: This determination applies only to the activities described in the submission. If there are changes to the activities described in this submission, please submit a new determination form to the HRPO prior to initiating any changes. *Researchers should NOT include contact information for the UMass Amherst IRB on any project materials.*

A project determined as “Not Human Subjects Research,” must still be conducted ethically. The UMass Amherst HRPO strongly expects project personnel to:

- treat participants with respect at all times
- ensure project participation is voluntary and confidentiality is maintained (when applicable)
- minimize any risks associated with participation in the project
- conduct the project in compliance with all applicable federal, state, and local regulations as well as UMass Amherst Policies and procedures which may include obtaining approval of your activities from other institutions or entities.

Please do not hesitate to call us at 413-545-3428 or email humansubjects@ora.umass.edu if you have any questions.



Iris L. Jenkins, Assistant Director
 Human Research Protection Office

