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E-mail Instructions to Decrease Same Day Surgery Cancellations

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E-mail Instructions to Decrease Same Day Surgery Cancellations

Suji Ann John

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Abstract

Background

Same day cancellations on the day of the procedure are associated with poor quality of care, lower patient satisfaction, and higher healthcare costs. Cancellations are often the result of NPO (nil per os or nothing by mouth) violations, missed preoperative instructions, and patient illness. This quality improvement project explored email preoperative instructions as a means to decrease surgical cancellations on the day of the procedure.

Methods

Design and Setting

This quality improvement project was implemented in a large pediatric facility using convenience sampling to evaluate the effectiveness of emailed preoperative instructions along with preoperative phone calls to decrease same day surgery cancellations. The project was implemented in four outpatient surgical services.

Implementation and Data Analysis

Retrospective and prospective data were gathered from the electronic medical records. Pre-intervention data was gathered from 6/12/2017 to 9/15/2017. The emailed preoperative instructions were implemented in four surgical services over a 13-week period. Implementation and post-intervention data were gathered from 10/15/2017 to 1/12/2018.

Data collected was analyzed using SPSS. The chi-square and Mann-Whitney U test were used to measure the statistical significance of emailed preoperative instructions to decrease surgical cancellations.

Results

Although not statistically significant, results yielded clinical significance. In most instances, there were fewer same day cancellations when parents/guardians received emailed preoperative instructions.

Conclusion

Emailed preoperative instructions enhances medical communication and provides parents and guardians a retrievable reference of NPO (nil per os or nothing by mouth) guidelines, patient illness considerations, medication recommendations, and arrival times.

E-mail instructions to Decrease Same Day Surgery Cancellations

Introduction/Background

Surgical cancellations on the day of procedure are costly for both patients and health care facilities. For patients and their families, same day cancellations can result in emotional distress, missed working days, possible worsening of symptoms, and lengthy admissions (Schuster et al., 2011). For health care facilities, case cancellations can lead to loss of fixed operating room (OR) revenue, decreased patient satisfaction scores, and decreased quality of care (Xue, Yan, Barnett, Fleisher, & Liu, 2013; Schuster et al., 2011). Same day cancellations have significant financial implications for healthcare facilities. Cancellations on the day of procedure are expensive and waste resources (Pratap et al., 2015). According to Marcario (2010), OR time is estimated at $15 to $20 per minute, thus cancellations result in significant loss of revenue. The financial implications of same day cancellations may be prevented with adherence to firm preoperative instructions.

The most common reasons for same day cancellations in adult and pediatric patients are due to missed preoperative preparations and patient no-shows (Xue et al., 2013). Cancellations due to NPO (nil per os or nothing by mouth) violations, missed preoperative instructions, and patient illness may be reduced with effective communication between the patient's parents or guardians and hospital personnel. Communication between patient and healthcare provider is an important element in patient satisfaction, patient centered care, and prevention of cancellations (Antoun, 2016; Allison & George, 2014). Patients and their families often have difficulty recalling verbal preoperative instructions. Vetter, Downing, Vanlandingham, Noles, and Boudreaux (2014) demonstrated the effectiveness of written preoperative instructions over verbal instructions in adult surgical patients. Several studies have noted the effectiveness of email

communication; however, email communication is not frequently used in healthcare communication (Mazurenko, Hearld, & Menachemi, 2017; Gordon et al., 2015; Newhouse, Lupianez-Villanueva, Codognone, & Atherton, 2015; Atherton, Sawmynaden, Sheikh, Majeed, & Car, 2012). Clinical advantages of email communication include: efficiency, cost effectiveness, can be sent outside of traditional office hours, can be archived in separate folders in the email, can be retrieved to access otherwise missed communication, and facilitates communication between healthcare professionals and patients (Goyder, Atherton, Car, Heneghan, & Car, 2015).

A review of same day cancellations at a large tertiary pediatric facility in North Texas from 1/1/2017 to 8/31/2017 revealed that 22% of scheduled cases were cancelled on the day of surgery. The case cancellations in this facility were due to NPO violations, lack of adherence to preoperative instructions, patient illness, no-shows for surgical appointments, surgeon cancellations, parents seeking second opinions, unexpected new trauma cases, and surgeon illnesses. This quality improvement project evaluated the effectiveness of emailed preoperative instructions in decreasing same day cancellations due to NPO violations, patient illness, missed preoperative instructions, and no-shows on the day of surgery.

Literature Review

Same day Surgery Cancellation

Though same day surgery cancellations are more common in pediatrics than in adults, few articles describe this problem (Pratap et al., 2015). Among the articles reviewed on the topic of same day cancellations, there were only two articles that discussed pediatric surgery cancellations. Pohlman, Staulcup, Masterson, and Vermulakonda (2012) examined the reasons for same day cancellations in scheduled outpatient pediatric urology procedures. The

investigators conducted a retrospective chart review for 7 months. Results demonstrated 13% of scheduled outpatient surgical cases were cancelled due to patient illness, finance/insurance, NPO violations, weather/traffic, and other non-specific reasons. The most common reason for cancellation was patient illness, especially upper respiratory illness (40%). To prevent the facility's financial loss and improve operating room efficiency, the investigators suggested parental education of preoperative instructions.

Pratap et al. (2015) conducted a quality improvement project to improve OR efficiency and address pediatric surgery cancellations due patient illness, no-shows, and NPO violations. It was noted surgery cancellations due to NPO violations were related to families' confusion with NPO instructions, no-shows were related to families not being informed of surgery time when the surgery was scheduled, and patient illness cancellations were due to parents not understanding the significance of patient illness in relation to general anesthesia. To promote adherence to preoperative instructions and decrease cancellations, the quality improvement project focused on family education. Investigators developed a single page "Steps to Surgery" sheet that focused on NPO guidelines based on patient age and developed a software program to send parents/guardians text message via "Short Message Service (SMS)" informing them of NPO and arrival instructions. The results of this project noted an increase in hospital revenue and improved patient and family experience. The investigators did not mention if the intervention decreased same day cancellations. Like Pohlman et al. (2012), the investigators indicated preventing same day cancellation will increase hospital revenue and operating room efficiency. Clear preoperative instructions will also improve parent/guardian satisfaction.

Electronic communication

Two of the reviewed studies addressed caregiver or parent/guardian response to electronic communication. A survey by Weems, Graetz, Lan, DeBaer, and Beeman (2016) evaluated caregiver response to electronic communication. This study reviewed the usefulness of electronic communication in improving provider-parent communication and decreasing parental stress. The investigators surveyed 217 parents/guardians whose children were admitted to the neonatal intensive care unit (NICU) over a three-month period. They surveyed parental computer use, mobile connectivity, interest in receiving updates about their child via email, phone call, or online portal, infant's overall health, parental age, race/ethnicity, education, income, and work status. Results indicated 79% of respondents had smart phones, 85% had unlimited texting capability, and 30% owned internet capable devices. In addition, 79% had looked up medical information online, 65% reported electronic messaging helped them be connected with their infants, and 80% reported electronic communication enhanced their understanding to better care for their infant. Most parents in this survey preferred text message communication over emails and online health portals. Survey results indicated that health-care providers were cautious in using text message and online communication to discuss health related matters with their patients as it does not meet standards set by Health Insurance Portability and Accountability Act (HIPAA). The investigators noted that secure mobile healthcare portals that meet HIPAA standards of online communications are available. The use of such communication is potentially powerful for communicating with and educating NICU parents.

Dudas and Crocetti (2013) evaluated parent/guardian access and attitude toward online communication using a cross sectional design. The investigators surveyed 229 English speaking

caregivers with children from birth to 21 years in an urban primary care pediatric clinic. Data indicated over 86% of respondents preferred email correspondence with their child's healthcare provider to discuss common pediatric concerns (e.g., cold symptoms, sleep issues, and weight concerns) over discussing laboratory results and behavioral and developmental concerns. Although a large number of respondents preferred email to communicate with their child's health care provider, only 11% used this method of communication. Investigators also reported caregivers with higher education, higher income, and commercial insurance were more likely to use email to communicate with their child's provider than African Americans and those from lower socioeconomic status. The investigators urged health-care providers to be cognizant of potential healthcare disparities due to racial/ethnic difference and socioeconomic status when using email and mobile communication in pediatrics.

Electronic communication in the surgical area.

Gordon et al. (2015) conducted a two-year multicenter study with adults undergoing elective surgical procedures to evaluate the benefit of electronic communication preoperatively. The 313 study participants completed an online registration that provided a digital platform to send and receive messages from the healthcare team. At enrollment, participants identified family members and/or friends who had permission to access communication when the participant was in the intraoperative and post anesthesia phase. Surgeons and health care team members communicated with the participant and the participant-selected individuals by instant messaging (IM), SMS, text, or email through a secure server. The majority of respondents (patients, patient selected individuals, surgeons, and other health care team members) reported satisfaction in using the digital software. The study concluded that effective communication between patients and the healthcare team members are crucial in patient satisfaction. The

implementation of digital communication using a secure network yielded a high level of patient satisfaction.

Email communication

Email communication is a method of written electronic communication. Email communication can be documented within the electronic medical record and serves as a point of reference for both patients and caregivers. Newhouse et al. (2015) compared the effectiveness of asynchronous communication (email communication) to synchronous communication (telephone communication) between healthcare professionals about their patients and between healthcare professionals and patients. The investigators collected data from 14 European countries using an online survey. Results demonstrated more men used email communication than women for healthcare concerns and those with poor or worsening health used email communication with their health-care provider. In addition, college educated participants between 16-24 years of age and current students used email more than older participants without college education. The investigators concluded email communication is a valuable tool in health communication between healthcare professionals and patients.

Fage-Butler and Jensen (2015) evaluated positives and negatives of email communication from the patient's perspective. The authors conducted an integrative literature review of 29 peer reviewed empirical and theoretical articles of international significance from 2004 to 2014. Positive aspects of email communication included flexibility of communication outside regular office hours and addressed patient concerns not adequately taken care of during office visits. Email also enabled patients to directly converse with their provider, improved continuity of care for patients with chronic complex histories, and provided patients greater access to their provider. Finally, email communication promoted patient education as the email can be used as

a written treatment plan. Despite the positives of email communication from the patient perspective, providers wanted more evidence on how email communication affects legal and ethical issues, billing and reimbursement, and the impact of email on provider work-load. Disadvantages of email communication included concerns regarding breach of patient confidentiality, legal and ethical concerns, and the delayed response from patient or provider due to the asynchronous nature of email communication.

Privacy concerns.

Mazurenko et al. (2017), studied the relationship of Health Information Technology (HIT) and physician email communication since the passage of the Health Information Technology for Economic and Clinical Health (HITECH) Act to determine the potential effect of the Act on email communication with providers and patients. Following the passage of the HITECH Act, policy makers have encouraged the use of HIT to improve healthcare communication. Results demonstrated less than 5% percent of physicians spend more than 30 minutes emailing patients, and small physician practices (e.g. one or two provider practices) were less likely to use email as a method of communication between providers when compared to a larger practice (e.g. hospital-based practices). Reasons given by respondents for why email communication or online portals were not used by some practices related to malpractice concerns, financial costs of implementing HIT, lack of available resources, and the lack of need (some high-income communities have healthier patients). The investigators concluded communications using HIT are secure and compliant with privacy laws. They stated policy makers and advocates of HIT must consider partnering with targeted practices in providing educational benefits of online communication.

Email appointment reminders.

One study evaluated the feasibility of email appointment reminders in parents of pediatric patients (Dombkowski, Cowan, Costello, Fisher, & Clark, 2014). The study took place in three primary care sites (two pediatric practices and one family medicine practice). Parental email addresses were obtained and updated in patient files by office staff. Email messages with the practice name and logo were sent to parents through an email vendor over a six-month period to confirm email was an acceptable means of appointment reminder and to inform the family of the availability of the influenza vaccine. The messages did not have any patient identifying information and contained an opt-out option for those who did not prefer email reminders. During the study 3670 email reminders and 494 influenza vaccine reminders were sent via email. Overall, 18% of the messages sent were undeliverable and 3% of those who received the email opted not to receive email reminders. The study demonstrated the feasibility of using an email vendor to send appointment reminders. The investigators did not mention if email appointment reminders decreased the practices' no-show rates, and if influenza vaccine reminders increased practices' influenza vaccination rates.

Written Instructions

Medical information is often overwhelming and hard to understand. Lin, Tirosh, and Landry (2015), conducted a study to evaluate if medical staff can trust patient report of understanding emergency department discharge instructions. They conducted a prospective observational study in a tertiary medical center with 75 adult patients over 18 years of age. Patient understanding of discharge instructions was assessed with post-encounter surveys after the patient was discharged but before the patient left the emergency department. Patient understanding was grouped into four categories: clinical diagnosis, emergency department care,

post-discharge instruction, and reason to return to the emergency department. Results demonstrated that although patients verbalized their understanding of discharge instructions, they actually did not understand their instructions.

Written preoperative instructions.

Communication between patients and healthcare provider is important in improving patient satisfaction and health care. Vetter et al. (2014) estimated about 40 to 80% of medical information given to patients and their families is immediately forgotten. Reasons why patients and patient families fail to recall medical information presented to them include the use of medical terminology, the way information is presented (spoken vs. written), and patient and patient families' ability to comprehend medication information due to low education or preconceived notions.

During preoperative phone calls, families/guardians are given large amounts of verbal information and instructions. A quality improvement study by Vetter et al. (2014) evaluated the effectiveness of verbal and written preoperative medication instruction compliance in a preoperative setting compared to "unstandardized manner" or verbal only communication (p. 30). The control group/preintervention group received medication instructions either verbally, handwritten, or a hard copy of the patient's electronic medical record with medications highlighted by the anesthesiology residents or nurse practitioners. The intervention group received a medication instruction sheet that contained the list of medications the patient has to take on the day of procedure, the medications the patient should skip or not take on the day of surgery, and a list of medications the patient may take as needed on the day of procedure. Data demonstrated the written standardized medication instruction (intervention) increased medication compliance on the day of surgery. Patients who were compliant with pre-operative medications

had shorter post-operative anesthesia care unit stay (88 minutes) when compared to the control group (94 minutes). Although verbal preoperative instructions can be quickly communicated, specific written pre-operative instructions improved patient recall and compliance. The investigators stressed verbal and written or visual communication is optimal in increasing patient adherence.

In summary, the literature yielded studies that supported written patient instructions to improve patient adherence to treatment plan. It also confirmed electronic communication is easily accessed and improves patient-provider communication. The use of email preoperative instructions in a pediatric surgical population has not been explored.

Framework

The Plan-Do-Study-Act (PDSA) cycle is an evidenced based, action oriented, and planned quality improvement effort used to test and determine the impact of healthcare change. The steps of the PDSA cycle include; Plan – plan the test or observation, Do – try or test the change on a small scale, Study – analyze data and study what is learned, and Act – refine the change based on what is learned and repeat testing (U.S. Department of Health & Human Services, 2016; Melnyk & Fineout-Overholt, 2011). Using this model, teams develop an aim that can be tested in small-scale, and then it is replicated in rapid cycles based on measurements. Teams plan the change, implement the change, and take necessary action based on the results observed (White, Dudley-Brown, & Terhaar, 2016; Melnyk & Fineout-Overholt, 2011). If the result observed is not desired, teams go back to the starting point to review the problem (see Appendix A). The use of the PDSA cycle to implement email pre-operative instructions will enable the clinical team to plan, implement, analyze, and observe the impact of the change in decreasing same day surgery cancellations. If same day cancellations decrease with the addition

of email pre-operative instructions, knowledge attained can be used on a broader scale to sustain and maintain the change.

PICO

In pediatric patients undergoing general anesthesia, how does emailed preoperative instruction in addition to preoperative instructions by nurse phone call compare to only preoperative instructions by nurse phone call effect same day cancellations.

Objectives

- Determine reasons for same day cancellation.
- Decrease same day cancellations due to no shows, NPO violations, and recent illness.

Methods

Design

This quality improvement project with an intervention plan evaluated the effectiveness of emailed preoperative instructions along with telephone call communication to decrease same day case cancellations when compared to one-time telephone call communication of preoperative instructions.

Population/Setting

The quality improvement project was conducted at one of the largest pediatric facilities in North Texas. The facility offers tertiary and quaternary care in over 50 pediatric specialties. The Main O.R. is a surgical suite with 18 operating rooms, where approximately 25,000 surgical cases take place yearly. This quality improvement project used a nonprobability convenience sampling method. All English-speaking patient families with a child between 1 week to 18 years of age scheduled for an outpatient procedure by Neurosurgery, Plastics, Dental, and Urology in the MAIN O.R. were included in this project.

Measurement Methods

In this non-experimental convenience sampling study, retrospective and prospective data were gathered using the electronic medical record. Data obtained from the electronic medical record is presumed reliable and valid. Investigator reliability was supported by the use of a detailed data collection form. An excel spreadsheet was used to organize nominal data into specialty, date of surgery, phone call date, email sent, language (English, or Spanish), and cancellation/reason before and after the intervention.

The quality improvement project did not require institutional review board (IRB) approval. The University of Texas at Arlington categorized this project as a quality improvement project that did not satisfy the definition of research under 45CFR 46.102(d). Therefore, it was not subject to the Health and Human Services regulation for the protection of human subjects in research or require IRB approval (see Appendix B). The investigator initially planned to send text message reminders as a means of communication to decrease cancellations. However, due to privacy concerns the intervention was modified to send preoperative instructions by email. Prior to starting this project, facility approval was obtained from the Director of Quality and Patient Safety (see Appendix C and Appendix D).

Procedure

Pre-Intervention (Current practice).

Patient's parents/guardians receive pre-operative instructions two business days before their child's scheduled surgical procedure. Preoperative instructions are given via telephone call by preoperative staff nurses. At the time of the phone call, families are asked to write down recommendations and instructions for the day of the procedure. Preoperative instructions include location and date of surgery, arrival times, NPO times, medication recommendations,

and illness. When the nurses call families with pre-operative instructions, they inquire about the patient's recent illness, recent travel, and current medications. Diagnoses such as pneumonia, asthma exacerbation, respiratory syncytial virus infection, croup, and other contagious illness in the past 4 to 6 weeks, necessitate rescheduling the procedure. If parents/guardians report a patient history of recent illness, nurses contact the attending Anesthesiologist, preoperative Nurse Practitioners, or Physician Assistants for recommendations. If a procedure has to be rescheduled due to illness, the nurses inform the surgery schedulers of the recommendation after verification with one of the preoperative providers. The preoperative nurses are given standardized medication recommendations for patients on cardiac, asthma, psychotherapy, antiseizure, and endocrine medications. If patients are on medications out of the nurse's scope they contact a provider for medication recommendations. The nurses then convey the recommendations to the parents/guardians. Families with medically complex patients who are tracheostomy dependent, ventilator dependent, on home oxygen, have a gastrostomy tube for feeding, and on continuous positive airway pressure (CPAP) or on noninvasive ventilation for acute and impending respiratory failure are asked to bring home medical equipment on the day of procedure.

Intervention/Implementation plan.

The Pre-operative nurses called parents/guardians two business days prior to their child's or guardian's scheduled surgical procedure as in pre-intervention. At the time of the phone call, the nurses informed families they also have the option of receiving written preoperative instructions via email. If the parent/guardian chose to receive email instructions, the nurses obtained the parent's/guardian's email address and emailed the preoperative instructions. The preoperative email followed a standard template (Appendix E). The email template was

approved by the facility's ethics committee and HIPAA compliance officer. The email instructions were written at a seventh to eight grade readability level. The preoperative email included the following information: place and date of surgery, arrival times, NPO times, recent illness guidelines, medication recommendations, and what to bring on the day of the procedure. The preoperative nurses were educated on how to document the email addresses and the email sent messages in the patient's medical record. Reasons why parents/guardians did or did not receive preoperative instruction via email was also documented in the patient's chart. A separate email inbox was created and approved for use by information technology staff. All preoperative nurses had simultaneous access to the email inbox that was used to send preoperative instructions.

This quality improvement project was implemented in a small-scale in outpatient cases scheduled by Neurosurgery, Urology, Plastics, and Dental. The preoperative staff offered parents/guardians of patients scheduled for an outpatient Neurosurgery, Plastics, Urology, and Dental procedure the option of receiving emailed preoperative instructions along with phone call preoperative instructions two business days prior to the surgery. This project was implemented with specialties that seldom change operating room sequence to ensure parents/guardians were not receiving multiple emails with different arrival and NPO times as this can misrepresent data collection.

Data Collection/Analysis

The preoperative nurses making the phone call documented the phone call communication of preoperative instructions in the electronic medical record under the phone call tab for the surgery encounter. The investigator obtained the preoperative phone call data from the electronic medical record. Retrospective data for Neurosurgery, Plastics, Urology, and Dental

specialties were collected from 6/12/2017 to 9/15/2017 (pre-intervention). Intervention was implemented and post-intervention data was collected from 10/15/2017 to 1/12/2018. Data collected was entered into an excel spreadsheet. Data included date of procedure, surgical service and cancellation reason. In the post-intervention phase, the intervention (email and preoperative phone call) and parent primary language was added to the data collection spreadsheet. The overall observations (pre-intervention and post-intervention data) were plotted on a bar graph to visualize the effect of email pre-operative instructions in same day cancellations (see Appendix F).

The chi-square test was obtained using SPSS to measure statistical significance of email instruction on same day cancellations. The p-values for all the groups observed (overall, Neurosurgery, Plastics, Urology, and Dental) was greater than 0.05 (see Appendix G). Based on the chi-square test, the null hypothesis was rejected, that is, there is a decrease in same day cancellations using preoperative email instructions when compared to before the intervention.

The Mann-Whitney U test was also obtained using SPSS on all the observations to analyze cancellations before and after the intervention (see Appendices H-1 to H-5).

Results

Retrospective data was reviewed to evaluate the percent of cases cancelled on the day of procedure/surgery. Data obtained from 1/1/2017 to 8/31/2017 demonstrated overall 22% of scheduled inpatient and outpatient cases were cancelled on the day of procedure. The intervention plan was outlined for outpatient cases scheduled by Neurosurgery, Plastics, Urology, and Dental. The pre-intervention data was collected from 6/12/2017 to 9/15/2017. In the pre-intervention phase Neurosurgery, Plastics, Urology, and Dental specialties scheduled a total of 1,155 outpatient cases. Out of the 1,155 cases 47 cases (4%) were cancelled on the day

of procedure. Data showed 3% of Neurosurgery cases, 4% of Plastics cases, 5% of Urology cases, and 4% of Dental cases were cancelled on the day of procedure (see Table 1).

The intervention, emailed preoperative intervention, was implemented from 10/15/2017 onwards. Post-intervention data was collected from 10/15/2017 to 1/12/2018. In the post-intervention phase a total of 658 outpatient cases were scheduled by Neurosurgery, Plastics, Urology, and Dental. Out of the 658 scheduled cases 32 (5%) were cancelled on the day of procedure. Post-intervention data collection demonstrated 6% of Neurosurgery cases, 3% of Plastics cases, 4% of Urology cases, and 5% of Dental cases were cancelled on the day of procedure (see Table 1).

Table 1

Pre-Intervention and Post-Intervention Observations

Service	Scheduled in Pre-Intervention	Cancelled in Pre-Intervention	Scheduled in Post-Intervention	Cancelled in Post-intervention
Neurosurgery	231	3% (N = 7)	88	6% (N =5)
Plastics	245	4% (N = 9)	119	3% (N = 4)
Urology	289	5% (N =14)	157	4% (N = 6)
Dental	390	4% (N = 17)	294	6% (N = 17)
Totals	1,155	4% (N = 47)	658	5% (N = 32)

During the pre and post intervention phases, the investigator recorded reasons for same day cancellations (see Table 2). In the post-intervention phase, the investigator documented the number of patient families who received the intervention and cancellation reasons for each of the four services (see Appendix I).

Table 2

Reasons for Case Cancellation Pre and Post Intervention

Reasons	Pre-Intervention (N = 47)	Post-Intervention Phase (N = 32)
Patient Illness	23% (11)	59% (19)
NPO violation	9% (4)	22% (7)
No-show	19% (9)	6% (2)
Surgeon cancelled	13% (6)	6% (2)
Other (pending medical and financial clearance, transportation, family refused, and family did not bring asked equipment)	36% (17)	6% (2)

Out of the 88 scheduled outpatient Neurosurgery procedures in MAIN OR, 63% of patient families received email preoperative instructions, 19% were not offered email instructions, and 2% reported not having an email address (see Appendix I).

Out of 119 scheduled outpatient Plastics procedures in the MAIN OR, 47% of patient families received email preoperative instructions, 43% were not offered email instructions, and 0.8% reported not having an email address (see Appendix I).

Out of 157 scheduled outpatient Urology procedures in the MAIN OR, 58% of patient families received email preoperative instructions, 25% were not offered email instructions, and 2% reported not having an email address (see Appendix I).

Out of 294 scheduled outpatient Dental procedures in the MAIN OR, 53% of patient families received email preoperative instructions, 31% were not offered email instructions, and 1% reported not having an email address (see Appendix I).

Data obtained during the post-intervention period noted only 55% (359 out of 658) of patient families were offered emailed preoperative instructions. Overall, 30% of patient families were not offered the email option. The majority of the families not offered the email option were Spanish speaking, 7% declined emailed preoperative instructions, and 2% did not have an email address (see Table 3).

Table 3

Email Preoperative Instructions Implementation

Services	Email sent	Email not offered (Email not sent)	Spanish (Email not offered)	Email declined	No Email address	Preoperative staff unable to contact (families obtained times from surgery schedulers)
Neurosurgery (N =88)	55	8	9	10	2	4
Plastics (N = 119)	56	19	32	3	1	8
Urology (N = 157)	91	18	22	12	3	11
Dental (N = 294)	157	30	61	21	4	21
Total (N = 658)	359 (55%)	75 (11%)	124 (19%)	46 (7%)	10 (2%)	44 (7%)

The quality improvement project was initiated to decrease overall same day cancellations due to patient illness, NPO violations, and patient no-shows. Overall, pre-intervention data demonstrated 23% of cases were cancelled due to patient illness, 9% due to NPO violations, and 19% due to no-shows. In the post-intervention phase, data demonstrated 59% of cases were

cancelled due to patient illness, 22% due to NPO violations, and 6% due to no-shows (see Table 2). There was an increase in case cancellations due to patient illness and NPO violations in the post-intervention phase. Results revealed 18 out the 32 total cases cancelled (56%) received email instruction while 14 (44%) out the total cancellations in the post-intervention phase did not receive preoperative instructions via email (see Appendix I).

Discussion

There was a difference in the number of cases scheduled in the pre and post intervention phases of this project, with more outpatient cases scheduled during pre-intervention than during post-intervention. In pediatrics this variation is most likely because outpatient elective procedures are scheduled around school holidays, and more procedures are scheduled during summer holidays than winter holidays. In the pre-intervention phase there were 1,155 scheduled and 658 scheduled cases in the post-intervention phase. Since there is a difference in the number of cases scheduled (pre and post intervention) it appears there was a higher percentage of cancellations in the post-intervention phase (5%) when compared to pre-intervention data (4%).

Post-intervention data demonstrated overall 55% of patient families were offered preoperative emailed instructions, 7% of families declined emailed preoperative instructions, 2% of families reported not having an email address, and 7% of families did not receive preoperative instructions by the preoperative nurses (arrival and NPO instructions were given by the surgeon's scheduler due to scheduling issues). Nineteen percent of the families were Spanish speaking and not offered email instruction. In addition to Spanish speaking parents/guardians, 11% of families were not offered emailed preoperative instructions. Therefore, it is difficult to fully evaluate the potential impact of emailed preoperative instructions on same day cancellations.

This project was initiated to decrease same day cancellations due to patient illnesses, NPO violations, and no-shows. In evaluating the overall reasons for cancellations (pre and post-intervention) data demonstrated a decrease in same day cancellations related to no-shows, and an increase in same day cancellations due to patient illnesses and NPO violations in the post-intervention phase. The decrease in same day cancellations due to no-shows in the post-intervention phase is likely related to patient families having access to written retrievable preoperative instructions. When parents/guardians receive the preoperative phone call two business day prior to their child's scheduled procedure, they might be engaged with other parental responsibilities. Parents/guardians might write down the time and the address on a scratch paper that might be misplaced on the day of procedure. Emailed preoperative instructions provide families with written arrival times and facility address that parents/guardians can easily access on the day of procedure.

The increase in patient illnesses in the post-intervention phase is most likely due to seasonal variations. As noted previously, in pediatrics elective outpatient procedures are scheduled around school holidays. More procedures are scheduled around summer holidays than winter holidays. The pre-intervention data was collected in the Summer when children are usually healthier and less likely to be cancelled due to illnesses. Hence, the larger sample size and the fewer patient illness related same day cancellations in the pre-intervention phase. In pediatrics, October to April is when most children catch common childhood illnesses including upper respiratory infections, croup, respiratory syncytial virus, influenza, and other respiratory illness. The post-intervention data was collected in the Fall/Winter timeframe when more children are ill with respiratory viruses which is likely the reason for the overall smaller sample size and higher patient illnesses related same day cancellations.

There was an increase in case cancellations due to NPO violations in the post-intervention phase. Overall, among patient families who received emailed preoperative instructions there were 2 (6%) same day cancellations compared to 5 (17%) same day cancellations among families who did not receive emailed preoperative instructions. It can be inferred if a higher percentage of patient families received emailed preoperative instructions, same day cancellations related to NPO violations may have been lower.

Although all preoperative nurses were educated regarding the importance of offering emailed preoperative instructions to all English-speaking families, it was cited by the preoperative nurses that offering email instructions to all English-speaking families was a change that interfered with their daily work. In addition, the nurses indicated that sending the email increased their workload and thus was not consistently offered to parents/guardians.

The chi-square test showed there was no significant statistical difference in same day cancellation before and after the intervention. However, the median number of cases cancelled per week after the intervention was measurably lower and at the center of distribution across the entire observation (6/12/2017 to 9/15/2017 + 10/15/2017 to 1/12/2018). Statistical significance was not observed primarily due to the small sample size. The lack of statistical significance does not reflect clinical significance of emailed instructions because the threshold of clinical significance is below the orders of magnitude of what statistical significance is capable of measuring.

The Mann-Whitney for the combined observations (Neurosurgery, Plastics, Urology, and Dental) showed statistical significance (90% Confidence interval) and same day cancellations were overall less in the post- intervention phase when compared to the pre- intervention (see Appendix H). When individual services were reviewed, although not statistically significant,

there were measurable differences in case cancellations. There was a difference in case cancellations after the intervention with the exception of the Dental service.

Limitations

There were several limitations to this quality improvement project. The results of this non-experimental convenience sampling project are not generalizable to all same day pediatric surgery cancellations. In addition, results were obtained from a single center, thus limiting generalizability of results. A multi-center study with a larger sample size is necessary to measure the effect of emailed preoperative instructions on same day cancellations.

Patient illness was another limitation to this project. Most not-emergent scheduled procedures in pediatrics are scheduled between the end of May to beginning of October, correlating with school closings and parent/guardian vacations. Outpatient non-emergent procedures scheduled during Fall and Winter have a higher chance of cancellations due to patient illnesses including upper respiratory illness and influenza. This project was limited to same day cancellations over a 26-week period (13 weeks, pre-intervention and 13 weeks, post-intervention). Pre-intervention data was collected in the Summer when children are normally healthier than in the post-intervention phase (Fall/Winter) when children are prone to catching childhood illnesses. Since seasonal variations were not considered, the sample size was smaller in the post-intervention phase and there was a higher percentage of same day cancellations due to patient illnesses.

Finally, not all English-speaking patient families who had a child scheduled for a procedure by Neurosurgery, Plastics, Urology, and Dental received emailed preoperative instructions. Organizational and departmental practice and culture changes are often difficult and

stressful for staff. Though change is difficult, small strides toward quality improvement can be made using the steps of the PDSA cycle.

Recommendations

This quality improvement project has potential to decrease same day cancellations in pediatric surgery centers. Some suggestions to improve this project for generalizability are extending this intervention (emailing preoperative instructions) for at least two years to account for seasonal variations. Replicating this project intervention in multiple pediatric surgery centers across a state or the country for at least two years will yield results that may be statistically as well as clinically significant and generalizable.

Due to language barriers, Spanish speaking families were excluded in this project. Translating the emailed preoperative instructions to Spanish and including Spanish speaking families in a similar quality improvement project should be implemented and investigated.

To improve workflow, when scheduling a procedure, the surgery schedulers could obtain and document parent's/guardian's email address in the patient's electronic medical record. Then the schedulers could email families a general preoperative instruction sheet that families can review before the preoperative nurse phone call two business day before the scheduled procedure.

Conclusion

Email is a prevalent means of communication in today's society. It is used in the healthcare setting as reminders to decrease no-show rates, address patient concerns and questions, to follow up after hospital admission, and recall medical communication provided to families during a consultation. Emailing pre-operative instructions to parents/guardians who also receive the preoperative phone call instructions enhances healthcare communication. It is

especially useful for parents/guardians who are often distracted caring for young children while speaking on the phone. Email provides family/guardians with a retrievable reference in case they forget their child's surgery date, time, address, illness guidelines, and NPO guidelines. In today's world of advanced technology and smart phones, email is easily accessible on smart phones and other mobile devices unlike a paper copy that can be misplaced. This project demonstrated email preoperative instructions has clinical significance in decreasing pediatric same day cancellations.

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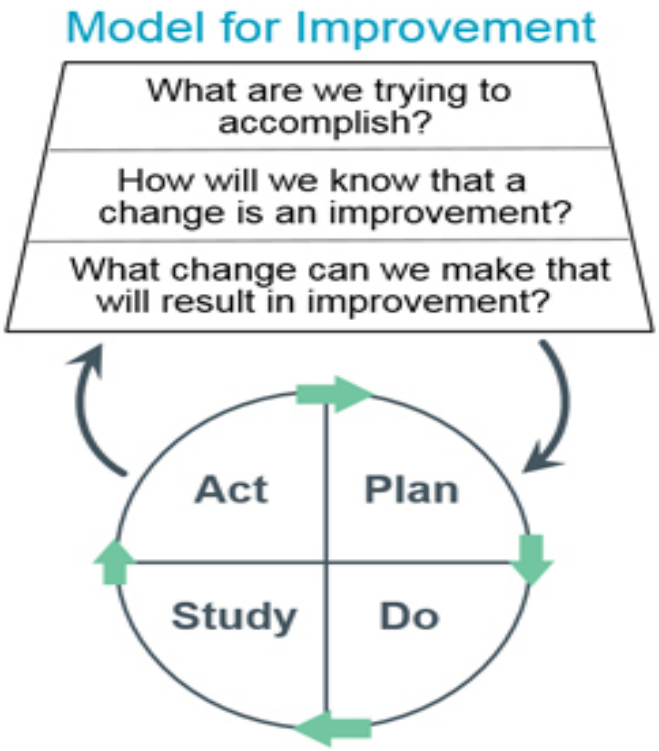
APPENDICES

Appendix A

Model for Improvement: Plan – Do – Study – Act (PDSA) Cycle



Appendix B

University of Texas at Arlington approval

DNP Project Approval Template for the Graduate Nursing Department Review Committee

Student completes the top portion only
Student ID number: 1000117006

Project Title: Text-messaging Preoperative Communication

Project Summary (Brief):

Surgical cancellations on the day of procedure is associated with poor quality of care, lower patient satisfaction scores, and higher healthcare costs (Singhal, Warburton, & Charalambous, 2014; Haufler & Harrington, 2011b For patients, same day cancellation can result in emotional distress, missed working days, possible worsening of symptoms, and lengthy admissions (Schuster et al., 2011). For health care facilities, case cancellation can lead to loss of fixed operating room (OR) revenue, decreased patient satisfaction scores, and decreased quality of care (Xue, Yan, Barnett, Fleisher, & Liu, 2013; Schuster et al., 2011). Same day cancellations are often a result of missed appointment or no-shows, NPO (nothing by mouth) violations, and missed preoperative instructions. Several studies have noted, clear concise NPO instructions and pre-op medications recommendations have decreased OR cancellations (Renew, Irizary Alvarado, & De Ruyter, 2015; Haufler & Harrington, 2011, Xue et al., 2011). This quality improvement project will evaluate the effectiveness of text message preoperative communication along with telephone communication in decreasing same day case cancellations when compared to telephone preoperative instructions.

Setting: This project will take place in a large pediatric facility.

Population:

All English-speaking patient families with a child (newborn to 18 years of age) scheduled for an outpatient procedure in the main hospital operating room will be included in this study.

Committee Use Only

The results will be disseminated, but they are not generalizable knowledge. The results will include use of the most current researgh to translate the knowledge into practice, thus it is not new generalizable knowledge. Agree

This project is a quality improvement ✓ or evidence-based _____

project and will translate the knowledge into the clinical setting. It is not generalizable because it is not generated from a research study that is being conducted.

dyes No This project is not considered Human Subjects Research and does not require IRB HSR review.

This quality improvement project did not satisfy the definition of research under 45 CFR 46.102(d). Therefore, it was not subject to the Health and Human Services regulations for the protection of human subjects in research (45 CFR part 46, 2009) or require Institutional Review Board approval.

I recommend approval of this QI project

— Recommend Plan-Do-Study-Act Framework

___ I recommend approval of this EBP project or

I do not recommend approval of this project for the following:

I recommend the student send this project to the University IRB for review

Reason:

I do not recommend this project to be implemented____

Reason:

Committee Member Signature

5/12/2017

Date

Appendix C

Project summary submitted to facility's Director of Quality and Patient safety

Project title: Pre-operative text message reminders to decrease operating room cancellations on the day of surgery.

Modified Title: Effectiveness of email pre-operative instructions to decrease same day surgery cancellations

Problem Statement: Same day cancellations are often the result of patient families' missing scheduled surgery appointments, NPO (nothing by mouth) violations, and patient illnesses on the day of procedure. Same day cancellations may be decreased by text message reminders two days prior to the standard, nurse pre-op phone calls two days prior to scheduled procedure.

Modified Problem Statement: Same day cancellations are often the result of patient families' missing scheduled surgery appointments, NPO (nothing by mouth) violations, and patient illnesses on the day of procedure. Same day cancellations may be decreased by the use email pre-operative instructions along with the standard, nurse pre-op phone call two days prior to scheduled procedure.

Project Team:

Executive sponsor: Dr. Brian Kravitz

Physician champion: Dr. Jami Eidem Miller

Nursing champion: Leslie Whitefield, Michelle Matthews, Melvina Sutton, Terri Rothchild, Christina Garcia

Project manager: Suji John

Project SMART AIM (S):

Use of Plan Do Study Act (PDSA model) to evaluate reasons for same day surgery cancellations and implement text message reminders to decrease same day operating room cancellations.

Modified: Use of Plan Do Study Act (PDSA model) to evaluate reasons for same day surgery cancellations and implement email pre-op instructions to decrease same day surgery cancellations.

-Project Timelines:

Project Task	Project due date
Get quality approval	9/18/17
Meeting with Leslie and Lori Strolla	9/29/17
Conference call with pre-op nurses, pre-op nurse manager, and IT representative implementing project	9/19
Meeting with Dr. Miller, Dr. Kravitz, and Johanna	9/2917
Implementation of project (email pre-operative instruction)	9/29/17
Data gathering from January 1, 2017 to August 31, 2017	10/2/17

Data after implementation September 18, 2017 to end of Feb 2018	4/2018
Final paper	4/2018

Metrics:

- Use of frequency distribution table and histogram to demonstrate how email pre-op reminders decreased operating room cancellations.
- Use of SPSS to analyze data.
- Use of descriptive statistics (NPO violation, Illness, and No Show) to determine reasons for same day cancellations.

Use of non-parametric test, chi-square to analyze if email pre-op reminders made a difference in decreasing same day operating room cancellations.

Appendix D

Facility's Approval for the project

From: Tracy B. Chamblee
Senior Director, Quality and Patient Safety

Date: October 3, 2017

Graduate Student Quality Improvement (QI) Initiative

Student: Suji John

Modification Approval #17090601-1

The modifications to your initiative originally titled, Pre-operative text message reminders to decrease operating room cancellations on the day of surgery have been reviewed and approved for implementation at Children's Health, Children's Medical Center Dallas. This approval is contingent upon compliance with Children's Medical Center (CMC) institutional policies and procedures.

If there are any additional planned changes to the project as outlined in the proposal or the modification letter, please notify the Quality and Patient Safety Department prior to implementation as the changes may require additional review,

If you have any questions related to the approval of this project, CMC institutional policies and procedures, or QI compliance requirements, please contact me at (214) 456-7495 or via email, tracv.chamblee@childrens.com.

I wish you all the best in the conduct of your project and thank you for your ongoing efforts to "make life better for children."

Please retain copies of all correspondence related to this initiative for your records.

Sincerely,

Tracy B. Chamblee, PhD, APRN, PCNS-BC, cpps

Appendix E

Preoperative Email Instruction Template

Dear Parent or Guardian,

Your child is scheduled for surgery at Children's Health. A parent or legal guardian must be present on the day of surgery. If you are not the parent, please bring all paper work stating you are the child's legal guardian. Please bring your photo ID and insurance/Medicaid information on the day of surgery.

PROCEDURE DATE: **Monday, September 18, 2017**

ARRIVAL TIME: **9:15 a.m.**

ADDRESS: Children's Health
1935 Medical District Drive, Dallas, TX, 75235

PHONE NUMBER: Surgeon's office

EATING/DRINKING INSTRUCTIONS:

- Your child may eat and drink as usual on **Sunday** until midnight. After midnight, your child can **only** have water, Gatorade, or Pedialyte that is yellow, orange, or clear until **6:45 a.m. Monday** morning. After **6:45 a.m.**, your child **cannot** have anything in their mouth.
- Do not brush your child's teeth after midnight, the night before surgery.
- Your child cannot have candy or chew gum after midnight, the night before surgery.

ILLNESS:

- Tell the surgeon's office if your child is sick with cough, runny nose, congestion, fever, vomiting/diarrhea, has any rashes, and / or was seen by a doctor for any illness. The surgery may be cancelled, if your child is sick on the day of surgery.
- *Your Anesthesiologist is the only person who can clear your child for surgery.*

MEDICATION:

- Give your child all his/her breathing treatments or inhaled medicines (as needed and scheduled) the night before and morning of surgery.
- Give your child all his/her morning doses of seizure medicines with last clear liquid on the day of surgery.

MEDICAL EQUIPMENT:

- Bring all your child's home tracheostomy and ventilator supplies. This includes your child's current trach size, spare trach, home pulse oximetry, home oxygen, and home suction.
- Bring home CPAP/ BIPAP

- Bring all G-tube supplies. This includes your child's home machine, feeding bag, tubes, and connectors.

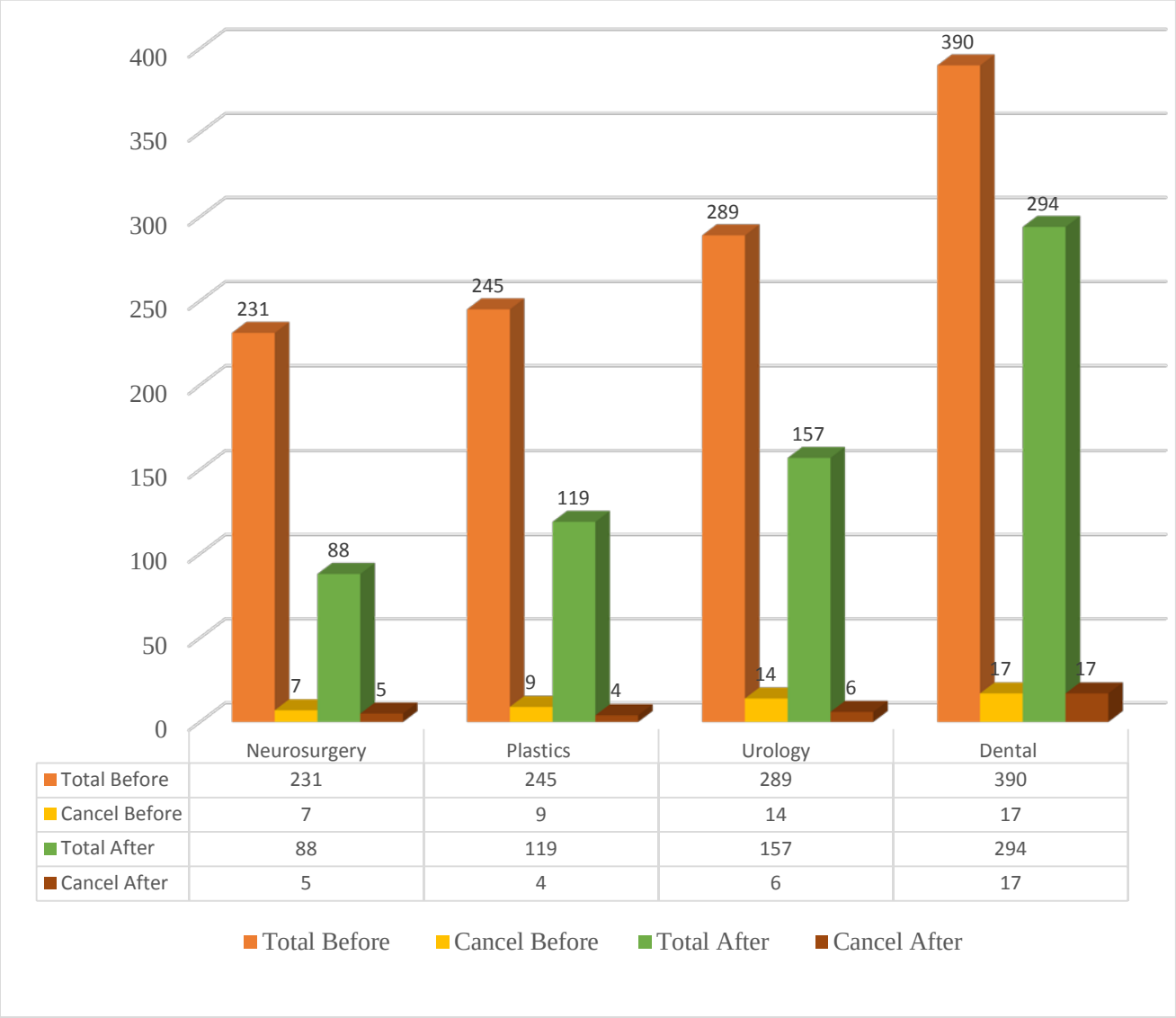
ADDITIONAL INFORMATION:

- Dress your child for comfort. Take off all jewelry, temporary tattoos, and stickers from your child's body.
- Bring your child's favorite pillow or blanket for the car ride home.

Bring your child's favorite bottle or sippy cup for the car ride home.

Appendix F

Total Observations (6/12/17 - 9/15/17 + 10/15/2017 - 1/12/18)



	Neurosurgery	Plastics	Urology	Dental
Total Before	231	245	289	390
Cancel Before	7	9	14	17
Total After	88	119	157	294
Cancel After	5	4	6	17

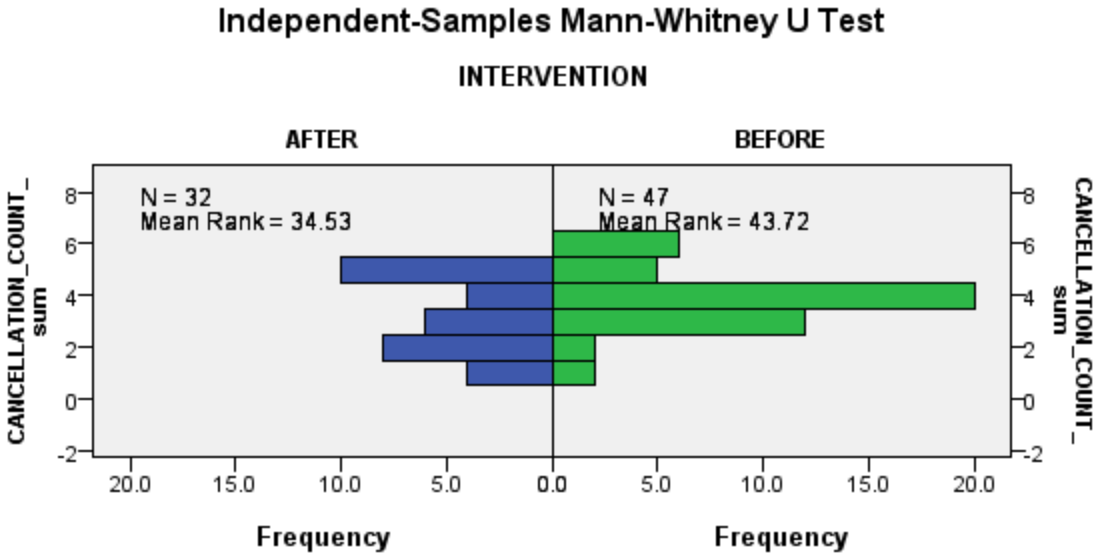
Appendix G

Chi-square test for the observations (pre-intervention and post-intervention)

Service	Scheduled (pre-intervention)	Cancelled (pre-intervention)	Total (pre-intervention)	Scheduled (post-intervention)	Cancelled (post-intervention)	Total (post-intervention)	p-value
Neurosurgery	231	7	224	88	5	83	1.192
Plastics	245	9	236	119	4	115	0.23
Urology	289	14	275	157	6	151	0.248
Dental	390	17	373	294	17	277	0.719
Total	1,115	47	1,108	658	32	626	0.623

Appendix H-1

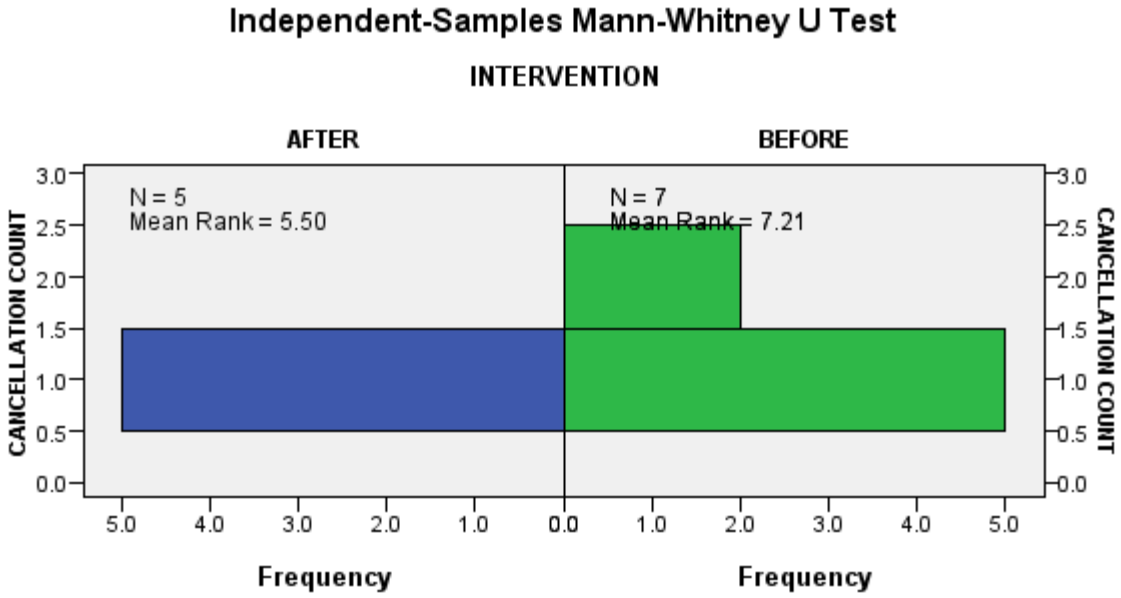
Mann-Whitney U Analysis – All Observations



Total N	79
Mann-Whitney U	577.000
Wilcoxon W	1,105.000
Test Statistic	577.000
Standard Error	97.625
Standardized Test Statistic	-1.793
Asymptotic Sig. (2-sided test)	.073

Appendix H-2

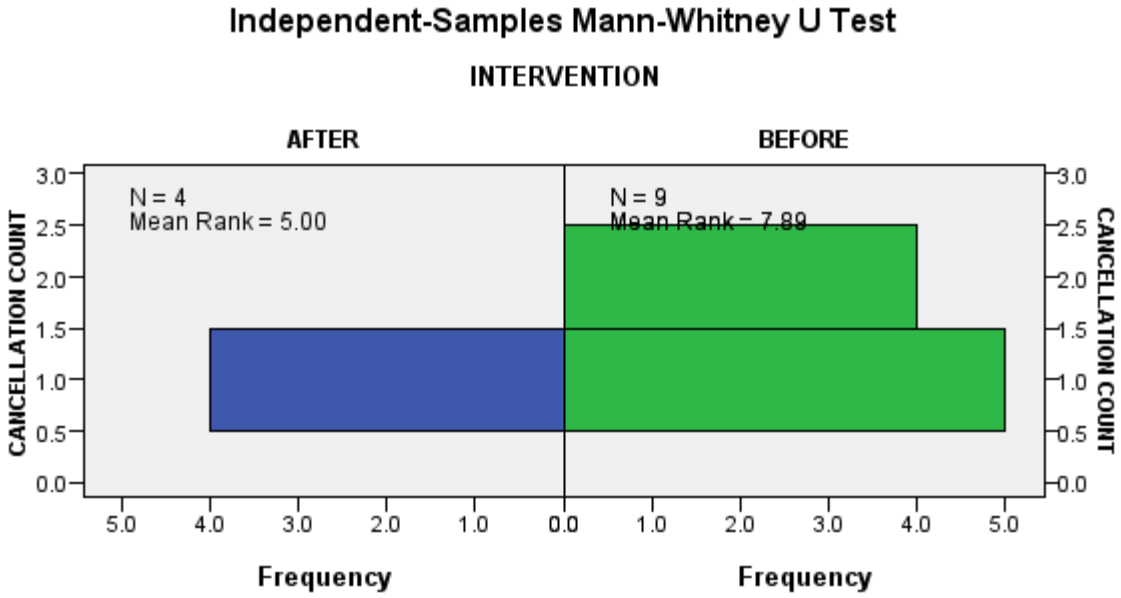
Mann-Whitney U Analysis of Neurosurgery cases Pre and Post-Intervention



Total N	12
Mann-Whitney U	12.500
Wilcoxon W	27.500
Test Statistic	12.500
Standard Error	3.989
Standardized Test Statistic	-1.254
Asymptotic Sig. (2-sided test)	.210
Exact Sig. (2-sided test)	.432

Appendix H-3

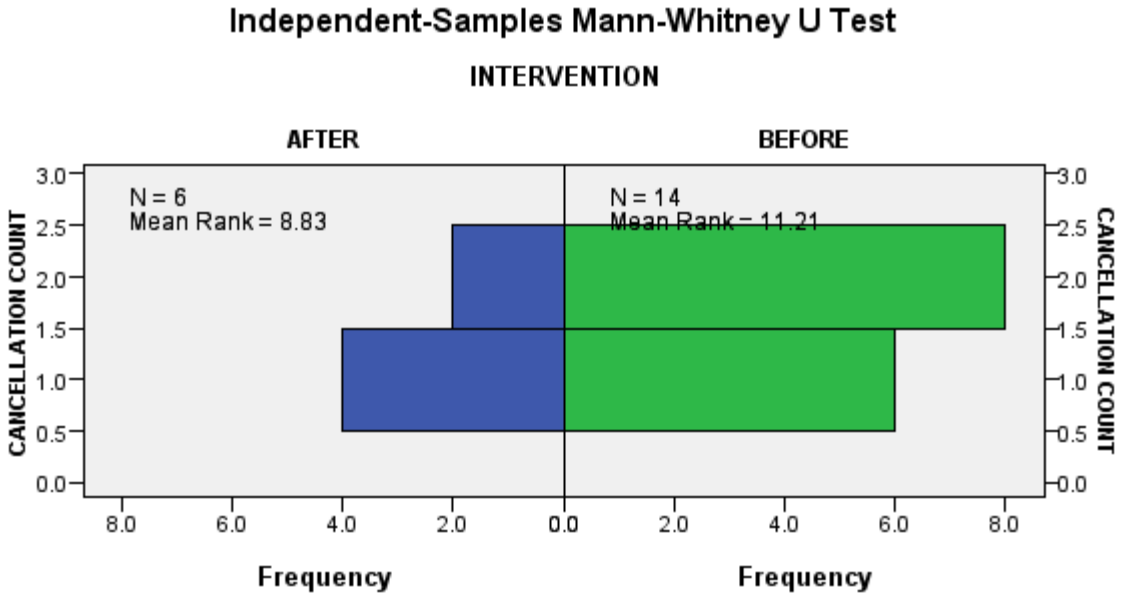
Mann-Whitney U Analysis of Plastics cases Pre and Post-Intervention



Total N	13
Mann-Whitney U	10.000
Wilcoxon W	20.000
Test Statistic	10.000
Standard Error	5.196
Standardized Test Statistic	-1.540
Asymptotic Sig. (2-sided test)	.124
Exact Sig. (2-sided test)	.260

Appendix H-4

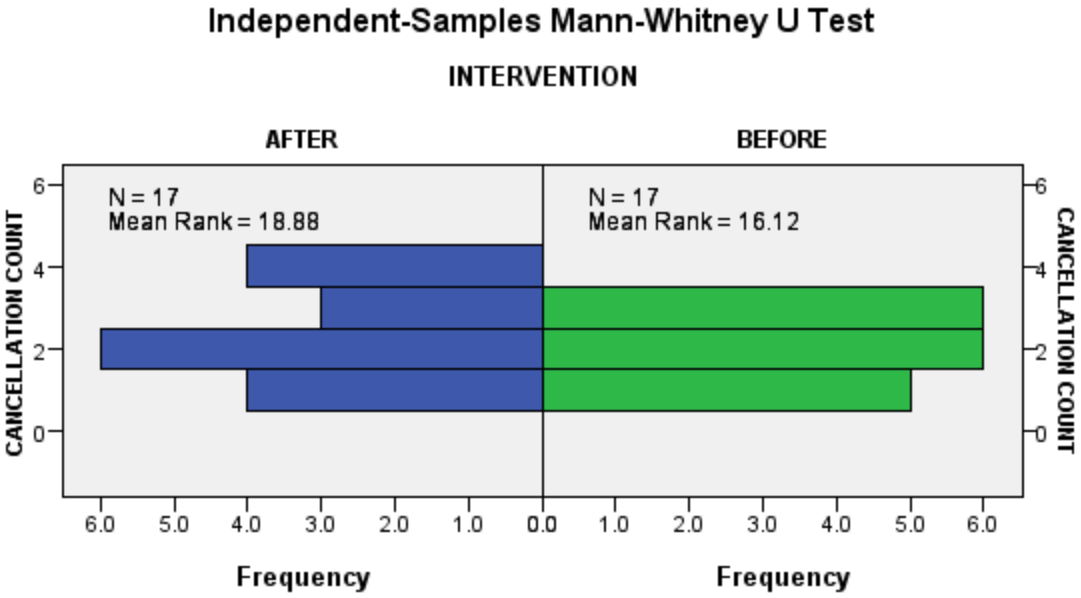
Mann-Whitney U Analysis of Urology cases Pre and Post-Intervention



Total N	20
Mann-Whitney U	32.000
Wilcoxon W	53.000
Test Statistic	32.000
Standard Error	10.513
Standardized Test Statistic	-.951
Asymptotic Sig. (2-sided test)	.342
Exact Sig. (2-sided test)	.444

Appendix H-5

Mann-Whitney U Analysis of Dental cases Pre and Post-Intervention



Total N	34
Mann-Whitney U	168.000
Wilcoxon W	321.000
Test Statistic	168.000
Standard Error	27.819
Standardized Test Statistic	.845
Asymptotic Sig. (2-sided test)	.398
Exact Sig. (2-sided test)	.433

Appendix I

Intervention Completion and Cancellation Reasons

Service	Intervention	Percentage	Cancellation with reason
Neurosurgery (N = 88)			
	Email sent	62% (55)	1 patient illness
	Email not offered	19% (10% Spanish) [17 (9 Spanish)]	1 NPO violation
	Declined/Refused	11% (10)	
	No email address	2% (2)	
	Preoperative nurse unable to reach	5% (4)	1 patient illness, 1 NPO violation 1 cancelled by surgeon (6%) 5 cases cancelled
Plastics (N = 119)			
	Email sent	47% (56)	1 patient illness, 1 surgeon cancellation
	Email not offered	43% (27% Spanish) [51 (32 Spanish)	2 patient illness (1 Spanish speaking)
	Declined/Refused	3% (3)	
	No email address	0.8% (1)	
	Preoperative nurse unable to reach	7% (8)	(3%) 4 cases cancelled
Urology (N = 157)			
	Email sent	58% (91)	1 pending clearance, 2 patient illness
	Email not offered	25% (14% Spanish) [40 (22 Spanish)]	1 patient illness
	Declined/Refused	8% (12)	
	No email address	2% (3)	

	Preoperative nurse unable to reach	7% (11)	1 patient illness, 1 family did not bring equipment (4%) 6 cases cancelled
Dental (N = 294)			
	Email Sent	53% (157)	8 patient illness, 2 NPO violation, 2 no-shows
	Email not offered	31% (21% Spanish) [91 (61 Spanish)]	2 patient illness (1 Spanish)
	Declined/Refused	7% (21)	
	No email address	1% (4)	
	Preoperative nurse unable to reach	5% (15)	3 NPO Violation
	Unable to reach family	1% (3)	
	Voicemail left	1 % (3)	
			(6%) 17 cases cancelled