

Telehealth Utilization to Improve the Patient Care Experience within a General Surgery

Department

Jennifer Moseley

U.S. Department of Veterans Affairs Boston Healthcare System

The University of Alabama College of Nursing

Faculty Advisor: Heather Carter-Templeton, PhD, RN-BC, FAAN

Clinical Advisor: Jennifer Aying, DNP, ACNP- BC

Date of Submission: March 12, 2021

Contents

Abstract.....	4
Background.....	5
Practice.....	6
Patient Analysis.....	8
Problem Statement.....	10
Organizational “Gap” Analysis of Project Site.....	10
Review of the Literature.....	11
Telehealth.....	11
Evidence-Based Practice.....	14
Theoretical Framework.....	15
Goals & Objectives.....	17
Setting Facilitators & Barriers.....	17
Methods.....	18
Project Design.....	18
Project Site and Population.....	19
Measurement Instruments.....	20
Data Collection Procedures.....	20
Data Analysis.....	23
Timeline.....	24
TMPQ.....	27
Interpretation/Discussion.....	28
Conclusion.....	32
References.....	32
Appendix A.....	38
Appendix B.....	39
Appendix C.....	40
Appendix D.....	50
Appendix E.....	51
Appendix F.....	52
Appendix G.....	53
Appendix H.....	55
Appendix I.....	56

Appendix J	58
Appendix K.....	59
Appendix L	60
Appendix M	63
Appendix N.....	64
Appendix O.....	65
Appendix P.....	66
Appendix S.....	69

Abstract

Introduction/Purpose: Patient satisfaction and quality of care are key components of the patient experience. Telehealth has been demonstrated to be an effective, safe and convenient way of providing care to postoperative patients. At the Veterans Health Administration Boston Healthcare System, approximately 20% of postoperative patients had unplanned patient-initiated contact with the medical center. A quality improvement project was carried out to evaluate whether the addition of a nurse practitioner led telehealth visit reduced the number of unplanned contacts by postoperative patients with the general surgery department.

Methods: Patients were recruited through review of the general surgery operating room schedule by the principal investigator. Those patients who underwent anal procedures, colon procedures, cholecystectomy, foregut procedures and hernia procedures were offered an additional postoperative video visit. The patient supplied their email address and was scheduled for the telehealth visit utilizing the Veterans Video Connect software within the first week following surgery. Following their postoperative visit with their surgeon, their charts were reviewed to determine if there was any unplanned contact between surgery and their postoperative visit. The patients were sent a telehealth perceptions questionnaire (TMPQ) following their postoperative visit to evaluate their satisfaction with the telehealth experience.

Results: There was no statistically significant difference in the number of unplanned patient-initiated contacts following the intervention. The telemedicine perception questionnaire results demonstrated that all respondents felt as satisfied talking to a nurse over VVC compared to in person. Further, 91% feel that VVC was a convenient form of healthcare delivery, and 77% feel it will be a way of healthcare delivery in the future.

Discussion: Although there was no decrease in the number of unplanned patient-initiated contacts, the TMPQ data revealed that patients were satisfied with the telehealth intervention. The exact reason for the lack of decrease in the amount of unplanned contact is unknown, however it may be related to the relationship developed between the patient and PI. The patients may have felt more comfortable contacting the surgical department with their concerns. This area represents an area for future research.

Keywords: Telehealth, Surgery, Patient Satisfaction

Telehealth Utilization to Improve the Patient Care Experience within a General Surgery Department

The patient experience encompasses both patient satisfaction as well as the quality of care provided (Gebremedhn & Lemma, 2017). The analysis done by Tevis et. al (2016) of the American College of Surgeon National Quality Improvement Program database found that over six years, approximately 15% of general surgery patients experienced at least one complication following surgery. Surgical complications are linked to poor patient satisfaction following surgery (Cairns et al., 2020). Patients are more satisfied with their care if they feel their needs are acknowledged by their providers (Dragovich et al., 2017). Telehealth provides an avenue for providers to connect with their patients to address their concerns. The role of telehealth in a postoperative setting has been well accepted with high patient satisfaction (Kummerow Broman et al., 2016). The Veterans Affairs Boston Healthcare System (VHABHS) seeks to provide the highest quality care. This project aimed to improve the patient experience within the general surgery department at VHABHS through a nurse practitioner (NP) driven telehealth intervention.

Background

Following surgery, general surgery patients at VHABHS are provided the outpatient general surgery number to call with postoperative concerns. The outpatient NP noted that patients with postoperative concerns were contacting the general surgery department through multiple methods to have their needs met. Although provided with a contact number for the department, these patients had unplanned contact with the medical center. This contact was through a call to the national call center, or their primary care providers. Patients also visited the emergency room, a local hospital or presented to the general surgery clinic for evaluation. Their concerns included issues such as medication questions, pain control issues, diet issues or minor

wound issues. These problems did not always warrant an in-person evaluation and most could have been addressed without the patient coming into the medical center. Furthermore, as these patients had recently undergone a surgical procedure, they were not able to drive themselves requiring another person to bring them to the medical center. These contacts led the patients to voice frustration towards the nurse practitioner of this process.

Using the core values of Integrity, Commitment, Advocacy, Respect, and Excellence (ICARE) the Veterans Health Administration (VHA) is constantly striving to improve the patient care experience. The ICARE values encourage staff to reflect on their environment and develop creative solutions to provide excellent care to patients and improve the patient experience (U.S. Department of Veterans Affairs, 2017a). The *Own the Moment* campaign encourages providers to improve interactions with patients to deliver an excellent patient experience (U.S. Department of Veterans Affairs, 2019). In accordance with the *Own the Moment* campaign and in line with the ICARE values, the NP recognized that the patients' needs were not being met with the current practice and an assessment of the current process was undertaken. These postoperative patient contacts were evaluated through a needs assessment to identify areas in which the department could improve the patient experience.

Practice

The general surgery department provides care for a wide range of conditions in the inpatient and outpatient setting. The surgeries performed include: anal surgery, anti-reflux surgery, bariatric surgery, colorectal surgery, endocrine surgery, hepatopancreaticobiliary surgery, hernia surgery, and surgical oncology (U.S. Department of Veterans Affairs, n.d.). Depending on the surgical procedure being performed, the patients underwent surgery at either the Jamaica Plain Campus or the West Roxbury Campus of the VHABHS. The procedures

performed at the Jamaica Plain Campus were generally ambulatory surgery procedures. The procedures performed at the West Roxbury Campus were generally those in which the patient was admitted following surgery. Once the patient left the hospital, whether it was the same or subsequent day, they were provided with the outpatient general surgery telephone number to call if any concerns arose. This number was listed on their preoperative paperwork as well as their discharge paperwork. Except for endocrine surgery patients and patients who have drains in place, the general surgery department did not routinely call patients following surgery, and there was no planned contact with a general surgery provider until the patient's follow-up visit with their surgeon. This visit typically took place between two to three weeks following surgery.

The VHABHS policy stated that a registered nurse from the ambulatory surgery or medical surgical day unit "will make follow-up calls to patients who have received MAC, regional or general anesthesia within four (4) calendar days following the surgery to inquire about their progress and status" (U.S. Department of Veterans Affairs, 2017b). This policy applied to those patients who underwent ambulatory surgery and were discharged the same day. There was no specific requirement to the content of the call. There was a template available within the electronic medical record (EMR) which the nurse could utilize as a guide. If the patient did not answer, a voicemail was left with a number for the patient to call back; a second phone call was not typically made.

For those patients who were admitted to the hospital, this policy was not applicable. In this population, there was no specific policy which governed follow-up calls. The primary care nursing team within VHABHS would make phone calls to those patients recently discharged who received primary care within VHABHS. Although these calls were the current practice, they were not mandated. Like the ambulatory calls, there was no required content of the call, and

there was a template available which the nurse could use as a guide. For patients who are discharged but do not receive primary care at VHABHS, there was no follow-up call from the VHABHS primary care team.

Patient Analysis

As part of the need's assessment, the patients undergoing general surgery operating room procedures were reviewed. A retrospective audit was performed on all patients who underwent surgery at either the Jamaica Plain or the West Roxbury Campus of VHABHS between July 1, 2019 and September 30, 2019. These dates were selected because any intervention which would take place as a result of the quality improvement proposal would likely take place during that period. The patients were included in the review if they underwent a procedure at either campus which was classified as general surgery during the review time frame. Patients were excluded if they died before discharge. Patients were excluded if they underwent procedures which did not normally receive follow up, such as tunneled line procedures or minor surgery procedures. Endocrine procedures were excluded as the department routinely calls these patients to make postoperative medication changes. Patients were also excluded if there was no planned general surgery follow up after discharge. If the patient underwent multiple procedures within the same admission, only the disposition following the final procedure was evaluated. The patients were evaluated to determine the number of patients who had unplanned patient-initiated contact with the general surgery department before their routine scheduled postoperative visit with the surgeon in the clinic. Contact was defined as any phone call, secure message (similar to an email) early clinic visit, primary care visit to address a surgical concern, or emergency room visit prior to their scheduled postoperative visit.

There were 192 general surgery procedures performed at VHABHS between July 1 and September 30, 2019. After applying the inclusion and exclusion criteria, 150 total patients were analyzed. These patients were assessed differently depending on whether they were ambulatory or admitted. The ambulatory patients were assessed to see if any contact occurred following surgery, while the admitted patients were assessed to determine if contact occurred following discharge before their scheduled postoperative visit. The manner of the contact was noted as well as the reason for the contact.

Of the 150 patients reviewed, 27 patients (18%) contacted the general surgery department. Most patients contacted the department through telephone calls (56%), emergency room visits (22%), secure message (11%) or other means (11%). Other means included earlier than scheduled appointments and electronic consults in the EMR from other providers. The patients were analyzed to determine if there were certain procedures which were more likely to prompt contact. The procedures were grouped by anatomical area and analyzed by contact within each area. Through this analysis, it was possible to identify certain surgical areas which produced the most contact (Appendix A). Those procedures included: anal, cholecystectomy, colon, foregut, and hernia. The postoperative concerns included pain management issues (4/27), wound issues such as edema or concern for infection (14/27), or other concerns such as activity restrictions, illness following surgery or side effects from the procedure (9/27).

One limitation of this review is that the number of patient contacts may be underestimated. While the review was able to identify if patients received care at other VA facilities, there may have been patients who sought care at outside facilities which was not noted in the EMR. There may have been patients who had concerns but did not contact the medical center. Secure messages are not required to be saved into the EMR, and if a provider received a

message from a patient, it may have been addressed but not saved, and therefore not noted on review.

Problem Statement

Almost 20% of general surgery patients contacted the medical center with concerns postoperatively; this indicated that the patient's postoperative needs were not being met. These needs included educational needs such as postoperative pain management or activity expectations. They also included clinical needs such as concern for wound infection, illness following surgery or side effects from the procedure. The goal of this project was to improve the quality of care delivered and improve the patient experience through proactively addressing postoperative concerns utilizing telehealth to reduce the number of unplanned postoperative patient contacts.

Organizational "Gap" Analysis of Project Site

The National Quality Strategy of the Agency for Healthcare Research and Quality (2017) seeks to improve the quality of care by advocating for accessible, patient-centered reliable healthcare. Some of the priorities of the National Quality Strategy include effective communication and coordination of care as well engagement of the patient and their caregivers. The Agency for Healthcare Research and Quality suggests using one of nine levers to improve healthcare quality. One of these levers is leveraging health information technology to improve communication. Telehealth can be used to improve patient communication. Since 20% of patients were contacting the medical center postoperatively with concerns, there was a gap identified between the ideal situation and the current practice. Utilizing telehealth to proactively address postoperative patient concerns allowed the NP to provide individualized patient-centered care for the patient to improve their overall healthcare experience.

Review of the Literature

A review of the literature was conducted to identify relevant literature related to general surgery and telehealth. A PubMed search was performed utilizing the search terms *telehealth* and *surgery*. The search results were limited to those papers written in English and published between 2015 to 2020. Studies were included if a telehealth intervention was applied to a postoperative general surgery population. Other surgical specialties were excluded as the results from other medical or surgical departments may not be generalizable to the general surgery population. Studies were excluded if they were conducted outside the United States as the available technology may differ. Studies were excluded if the sample population was pediatrics as the findings may not be applicable in an adult population. Articles from the search were selected for further review based on their title and were then examined for an in-depth review. Articles were excluded if they did not involve any telehealth modalities as part of the study. There were eleven total articles reviewed as a result of this search. All the articles had relatively small sample sizes with the average number of participants being 82 with the range from one to 238. Five articles were from VA medical centers, four were from university hospitals, one from a cancer center and one did not specify. Six of the articles were cohort studies, 4 were case-control and one was a case report. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart (Figure 1) illustrates the number of papers generated through this search (Moher et al., 2009). A grid was created to summarize the articles reviewed (Appendix C).

Telehealth

Telehealth is defined as the use of technology to provide care in lieu of a traditional in person evaluation (Centers for Medicare & Medicaid Services, n.d.). The role of telehealth

within the postoperative setting is supported in the literature. Telehealth use by postoperative patients has been shown to be well-accepted with high patient satisfaction (Dirnberger & Waisbren, 2020; Eisenberg et al., 2015; Symer et al., 2017; Vella et al., 2015). Patients found telehealth easy to use. Soegaard Ballester et al. (2018) found that 90% of patients found a telehealth follow-up visit to be less hassle than an in-person evaluation. Katz et al. (2016) found that patients felt telehealth encounters were an easy to use tool which was an important part of their recovery. Symer et al. (2017) found that most patients (92.9%) would recommend telehealth to a friend.

Outcomes

Telehealth follow-up has been shown to have similar outcomes to in-person postoperative visits (Dirnberger & Waisbren, 2020; Eisenberg et al., 2015; Kummerow Broman et al., 2015). In the studies, there were no serious complications identified within the telehealth group (Dirnberger & Waisbren, 2020; Eisenberg et al., 2015; Kummerow Broman et al., 2015). Kachare et al. (2020) found that of those patients calling the surgery office, 39% of patients only needed reassurance which led the authors to conclude that telehealth follow-up is a reasonable first step in postoperative patient evaluation. Eisenberg et al. (2015) found that in those patients who underwent laparoscopic inguinal hernia repair, 88.7% were able to be managed solely by telehealth postoperatively. Telehealth not only provides equivalent care but has the added benefit of time savings for both the provider and the patient. Kummerow Broman et al. (2016) found that while there were similar outcomes between in-person and telehealth patients, there was a statistically significant difference in the amount of time spent by the patient. The appointment length for an in-person visit was a range of 15 to 60 minutes while the telehealth visits were five to 30 minutes. Dirnberger, & Waisbren (2020) showed that in addition to the time savings on

appointment length, there was also a savings of travel expenses and productivity costs for the telehealth patients.

VHA population

The benefit to using telehealth within the VHA population is that the providers are not limited by state licensing laws. The Department of Veterans Affairs released guidance granting authority for VA providers to provide care for all patients regardless of their state (U.S. Department of Veterans Affairs, 2018a). This ruling expanded on the jurisdiction of VA providers and allowed for patients who may reside in rural areas to receive care without having to travel great distances. Telehealth has been shown in multiple studies to be successful within a general surgery VHA population (Dirnberger & Waisbren, 2020; Eisenberg et al., 2015; Kummerow Broman et al., 2015). Vella et al (2015) demonstrated that within a VHA population, most patients preferred telehealth in lieu of an in-person evaluation. They also found that VHA reimbursement for travel expenses, had no impact on patients' preferences for telehealth follow-up.

Limitations

The studies reviewed did possess limitations that could limit generalizability. As most of these studies were done with a volunteer population, this may bias the results towards those patients comfortable with telehealth technology. Additionally, all the studies reviewed had small sample sizes which could impact the reliability of the results (Dirnberger & Waisbren, 2020; Eisenberg et al., 2015; Kachare et al., 2020; Katz et al., 2016; Kummerow Broman et al., 2016; Nikolian et al., 2018; Soegaard Ballester et al., 2018; Symer et al., 2017; Vella et al., 2015). Another limitation was that the complication rate in both the in-person and telehealth groups was generally low and the difference between the two groups may not be distinguishable given the

low sample size. The studies found during the literature review range in classification between level III and Level IV based on the University of Michigan classification system (University of Michigan, 2018). There are four level III studies which are case-control studies (Kummerow Broman et al., 2016; Nikolian et al., 2018; Soegaard Ballester et al., 2018; Vella et al., 2015). These studies utilize the telehealth intervention and then have the same patients seen in person to evaluate whether there was any difference with the telehealth intervention. There are six studies which are level IV studies (Dirnberger & Waisbren, 2020; Eisenberg et al., 2015; Kachare et al., 2020; Katz et al., 2016; Kummerow Broman et al., 2015; Symer et al., 2017). These studies are cohort studies using telehealth interventions in a postoperative population. There is one level V study which is a single case report detailing a self-removing drain and telehealth follow up (Qualliotine & Orosco, 2020). There were no randomized clinical trials identified comparing telehealth to in person care in a general surgery population.

Evidence-Based Practice

The goal of this project was to use evidence-based practice to improve the quality of care delivered and improve the patient experience through proactively addressing postoperative concerns. The evidence-based practice which was used was telehealth visits. The literature has shown telehealth as safe and convenient amongst postoperative patients (Dirnberger & Waisbren, 2020). The use of telehealth provided an avenue for the general surgery nurse practitioner to contact patients and address postoperative concerns in a timely fashion following surgery. The PICOT question to be addressed was: Does the addition of a nurse practitioner conducted VVC visit within the first week of surgery compared to the current practice reduce the number of contacts with the VHA before their scheduled postoperative visit in a general surgery postoperative population?

Theoretical Framework

Lewin's Change Theory is a three-step process consisting of unfreezing, moving, and refreezing (Butts & Rich, 2018). This theory served as the groundwork for this quality improvement project and was applied to the general surgery population to enact change. In this quality improvement project, Lewin's Change Theory served as the template for improving general surgery patients' postoperative experience. The application of this theory provided direction on how to conduct the quality improvement project as it provided guidance on what steps to take during each phase of the project.

The first step in Lewin's Change Theory is unfreezing. The unfreezing stage analyzes the current processes and evaluates what does and does not work (Butts & Rich, 2018). During this stage, the needs analysis took place, as did the determination of what factors would impact change (Shirey, 2013). Additionally, stakeholder support for the project was identified during this period (Butts & Rich, 2018). Given the number of postoperative patients with unplanned contact with the medical center, it was clear that the current process was not working. The current practice of not contacting the postoperative patients between surgery and their postoperative appointment was discarded.

The second phase of this theory is the moving period. This period is when new processes are enacted (Butts & Rich, 2018). During this phase, there must be an enactment plan as well as continued stakeholder support (Shirey, 2013). During this time period, the stakeholder support was confirmed and the plan in which to offer VVC visits was developed. This was the period in which the patients were approached to discuss the VVC postoperative visits. This was also the period in which the VVC visits began. Resistance to change can be encountered during this phase (Shirey, 2013). During the implementation of this project, the main resistance encountered

with this project were patients who opted out of the additional video visit. These patients were unable to participate in video visits and did not wish to learn. It was important to keep an open line of communication among providers and address any concerns that the patients or staff have regarding the intervention. There was some confusion among the staff regarding the extra visit and visits were cancelled accidentally as they were mistaken for duplicates. This was identified early and rectified. For this project, utilizing the TMPQ made it possible to evaluate the patient's satisfaction and feelings on the use of VVC during the postoperative period and garner their feedback on the process.

The final phase of Lewin's change theory is the refreezing period. This is an important step to ensure that the new practice continues (Shirey, 2013). During this step, administrative support is essential to continue with new practices. It is also important to provide ongoing training with patients and staff to ensure that the new procedure is maintained and followed by all providers. There should be a system set in place to monitor the training needs of staff and patients to ensure the continued success of the program. As this project was not found to reduce the number of unplanned contacts between patients and the medical center, this process would not be implemented. The data gathered from this project however can be used in order to guide preoperative teaching. During this step, the staff should be educated on the postoperative patient concerns elicited during the project and incorporate these common areas going forward.

Utilizing Lewin's change theory provided a framework to implement this project and guide change. This framework was utilized in this project to reimagine the postoperative experience. Through the three phases of unfreezing, moving and refreezing, the current process was discarded, and a new process enacted to try and improve the overall general surgery

postoperative patient experience. Lewin's change theory provided a template by which the advance practice nurse could impact the patient experience.

Goals & Objectives

The goal of this project was to improve the quality of care delivered and improve the patient experience through proactively addressing postoperative concerns. It was expected that this goal would be demonstrated by a reduced number of unanticipated patient contacts with the general surgery department prior to their scheduled postoperative visit. It was also expected that the patients would respond favorably to the telehealth intervention on the telemedicine perception questionnaire.

Setting Facilitators & Barriers

The Associate Chief of Staff for Education, The Associate Chief of Nursing Service/Academic Affiliations, the Nurse Scientist Committee, and the Chief of Surgery were the main facilitators for this project. The Associate Chief of Staff for Education and the Associate Chief of Nursing Service provided approval for the academic affiliation with the University of Alabama. The Nurse Scientist Committee as well as the Chief of Surgery reviewed and approved this quality improvement project.

The surgery department was the major stakeholder for this project. The Chief of Surgery and Chief of General Surgery approved this project and offered any support necessary for the support of this project (Appendix E). In addition to the Chief of Surgery, five other general surgeons were stakeholders for this project as their patients were included as part of this QI project. They also served as collaborating physicians available for any medical concerns the NP could not address during the video visit.

There were several limitations associated with this project. The main limitation was the sample size. There were relatively small patient numbers within each procedure group type which limited determination of the impact of the intervention specific to each procedure. Additionally, the intervention was limited to those patients who possess the technology to participate in a VVC visit. This may have affected the patient satisfaction scores as those patients who are more comfortable with technology might have been more likely to opt-in. This intervention was also limited by the connection quality as low bandwidth or poor network signal, adversely impacted video quality and evaluation of surgical wounds. The emergence of the novel coronavirus (COVID-19) impacted medical care within VHABHS. This impacted the number of patients who were presenting for care as well as the number of patients who were undergoing surgery.

Methods

Project Design

In response to the needs assessment within the general surgery department, the decision to develop a quality improvement project to enhance the patient experience was made. The PICOT question was developed to guide the project design. The project was designed using telehealth, an evidence-based intervention, with the goal of decreasing unplanned contact with the medical center with surgical related issues. This project aimed to improve both patient satisfaction and the quality of care delivered by addressing any postoperative concerns proactively. It was both qualitative and quantitative in nature. The quantitative aspect of the project sought to decrease the number of unanticipated contacts by postoperative patients and evaluate patient satisfaction with this intervention on a Likert scale. The qualitative data was

collected to help identify any common themes within the postoperative patient concerns. This data was collected to help sculpt the preoperative patient education going forward.

Project Site and Population

This project took place at VHABHS. According to the National Center for Veterans Analysis and Statistics (NCVAS) (2017) as of fiscal year 2017 there were 323,253 veterans living in Massachusetts which accounts for approximately 6.7% of the state population. Of these veterans, the majority are white, approximately 93% are men and 57% are over the age of 65. Of the 323,253 veterans living in Massachusetts, 134,799 veterans were enrolled in the VA Healthcare System and NCVAS reports that 86,163 unique patients were treated within the VHA system in 2017.

The VHA system is organized into multiple Veterans Integrated Service Networks (VISN) (U.S. Department of Veterans Affairs, 2018b). These networks generally consist of multiple states and include all the medical facilities within these areas. If patients require surgery, they are often referred to a tertiary care center. This referral center may be within the VHA or at a local hospital (Beswick et al., 2016). The VHABHS serves as the tertiary referral center for Connecticut, Maine, New Hampshire, Rhode Island, and Vermont. Therefore, the patient population within the VHABHS consists of veterans from all over New England. The VHABHS provides a wide range of services including primary care, mental health and a wide array of medical and surgical specialties (U.S. Department of Veterans Affairs, 2015).

The population for this project were adult patients scheduled to undergo anal, cholecystectomy, colon, foregut or hernia procedures. Those patients were included as these were the groups identified in the need's assessment as those most likely to initiate unanticipated contact post-surgery. The NP offered to schedule an additional postoperative VVC visit with

these patients. During recruitment for the project, the information contained in the recruitment speech was discussed with the patients (Appendix F). The patients were also given a full copy of the participants information/informed consent (Appendix G). They were excluded if they were having combined procedures, were unable to be reached, had opted out for VVC visits, did not possess the necessary technology, did not read and write in English, or did not wish to participate. The goal sample size was 65 patients. This sample size was selected as it equated to an approximate 9% margin of error at a 95% confidence interval for the survey data. This was determined using the Qualtrics calculator (Qualtrics X.M., 2020). In total 65 patients participated in the postoperative VVC visits, however there were only 43 responses on the TMPQ survey.

Measurement Instruments

A patient tracker (Appendix H) was used to track patient concerns. This was used to analyze whether there were specific themes within the patient calls, such as whether the patient was experiencing wound issues, pain control issues, or any other specified complaints. In order to measure patient satisfaction with this intervention, the TMPQ (Appendix I) was used to determine patient's perceptions on telehealth. This survey has proven reliability and validity which made it ideal to measure the patient's satisfaction with the telehealth intervention (Demiris et al., 2000). Permission was granted for use with this project by the author of the survey (Appendix J). This survey was both anonymous and optional. The survey was sent to all patients who completed a video visit irrespective of the technological success of the visit. Technological success was defined as functioning video and audio.

Data Collection Procedures

The plan-do-check-act approach served as the framework for this quality improvement project.

Plan

The needs assessment was conducted to determine the number of patients who were contacting the general surgery department postoperatively with concerns. The charts for all patients who underwent general surgery procedures between July and September 2019 were reviewed. From this data, the PICOT question was developed, and the quality improvement project formulated. This project was discussed with Chief of Surgery to gain approval for this project. The project was sent to the Associate Chief of Nursing Service/Academic Affiliations and the nurse scientist council for review and approval.

Do

Patients who were scheduled for surgery July 1, 2020 and October 14, 2020 were reviewed for inclusion in this project. The patients were recruited for this project at the time of OR booking by the PI, through direct referral from their surgeon, or through review of the OR schedule. This took place either in person or over the phone. The information contained in the recruitment script was discussed with the patients. Those patients who were willing to participate were given a scheduled postoperative VVC visit within the first week of surgery. The date was chosen based on patient preference and provider availability. The patient's information was entered into the VVC booking software- Virtual Care Manager (VCM) as well as the EMR. Verbal consent for the VVC visit and the participation in this quality improvement project was documented in the EMR. The patient was provided the project information sheet as well as the appointment date/time for the video visit. The patients were also provided the PI's personal contact information. At the time of booking, the VCM automatically sent each patient an email containing the web-link for the appointment; this email also contained the VVC website and a test site for the patients to test their equipment prior to the visit. Patients were automatically sent

a reminder email the night before their appointment. At the time of their visit, the patient connected to the VVC software through the web-link contained within the email. During the visit, the PI conducted an overall assessment including pain control and wound assessment as needed. The patient was provided the opportunity to ask questions and have these issues addressed at the time of the virtual visit. If any questions arose during the visit that the PI could not answer, the patient was called back after the visit. If there was a technology failure, the patient was called on the phone by the NP and the visit conducted over the phone. If at the time of the visit the patient preferred a phone visit, the visit was conducted over the phone. The patient concerns which were addressed were documented in the EMR. Following the patient's postoperative visit with their surgeon, the patient was electronically sent the TMPQ for completion.

Check

Following the patient's postoperative visit with the surgeon, their chart was reviewed and analyzed. The patient concern tracker contained all relevant data including unplanned contact and was used for data analysis to determine if there were any unplanned contact with the medical center. This document was used to analyze the data gathered. The number of unplanned contacts were compared with the needs assessment data to determine if there were a reduction in unplanned contacts through this intervention. The survey data were analyzed and reviewed to determine if the patients are satisfied with this intervention. Following the analysis of the data, the information was written up and presented to the Chief of Surgery and all other stakeholders.

Act

The analysis from this project data was used to determine whether this intervention should be recommended for implementation within this population. Issues that were identified during the postoperative visits were noted and used to improve the preoperative teaching plans.

IRB Approval.

This project was approved by the University of Alabama (UA) Institutional review board (IRB) under expedited review category 7 (Appendix K). The project was approved by the Nurse Scientist Committee within VHABHS and was exempt from formal IRB at VHABHS review as it was deemed quality improvement (Appendix L).

Data Analysis

The number of unplanned contacts were analyzed using a t-test. This test was chosen as it provided a way to compare the mean of two populations. The t-test evaluated whether there was a significant difference between the average number of unplanned contacts between the two groups. The population identified in the needs assessment was compared with the intervention population to determine if there were a decrease in the number of unplanned contacts with the general surgery department. The patient concern tracker was reviewed and coded. This allowed for a thematic analysis of postoperative patient concerns. The TMPQ survey was analyzed to evaluate the patient's perceptions on the telehealth intervention. The demographic data (age group, gender) were analyzed to determine if is any significant difference in telehealth satisfaction amongst the different demographic groups.

Cost-Benefit Analysis/Budget

The main cost associated with this project was the time of the nurse practitioner to recruit patients and conduct the video visits. It is estimated that the time for recruitment, conduction of

visit, and documentation took approximately 45 minutes per patient. The hourly pay of the general surgery nurse practitioner is \$59.66. Each patient included in the intervention cost approximately \$44.75. Resulting from this project, there may have been decreased patients visiting an outside hospital emergency room or urgent care (which the VA must reimburse for), a VA emergency room, primary care office, or general surgery clinic. The cost of an emergency room or primary care visit can be extrapolated based on Medicare reimbursement rates (Appendix M). These costs do not take into consideration the travel cost reimbursement for which some patients are eligible. If these patients can be evaluated solely by telehealth, the savings on travel reimbursement results in additional savings to the medical center. No revenue would be generated from these telehealth visits as they would take place within the postoperative surgical global billing period. As this project will be conducted as part of a capstone project, this project took place outside the NP's work hours, therefore there was no additional cost to the facility for this project.

Timeline

The inception of this project began in October 2019 and the full duration of the project including implementation, analysis of data and results dissemination lasted until April 2021 (Appendix N). Submission of this proposal to the Associate Chief of Nursing Service/Academic Affiliations took place in December 2019. The proposal was approved to move forward on December 18, 2019. The project was reviewed by the University of Alabama IRB and given expedited approval under expedited review category 7 on June 3, 2020. Resubmission to the Associate Chief of Nursing Service/Academic Affiliations was done for review at the June 11, 2020 nurse scientist meeting. On July 26, 2020 QI/IRB determination took place and this project was deemed quality improvement and therefore exempt from formal IRB approval. Patient

recruitment began on June 29, 2020. The patients included for recruitment were those patients scheduled to undergo surgery between July 1, 2020 and October 14, 2020. Patient recruitment concluded on October 8, 2020. The video visits were conducted from July 3, 2020 until October 21, 2020. As suggested by the Institute for Healthcare Improvement (n.d.), the intervention was originally slated to take place over the course of approximately eight weeks. Due to the impact of COVID-19, the project lasted more than eight weeks due to lower than expected case volume. Between November 2020 to February 2021, data analysis and manuscript finalization took place. Permission to disseminate results were given on February 26, 2021. Presentation of these findings took place on February 5, 2021 at surgical grand rounds.

Ethical Considerations/Protection of Human Subjects

The University of Alabama IRB approval was obtained before initiating the project. The VHABHS IRB deemed this project quality improvement and therefore exempt from formal review. Any paper copies of records or data were kept in a locked filing cabinet, and all data files were maintained in an encrypted computer database accessible only by authorized personnel. Data was not stored on a PC hard drive. In coordination with VHABHS information risk management, an appropriate folder for electronic study files, on a server approved to hold research data was identified. Identifiable data was not be removed from the VA protected environment at any time. Data will be kept indefinitely or until the law allows their destruction in accordance with the VA Record Control Schedule. Records will be destroyed, when allowed, in the following manner: paper records will be shredded, and electronic records will be destroyed in a way they cannot be retrieved.

Those patients who opted in were scheduled an appointment for the Telehealth visit through the VVC software. The patient concern tracking sheet did not track any identifiable

information. The survey data was anonymous and done through Qualtrics which did not track any personal information or IP address. The risk of harm to participants was minimal. There was some risk that if the telehealth visit did not work it may have caused stress or anxiety for the participants. This was mitigated by conducting the visits over the phone in the event of technology failure. The telehealth visit was in addition to the standard of care. All participants were covered under the Health Insurance Portability and Accountability Act of 1996 which protects the privacy of participants (U.S. Department of Health & Human Services, 2013).

Results

There were 118 eligible surgeries which took place during the 15-week project time frame. Out of the eligible patients, 21 patients declined as they were not VVC capable, and 32 declined for unspecified reasons. Over 15 weeks, video visits were performed on 65 postoperative patients. Most of these patients were male (86%) and the median age of participants was 57 with a range from 26 to 89. On average, the video visit took place on postoperative day (POD) four with a range from POD two to POD seven. Twenty percent of the video visits (13) were converted to phone visits at the time of the scheduled appointment due to patient request. Of the remaining 52 VVC visits attempted; approximately 75% of the video visits (39) were successful, and 25% were unsuccessful (13). Success was marked by having both audio and video available during the visit. The visits ranged in length from 4 to 45 minutes, the average visit took 17 minutes with the median being 15 minutes. A breakdown of the VVC visit times by procedure is in Appendix O. A thematic analysis was done for the issues addressed during the postoperative video visits. The results of this are reported in Appendix P. The most common issues addressed included pain or medication issues. Out of the 65 visits performed, there was unplanned patient-initiated contact by 18 (27%) patients. A breakdown of the reason

for unplanned contact by surgical procedure is reported in Appendix Q. The contact occurred on average POD seven with a range from POD 1 to POD 27. The main reason for unplanned contact was pain, experienced by five (10%) of the patients. A t-test was performed to evaluate the difference within each procedure group before and following the intervention. There was no statistically significant difference found between the number of unplanned patient-initiated contacts before and following the intervention amongst any of the procedure groups. (Appendix R).

The foregut patient group had the highest percentage of unplanned contact with the medical center following the intervention. Prior to the intervention, 33% of the foregut population had unplanned contact with the medical center, following the intervention, this rose to 46%. The foregut group was further analyzed to determine if there were any difference between the amount of time spent during the VVC visit between those patients who had unplanned contact and those who did not. For those foregut patients without unplanned contact, the average visit was 21 minutes, for those patients with unplanned contact, the average visit was 17 minutes. There was no statistical significance found between these two groups ($p=0.32$).

Those patients who had an issue discussed during their postoperative visit were more likely to have unplanned patient-initiated contact prior to their follow up visit. Only 10% (2/21) of those patients who had no issues discussed had unplanned contact compared with 36% (16/44) in those patients who had issues addressed during their VVC. This difference was found to be statistically significant ($p= 0.02$).

TMPQ

The TMPQ data were reviewed. The response rate was 65% (42). Most respondents were male (89%) and between the ages of 56-65 (35%). Almost all the patients who completed the

survey had a successful video visit (91%), there were only four patients who completed the survey who had an unsuccessful visit. Most of the respondents were those who underwent hernia (49%) or foregut (37%) procedures. In general, most respondents agreed or strongly agreed (84%) that they were as satisfied talking to a nurse over VVC as talking in person. All the respondents felt that a nurse can get a good understanding of their medical problem over VVC. Most patients (91%) felt that VVC was a convenient form of health care delivery and 95% felt that it saves time. Ninety-eight percent of patients felt that VVC could be used in addition to the regular care that they receive. VVC was felt to improve general health by 81% of patients. VVC was felt to make it easier to contact the nurse by 79% of patients. Overall, 77% of patients felt VVC will be a standard way of health care delivery in the future.

Only 7% of patients felt that VVC could violate their privacy. The use of necessary equipment seemed difficult to 7% of patients and 28% of patients felt they could not always trust the equipment to work. About 21% of patients did not like that there was no physical contact over VVC. Regarding cost savings, a little over half (58%) of respondents felt that VVC could save them money, and 83% of patients felt that VVC could reduce costs for the health care agencies. Most patients (93%) felt VVC could save time for the nurses. For full TMPQ analysis see Appendix S.

Interpretation/Discussion

In the intervention group, there was a higher percentage of unplanned patient-initiated contact with the medical center compared with those patients prior to the intervention; this difference was not found to be statistically significant ($p=0.11$). As part of this project, each patient was provided with the contact information for the general surgery department as well as the personal office number for the PI. The increase in contact may be directly related to the

intervention. Patients may have felt more comfortable contacting the PI with concerns as they had a specific contact person and had developed a beneficial relationship. This relationship may have made patients more comfortable with their provider and may explain the increase in contact seen with this project.

Those patients who were undergoing foregut procedures had the highest percentage of unplanned contact prior to the intervention. Following the intervention, this group was still one of the highest groups with unplanned contact, albeit not statistically significant. These patients undergo complex surgeries that require major lifestyle changes following surgery. Their postoperative visits typically occur about three weeks following surgery. During their VVC visit, most patients needed counseling on their medication regimen or diet. The complex nature of their procedures and dietary/lifestyle changes may explain their rates of contact. These patients may require additional support not required by the other surgical patients. This group may benefit from an additional visit closer to the time of surgery to help support their postoperative recovery. This group may also benefit from additional preoperative teaching to address their postoperative concerns.

The TMPQ data demonstrated that patients were satisfied with the VVC visits. Most patients responded favorably on the survey. The survey reveals that patients found the VVC an acceptable, convenient way to manage their health. Patients were as satisfied with VVC as talking in person, though there was concern from patients that they were not able to be examined as well by VVC. This concern could be mitigated by addressing this concern preoperatively. The provider could explain to the patient what they are looking for postoperatively and reassure the patient that their needs could be adequately addressed by VVC. A quarter of the patients felt that they were not able to trust the equipment to work, these patients could be offered access to VA

owned equipment in order to mitigate this concern. By providing equipment that has been tested and functioning, it could allay the patient's fear that the equipment would fail during the visit. Alternatively, providing a backup such as a visit by phone, or store and forward technology where the patient can send photos then speak over the phone would also allow the patient to feel that their needs were properly met.

Approximately 20% of the VVC visits were converted to phone visits at the time of the visit per patient request. The main reason behind this conversion was that the patient forgot their scheduled visit or was not in a location suitable for the VVC visit. Since the patient does not need to visit the medical center in person, they may have forgotten about their scheduled visit. Although the patients received an email the night before their appointment, this was not enough to prevent forgotten appointments. If administrative staff were to contact the patients by phone the day prior or the day of their scheduled appointment, this may reduce the number of forgotten appointments and increase adherence with the video visits.

Almost 20% of the eligible patients declined to participate as they were not VVC capable due to lack of either email or internet-capable device. This demonstrates that there is a significant number of patients undergoing surgery who lack access to the required technology. As technology becomes more prevalent, these patients would benefit from additional support in order to increase their access and comfort with technology. Providing VVC capable devices would allow these patients to access this technology. One-quarter of the attempted VVC visits were unsuccessful. The main reasons for this failure were due to technical issues such as the video or audio freezing, or failure to access the camera/microphone on the patient's device. Unfortunately, the patient's access to a strong internet connection provided a limitation for them to connect to the VVC. Failure to access the camera and microphone is a result of a technical

issue on the patient's end, usually caused by the permission settings for the phone. Despite attempting to troubleshoot this issue with the patients, it was unable to be overcome. All patients should be encouraged to have a test VVC and referred to the telehealth team to increase patient proficiency with VVC visits as troubleshooting issues took a significant amount of time.

Providing access points and a private area for patients at local VA centers with support staff would allow patients the opportunity to access a dedicated space with strong internet access to combat these technical issues.

Limitations

This project had at least five major limitations. First, the sample size of only 65 patients was quite small. This limits the ability to generalize the data gathered from this project. The number of respondents to the TMPQ was also quite small; this further limits the generalizability of the data. As patients opted to participate in this project, this may predispose those patients who are comfortable with the technology to participate. This self-inclusion may skew the results of the TMPQ to positive opinions of telehealth as this population is already comfortable with this technology. Most people who completed the TMPQ survey were those with successful VVC visits. This may skew the survey data to reflect those patients who had successful visits and may not capture those patients who required telephone visits due to technology failure. There was a large percentage of patients who desired conversion to phone visits at the time of the scheduled appointment, these patients were still included in the TMPQ survey. It is unclear how their decision to convert to a phone visit influenced their response to the TMPQ survey. Lastly, only the VHABHS EMR was reviewed to determine if unplanned contact occurred. There may have been contact with outside facilities or providers which were not included in the VHABHS EMR and therefore would not be captured through chart review.

Conclusion

This project demonstrated that despite a proactive approach to postoperative care, a large percentage of postoperative patients continued to have patient-initiated unplanned contact with the medical center. Telehealth was shown to be accepted by patients with high satisfaction. Although there was not a reduction in the number of patient-initiated contact following surgery, there may still be a role for personalized postoperative contact by a provider within the first week of surgery. This may be especially important to those patients undergoing foregut procedures who have dietary and lifestyle changes. It is hypothesized that the personal contact with the PI allowed patients to feel more comfortable addressing their concerns with their surgical team. Connectedness to the medical center and to the surgical team was not analyzed within this project and would represent an interesting area of future study to determine if this personalized contact impacts the patient's overall approval of VA care. It would also be helpful in future research to also analyze patients' perspectives on telehealth who declined to participate in this project. This would help to determine if there was a specific reason that the patients are declining VVC. Identifying possible barriers to patient adoption of VVC would help to break down these barriers and identify ways to increase patient participation with VVC. Although this project did not show a decrease in unplanned patient contacts, it provided valuable feedback on the reasons that patients were contacting the department. These identified areas can be incorporated into preoperative teaching to help address patients' questions proactively and help improve the patient's overall surgical experience.

References

Agency for Healthcare Research and Quality. (2017). *About the national quality strategy*.

<https://www.ahrq.gov/workingforquality/about/index.html>

- Beswick, D. M., Vashi, A., Song, Y., Pham, R., Holsinger, F. C., Rayl, J. D., Walker, B., Chardos, J., Yuan, A., Benadam-Lenrow, E., Davis, D., Sung, C. K., Divi, V., & Sirjani, D. B. (2016, June). Consultation via telemedicine and access to operative care for patients with head and neck cancer in a Veterans Health Administration population. *Head Neck, 38*(6), 925-929. <https://doi.org/10.1002/hed.24386>
- Butts, J. B., & Rich, K. L. (2018). *Philosophies and theories for advanced nursing practice*. Jones & Bartlett Learning.
- Cairns, A., Battleday, F. M., Velikova, G., Brunelli, A., Bell, H., Favo, J., Patella, M., Lindner, O., & Pompili, C. (2020, May). General patient satisfaction after elective and acute thoracic surgery is associated with postoperative complications. *Journal of Thoracic Disease, 12*(5), 2088-2095. <https://doi.org/10.21037/jtd-19-3345b>
- Centers for Medicare & Medicaid Services. (n.d.). *Telemedicine*. <https://www.medicare.gov/medicaid/benefits/telemed/index.html>
- Demiris, G., Speedie, S., & Finkelstein, S. (2000). A questionnaire for the assessment of patients' impressions of the risks and benefits of home telecare. *Journal of Telemedicine and Telecare, 6*(5), 278-284. <https://doi.org/10.1258/1357633001935914>
- Dirnberger, J., & Waisbren, S. (2020, Sep). Efficacy of telehealth visits for postoperative care at the Minneapolis VA. *American Journal of Surgery, 220*(3), 721-724. <https://doi.org/10.1016/j.amjsurg.2020.01.015>
- Dragovich, A., Beltran, T., Baylor, G. M., Swanson, M., & Plunkett, A. (2017, Nov). Determinants of Patient Satisfaction in a Private Practice Pain Management Clinic. *Pain Practice, 17*(8), 1015-1022. <https://doi.org/10.1111/papr.12554>

- Eisenberg, D., Hwa, K., & Wren, S. M. (2015). Telephone follow-up by a midlevel provider after laparoscopic inguinal hernia repair instead of face-to-face clinic visit. *Journal for the Society of Laparoscopic and Robotic Surgeons*, 19(1), e2014.00205. <https://doi.org/10.4293/jsls.2014.00205>
- Gebremedhn, E. G., & Lemma, G. F. (2017). Patient satisfaction with the perioperative surgical services and associated factors at a University Referral and Teaching Hospital, 2014: a cross-sectional study. *Pan African Medical Journal*, 27, 176. <https://doi.org/10.11604/pamj.2017.27.176.10671>
- Kachare, M. D., Rossi, A. J., Donohue, K. D., & Davidov, T. (2020, Mar 11). Telesurgical Assessment: Using Smartphone Messaging to Efficiently Manage Postoperative Wounds. *Telemedicine Journal and E Health*. <https://doi.org/10.1089/tmj.2019.0270>
- Katz, M. H., Slack, R., Bruno, M., McMillan, J., Fleming, J. B., Lee, J. E., Bednarski, B., Papadopoulos, J., & Matin, S. F. (2016, May 1). Outpatient virtual clinical encounters after complex surgery for cancer: a prospective pilot study of "TeleDischarge". *J Surg Res*, 202(1), 196-203. <https://doi.org/10.1016/j.jss.2015.12.054>
- Kummerow Broman, K., Oyefule, O. O., Phillips, S. E., Baucom, R. B., Holzman, M. D., Sharp, K. W., Pierce, R. A., Nealon, W. H., & Poulouse, B. K. (2015, Dec). Postoperative Care Using a Secure Online Patient Portal: Changing the (Inter)Face of General Surgery. *J Am Coll Surg*, 221(6), 1057-1066. <https://doi.org/10.1016/j.jamcollsurg.2015.08.429>
- Kummerow Broman, K., Roumie, C. L., Stewart, M. K., Castellanos, J. A., Tarpley, J. L., Dittus, R. S., & Pierce, R. A. (2016, Oct). Implementation of a Telephone Postoperative Clinic in an Integrated Health System. *J Am Coll Surg*, 223(4), 644-651. <https://doi.org/10.1016/j.jamcollsurg.2016.07.010>

- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009, Jul 21). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*, 6(7), e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- National Center for Veterans Analysis and Statistics. (2017). *State summary Massachusetts*. https://www.va.gov/vetdata/docs/SpecialReports/State_Summaries_Massachusetts.pdf
- Nikolian, V. C., Williams, A. M., Jacobs, B. N., Kemp, M. T., Wilson, J. K., Mulholland, M. W., & Alam, H. B. (2018, Oct). Pilot Study to Evaluate the Safety, Feasibility, and Financial Implications of a Postoperative Telemedicine Program. *Ann Surg*, 268(4), 700-707. <https://doi.org/10.1097/sla.0000000000002931>
- Qualliotine, J. R., & Orosco, R. K. (2020, Jun). Self-removing passive drain to facilitate postoperative care via telehealth during the COVID-19 pandemic. *Head Neck*, 42(6), 1305-1307. <https://doi.org/10.1002/hed.26203>
- Qualtrics X.M. (2020). *Sample size calculator*. <https://www.qualtrics.com/blog/calculating-sample-size/>
- Shirey, M. R. (2013, Feb). Lewin's Theory of Planned Change as a strategic resource. *J Nurs Adm*, 43(2), 69-72. <https://doi.org/10.1097/NNA.0b013e31827f20a9>
- Soegaard Ballester, J. M., Scott, M. F., Owei, L., Neylan, C., Hanson, C. W., & Morris, J. B. (2018, Apr). Patient preference for time-saving telehealth postoperative visits after routine surgery in an urban setting. *Surgery*, 163(4), 672-679. <https://doi.org/10.1016/j.surg.2017.08.015>
- Symer, M. M., Abelson, J. S., Milsom, J., McClure, B., & Yeo, H. L. (2017, Sep). A Mobile Health Application to Track Patients After Gastrointestinal Surgery: Results from a Pilot Study. *J Gastrointest Surg*, 21(9), 1500-1505. <https://doi.org/10.1007/s11605-017-3482-2>

Tevis, S. E., Cobian, A. G., Truong, H. P., Craven, M. W., & Kennedy, G. D. (2016, Jun).

Implications of Multiple Complications on the Postoperative Recovery of General Surgery Patients. *Ann Surg*, 263(6), 1213-1218.

<https://doi.org/10.1097/sla.0000000000001390>

U.S. Department of Health & Human Services. (2013). *Summary of the HIPAA privacy rule*.

<https://www.hhs.gov/hipaa/for-professionals/privacy/laws-regulations/index.html>

U.S. Department of Veterans Affairs. (2015). VA Boston Healthcare system.

<https://www.boston.va.gov/services/specialty.asp>

U.S. Department of Veterans Affairs. (2017a). I CARE core values. <https://www.va.gov/icare>

U.S. Department of Veterans Affairs. (2017b). Patient care memorandum-112-001-SAC..

U.S. Department of Veterans Affairs. (2018a). Authority of health care providers to practice

telehealth. <https://www.federalregister.gov/documents/2018/05/11/2018-10114/authority-of-health-care-providers-to-practice-telehealth>

U.S. Department of Veterans Affairs. (2018b). Locations.

<https://www.va.gov/directory/guide/region.asp?map=1&ID=1>

U.S. Department of Veterans Affairs. (2019a). VA Boston Healthcare System.

<https://www.boston.va.gov/locations/directions.asp>

U.S. Department of Veterans Affairs. (2019b). *Veterans experience office*.

www.va.gov/VE/pressreleases/2019050901.asp

U.S. Department of Veterans Affairs. (n.d.). *General Surgery*. [Brochure]

University of Michigan. (2018). *Research guides*.

<https://guides.lib.umich.edu/c.php?g=282802&p=1888246>

Vella, M. A., Kummerow Broman, K., Tarpley, J. L., Dittus, R. S., & Roumie, C. L. (2015, Dec). Postoperative Telehealth Visits: Assessment of Quality and Preferences of Veterans. *JAMA Surg*, 150(12), 1197-1199. <https://doi.org/10.1001/jamasurg.2015.2660>

Appendix A

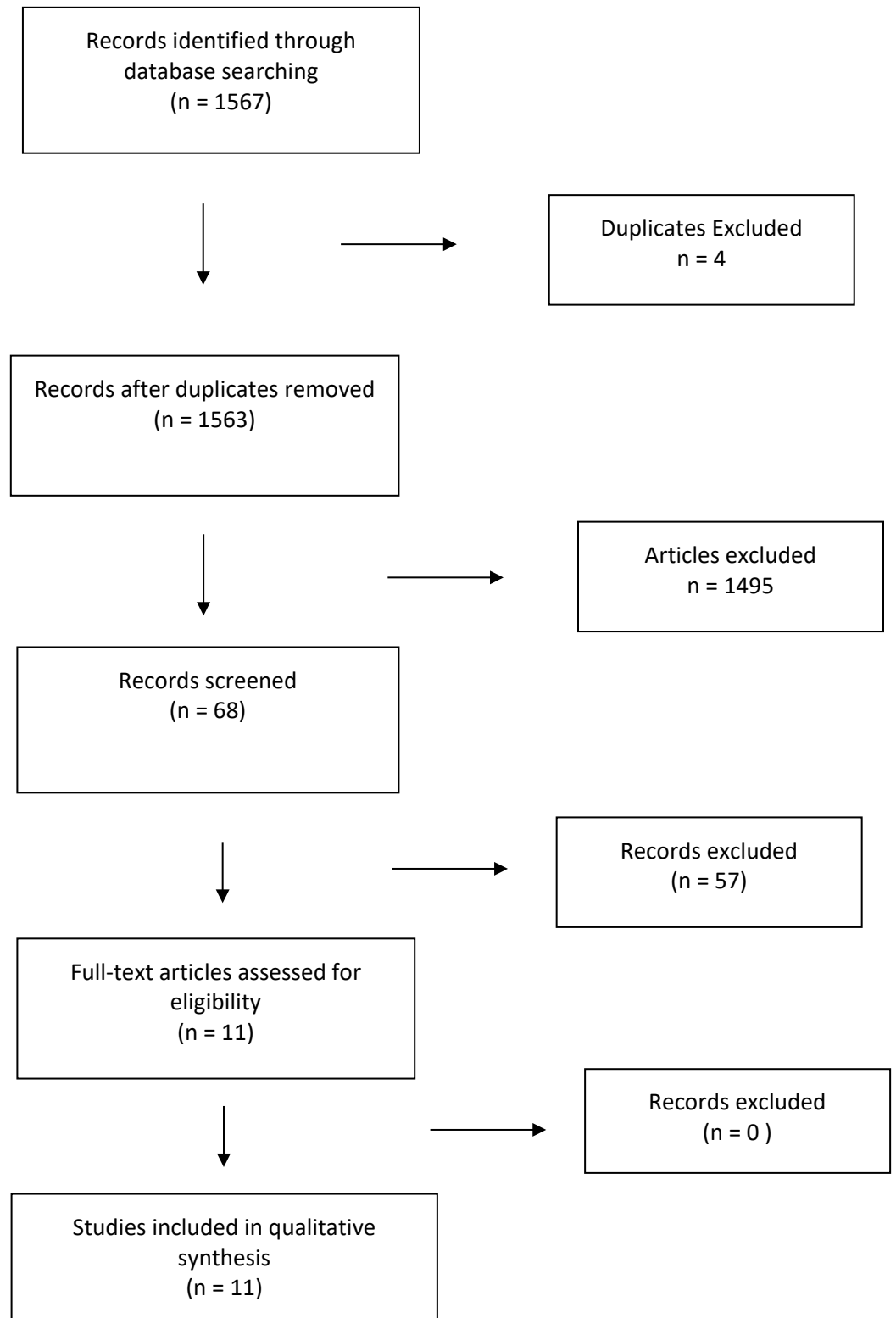
Table 1

General Surgery Procedure Classification

Classification	Procedures Included	Number of patients making contact/total patients undergoing procedure	Percentages of patients within category making contact
Anal	Exam under anesthesia, hemorrhoidectomy, fissurectomy, anal fistula repair	3/15	20%
Cholecystectomy	Cholecystectomy-laparoscopic or open	4/23	17%
Colon	Right or left hemicolectomy, colostomy, ileostomy takedown, low anterior resection, abdominoperineal resection	5/30	17%
Foregut	Gastrectomy, Nissen fundoplication, sleeve gastrectomy, roux en y gastric bypass	5/15	33%
Hernia	Abdominal hernia, incisional hernia, inguinal hernia	8/52	15%
Miscellaneous	Any procedure not listed above	2/15	13%

Appendix B

PRISMA 2009 Diagram



Appendix C

Literature Grid

Source/ Year	Purpose	Sample/Setting	Design	Variables/Instru ments	Results	Implications	Level of Evidenc e*
Dirnberg er & Waisbren , 2020	The purpose of this study was to evaluate the feasibility of telehealth visits in a general surgery population.	VA general surgery patients in Minnesota.	Cohort study	A patient survey was conducted prior to telehealth visits and following the telehealth visits to evaluate satisfaction.	The patient satisfaction with telehealth visits was high 9.6/10. Since the patients only had to visit a local VA, they saved money and time due to transportation costs. Limitations: At 167 patients it was a small sample size and homogenous population.	The study found that patients were satisfied, saved time and money and no complicatio ns were missed by using telehealth instead of an in-person visit.	Level IV
Eisenber g, Hwa, & Wren, 2015	The purpose of this study was to evaluate the feasibility of	VA patients who underwent laparoscopic inguinal hernia repair between March 2013 and June 2014.	Retrospect ive Cohort study	PA performed postoperative phone calls reading a prewritten script	Of the patients, 88.7% were managed solely by telehealth. One patient had	Telephone follow up is feasible, well-liked with no	Level IV

	a telephone follow-up postoperatively.				a complication in the telehealth group which required further evaluation. Almost all patients (90.9%) patients were satisfied with telehealth as the sole follow up. Limitations: It was a small sample size (62 pts) in a homogenous population	compromise to the quality of care.	
Kachare et al., 2020	The purpose of this study was to Evaluate the feasibility of telehealth follow-up for patients with concerns postoperatively.	Patients undergoing general surgery procedures who called the surgeons offices with concerns were included.	Cohort Study	The patient used their personal mobile phone to transmit photographs to the surgeon.	Approximately 39% of the patients who contacted the office only needed reassurance. Of those that required intervention, 46% required a prescription and 15% required an emergency	Telehealth follow-up for concerned patients is reasonable to evaluate patients as a first step.	Level IV

					room visit for further evaluation. Limitations: Small sample size		
Katz et al., 2016	The purpose of this study was to evaluate a virtual clinical encounter (VCE) to evaluate patient satisfaction and reduce adverse events.	Pancreas cancer patients at a large cancer center.	Cohort study.	VCE to conduct the visit. A patient survey was administered through Qualtrics.	Patients felt VCE were important part of their recovery. 11% of AE's were discovered by VCE. Most patients perceived the VCE as secure. Limitation: Small sample size.	VCE is a feasible tool to use postoperatively. Patients are satisfied with this method of care.	Level IV.
Kummerow Broman et al., 2015	The primary goal of this study was to evaluate both patient and surgeon acceptance of online portal in lieu of in-person visits.	Tertiary referral center general surgery department.	Prospective pilot study-case control.	Online asynchronous visits using an online patient portal to upload wound photos,	A statistically significant difference was found in the amount of time for both the provider and the patient between in person and telehealth	Most patients felt they would be fine with an online telehealth follow up (76%).	Level IV

					<p>follow up. Surgeons felt an online visit was useful to decrease travel but cited need for physical exam as limiting factor. There were two false positives in telehealth category where patients felt they had a recurrence but did not.</p> <p>Limitations: small sample size</p>		
Kummerow Broman et al., 2016	The primary goal of this study was to evaluate the number of clinic visits per patient with a secondary endpoint of complication	VA Hospital setting. Patients were included who underwent low-risk abdominal, neck and skin procedures.	Cohort Study	Phone calls were made by mid-level house staff and a physician assistant using templated notes.	There were similar complication rates in the pre and post intervention group. There was decreased clinic use by 50% in the eligible patients. The	Telehealth is a feasible method of conducting postoperative follow-up. The savings of clinic time makes additional spots available for	Level III

	n rates of patients.				<p>clinic time comparison showed the in-person visits to be longer than the telehealth visits (5 to 30 minutes vs. 15 to 60 minutes).</p> <p>Limitations: Small sample size.</p>	patients who need to be seen in person.	
Nikolian et al., 2018	The purpose of this study was to evaluate the feasibility, safety, and cost of an eclinic for postoperative patients.	Patients undergoing laparoscopic cholecystectomy, laparoscopic appendectomy, ventral or umbilical hernia repair & inguinal hernia repair (irrespective of open/laparoscopic) over a 10-month period at a University Hospital were included.	Case-control.	Frequency of readmission, reoperation, emergency room visits, length of time of visits and satisfaction were all evaluated.	There was no difference found between the in person and telehealth groups regarding readmission, reoperation, ED visits within 30 days or deaths. Total time was less and found to be statistically significant in the e-health group.	This is one of the few studies that uses telehealth on non-elective operative patients. It demonstrates that telehealth is a viable alternative for this population. In survey's conducted, patients were satisfied	Level III.

					Limitations: small sample size, and the use of volunteers that may bias towards those who are comfortable with the technology.	with the care provided.	
Quallioti ne, & Orosco, 2020	This was a single case report of a self-removing drain to facilitate telehealth follow up.	One patient who underwent neck dissection.	Case Report	Telephone follow up was used.	The patient did well, was able to self-remove her drain at the appropriate time and underwent telehealth follow-up with no complications. Limitations- This was a case report, only one patient which limits the ability to apply this to larger populations.	This was only one patient; however, this technique could be utilized to make telehealth follow-up feasible to a larger population	Level V
Soegaard Ballester	The purpose of this study	Sample included all in-state patients scheduled for	Case Control	Phone visits using Epic with a	Most (90%) patients felt that	The study had a large	Level III.

et al., 2018	was to assess feasibility, outcomes and patient satisfaction with a telephone follow-up after surgery.	low-risk operations at a University Health System. Low-Risk included: umbilical, inguinal, and minor ventral or incisional hernias, laparoscopic cholecystectomies and appendectomies.		template to prompt the advanced practitioner was used. The patients received a survey following the experience.	<p>telephone follow-up was less of a hassle than an in-person visit. The phone group was compared to those ineligible out of state patients. The telephone group had fewer in-person encounters. The number of adverse events was similar in both groups.</p> <p>Limitations: Researchers did not track visits to other disciplines and therefore the complications may have been higher. There was a small sample size.</p>	proportion of eligible patient's opt-in, which demonstrates patients' willingness to participate in telehealth.	
-----------------	--	--	--	---	--	---	--

Symer et al., 2017	The purpose of this study was to Evaluate the feasibility of a mobile application to track recovery. Secondary outcomes included: patient satisfaction, return to baseline, trend in pain scores, and the number of days a technical issue occurred.	Adult colorectal patients at a University Hospital.	Cohort Study	The tool used was a self-developed application for mobile phones. The application uses surveys about daily activity, pain, a validated tool-photo affective meter (PAM) as well as incorporates Fitbit data.	Most (83.9%) patients successfully interacted with the application. A majority (92.9%) would recommend the application to a friend, and 89.3% found the application easy to navigate. Pain scores peaked on postoperative day 5, and approximately 1.1 alerts per patient were generated. Limitations- There was a small sample size, 5.7% of the patients had a technical issue.	The study showed that the application was feasible and well accepted by the postoperative patient.	Level IV
Vella et al., 2015	The purpose of this study was to	VA population. Convenience sample of patients undergoing low-	Case Control Study	A patient survey was used to evaluate the	Most patients preferred telehealth	Most patients preferred	Level III.

	<p>measure the quality of care as well as patient preference for telephone, video or in-person visit.</p>	<p>risk general surgery procedures (cholecystectomy, umbilical/ventral hernia, inguinal hernia, non-perforated appendectomy, thyroidectomy/parathyroidectomy or skin excision).</p>		<p>preference for telehealth. Outcomes-general recovery, follow-up needs, wound-care needs, postoperative complications. Travel pay status was also evaluated to determine if this influenced preference to in-person visit.</p>	<p>(69%). The patients that preferred telehealth travelled further than those who preferred in-person visit. When comparing telehealth modalities, 39% preferred telephone visits versus 30% for video visits. There was no association with travel pay status and visit preference. There was a 96% agreement between visit types for wound needs/complication. There was 100% agreement with general recovery and</p>	<p>telehealth to in-person visits. There was a slight preference to telephone versus video visits. Telehealth provides adequate follow-up after low-risk general surgery procedures.</p>	
--	---	---	--	--	---	--	--

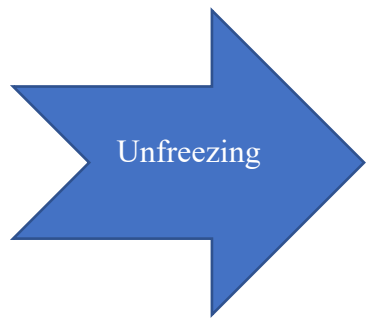
					follow-up needs. Limitations: small size		
--	--	--	--	--	---	--	--

* Note: Level of evidence determined by University of Michigan. (2018, September 20). Research Guides.

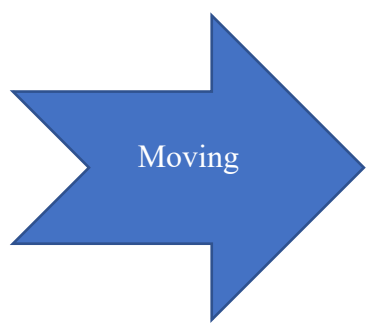
<https://guides.lib.umich.edu/c.php?g=282802&p=1888246>

Appendix D

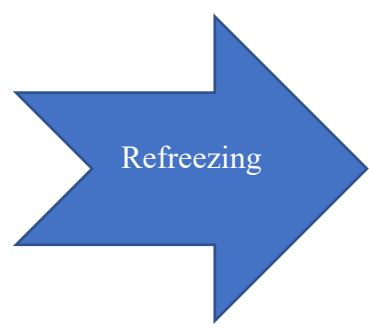
Lewin's Change Theory



- Needs Assessment
- Determination of processes to change
- Enlist stakeholder support
- Discard current processes



- Enactment plan
- Continued Stakeholder support
- Communication with patients and staff
- Implementation



- Stakeholder support to enact new policies
- Changes become new normal
- Determine necessary steps to ensure continued success
- Continued training

Appendix E

Stakeholder Support

From: Itani, Kamal [BHS] Sent: Friday, June 5, 2020
8:41 AM To: Moseley, Jennifer M. Subject: Project

Jennifer,

This message serve to provide my full support for your project entitled:” Telehealth Utilization to Improve the Patient Care Experience within the General Surgery Department.” I know that you had selected this project before the COIVID pandemic. This project takes even more importance with the pandemic and after shifting the majority of our care to virtual care. We will provide you with all the support to successfully complete this project and hopefully learn from it and implement best practices to improve patient experience.

Best of luck,

Kamal Itani MD

Chief of surgery and Chief of General Surgery

Appendix F

Recruitment Script

I am calling regarding a research study being conducted at the University of Alabama. You were selected as you are undergoing a general surgery procedure involving the anus, colon, gallbladder, or stomach. This study examines how a video visit following surgery impacts your experience. If you agree to participate, I will schedule a video visit with you within a week following surgery or discharge. During that visit I will address any postoperative questions you may have including pain management, wound management, activity restrictions, etc. If we experience technical difficulties with the video, your visit would take place over the phone. After your in-person visit, I will send you a survey to complete. This survey is voluntary and will get your feedback regarding the video visit. All your answers to the survey will be anonymous and you do not need to complete any questions you do not feel comfortable answering. Your participation will help us evaluate our process and provide better healthcare for veterans with the only risk being some of the questions may make you feel uncomfortable. Your participation in the study is voluntary you may refuse to take part in this study or, if you decide to participate in the study, you may decide not to answer any questions that make you feel uncomfortable or to stop the interview at any time. I expect that this process should take no more than 1 hour of your time including the video visit and the survey. I will email you a copy of the full consent form for you to review prior to your video visit. May I schedule your video visit?

Appendix G

Informed Consent

Please read this information below. This will give you information to help decide if you want to be a part of the study.

Consent Form Key Information

- After surgery have a video visit
- Answer a survey to see your satisfaction
- If the video visit does not work, your visit would take place over the phone.
- All participants must be at least 18 years old

Purpose: The goal of the project is to use video visits to help provide better care. The goal of this project is to reduce your concerns after surgery. We are hoping this will make your experience better. We hope to use the information to improve our process.

What you will do in the study: For this project, patients will be asked if they want to take part. You may be asked if you are having a certain surgery. Your visit will take place with the surgery nurse practitioner. During this visit any problems or questions you have will be answered. You will still have your normal visit with your surgeon. After your visit you will be asked to answer a short survey. This survey will help us look at your experience with the video visit. The survey would be optional. You could skip any questions you do not wish to answer. Your participation in the video visits is completely voluntary and does not impact your care if you decline.

Time required: The visit and survey will require about 30 minutes of your time.

Risks: If the video visit does not work you may feel stress trying to set up the visit.

Benefits: This visit provides an additional opportunity to ask questions.

Confidentiality: The survey does need your name. The video visit is completed on a secure website, does not save any personal information including IP address and does not record. All information will be stored on the VA system which is a safe location. Any paper copies would be kept in a locked file cabinet in a locked office.

Voluntary participation: Your participation is optional. If you do not want to take part, you will receive the normal care after surgery. Your care will not change if you do not participate.

Right to withdraw from participation: You have the right to stop taking part at any time without penalty.

How to withdraw from participation: If you wish to stop taking place in the study just tell the nurse practitioner you wish to stop the video visit. You can also call the general surgery office: 857-203-5764 and notify us. There is no penalty for stopping to take part.

Compensation/Reimbursement: You will not be paid for participating.

If you have questions or need to report a project related issue please contact, contact:

Jennifer Moseley

NP
General Surgery
857-203-5764
Jennifer.moseley@va.gov

Heather Carter-Templeton
Capstone College of Nursing
Telephone: 205.348.2725
Email address: hcartertempleton@ua.edu

If you have questions about your rights as a participant in a research study, would like to make suggestions or file complaints and concerns about the research study, please contact: Ms. Tanta Myles, the University of Alabama Research Compliance Officer at (205)-348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach Website at <http://ovpred.ua.edu/research-compliance/prco/>. You may email the Office for Research Compliance at rscompliance@research.ua.edu.

Appendix H

Patient Concern Tracker Example

Procedure	Procedure Date	VVC Date	VVC Successful	POD	Length of Visit	Issues Discussed	Contact	Reason	POD	Age	Gender
<i>Colectomy</i>	<i>11/29/19</i>	<i>12/2/19</i>	<i>No- No audio. Connected to audio through phone</i>	<i>3</i>	<i>30</i>	<i>Wound issue- erythema around incision. Return to work</i>	<i>Yes</i>	<i>Needs Return to work letter</i>	<i>7</i>	<i>70</i>	<i>M</i>

Appendix I

Postoperative patient survey
Your results will remain anonymous

Demographics:

Age (circle one): 18-25, 26-35, 36-45, 46-55, 56-65, 66-75, Older than 75

Gender (circle one): Male, Female, prefer not to answer

_____ I had a successful postoperative Video Connect visit (both audio and visual worked)

_____ I did not have a postoperative Video Connect visit (there was a problem with audio, visual or both)

For every statement please check one and only one box:

- A nurse can get a good understanding of my medical problem over VVC.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC can violate my privacy.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- The use of the necessary equipment seems difficult to me.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- I can be as satisfied talking to the nurse over VVC as talking in person.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC can improve my general health.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC can save time for the nurses.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC cannot save me any money.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- Using VVC the nurse will be able to monitor my condition well.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- I don't like that there is no physical contact during a VVC visit.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC is a convenient form of health care delivery for me.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC saves me time.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC will be a standard way of health care delivery in the future.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC can be an addition to the regular care I receive.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC can reduce costs for the health care agencies.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- A nurse cannot examine me over VVC as well as in person.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- VVC makes it easier for me to contact the nurse.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

- I cannot always trust the equipment to work.

Strongly Agree Agree Disagree Strongly Disagree No Opinion

Additional Comments:

Survey courtesy of : Demiris, G., Speedie, S., & Finkelstein, S. (2000). A questionnaire for the assessment of patients' impressions of the risks and benefits of home telecare. *Journal of Telemedicine and Telecare*, 6(5), 278-284.

Appendix J

Survey Permission

From: **Demiris, George** <gdemiris@nursing.upenn.edu>
Date: Mon, Dec 9, 2019, 10:25
Subject: Re: Survey permission
To: Jennifer (Jenn) Moseley <jmmoseley1@crimson.ua.edu>

Thank you for your message and your interest in the survey.

Yes you can use the questionnaire, we only ask that you acknowledge the article in your citation.

Of course we recommend replacing the term “TeleHomeCare” with the term used to describe your system best (e.g. home telehealth, or other). Similarly, the phrase “over the television” can be replaced with “over video[conferencing]”).

Please let me know if you have any questions or need more information.

Sincerely,

George Demiris PhD, FACMI

PIK (Penn Integrates Knowledge) University Professor

Department of Biobehavioral Health Sciences, School of Nursing &

Department of Biostatistics, Epidemiology and Informatics, Perelman School of Medicine

University of Pennsylvania

Philadelphia, PA

215-898-8559

Appendix K

University of Alabama IRB Approval



June 3, 2020

Jennifer Moseley
Capstone College of Nursing
Box 870358

Re: IRB # 20-02-3366, "Telehealth utilization to improve the patient care experience within the general surgery department"

Dear Ms. Moseley:

The University of Alabama Institutional Review Board has granted approval for your proposed research. Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of written documentation of informed consent. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The approval for your application will lapse on May 31, 2021. If your research will continue beyond this date, please submit the continuing review to the IRB as required by University policy before the lapse. Please note, any modifications made in research design, methodology, or procedures must be submitted to and approved by the IRB before implementation. Please submit a final report form when the study is complete.

Good luck with your research.

Sincerely,

Carpantato T. Myles, MSM, CHM, CIP
Director & Research Compliance Officer

Appendix L

VABHS Determination of Research

VABHS Request for Determination of Research Status

(See Addendum A for definition of activities that may or may not constitute research)

Title of Project:

Telehealth utilization to improve the patient care experience within the general surgery department

Director of Project or Responsible Contact:

Jennifer Moseley NP

E-mail:

jennifer.moseley@va.gov

Phone:

Identify the VA Program under which the work was completed (e.g., patient care, education, quality assurance, quality management, etc.). If that national Program Office has registered an opinion regarding the research vs. non-research nature of the project, attach documentation of that opinion to this form.

Quality Improvement

Project Summary: Please provide a paragraph (500 words or less) describing the purpose (e.g. quality assurance, quality improvement, case report, report of program development/ implementation, program evaluation) and procedures of the project, and your plans for communicating the findings. Please note any deadlines or other relevant information.

The purpose of this project is to improve the patient care experience within the general surgery department. The patients who undergo certain general surgery procedures have historically high rates of contact with the general surgery department between surgery and their postoperative visit. Contact is defined as any emergency room visit, phone call, secure email, early clinic visit, or primary care visit to address a surgical concern. Between July 1, 2019 and September 1, 2019 approximately 33% of patients undergoing foregut procedures, 20% of those undergoing anal procedures, 17% of the cholecystectomy and colon patients, and 15% of the hernia patients contacted the general surgery department. These patients called with concerns regarding pain issues, wound issues or other issues related to their procedures which required a provider to address. This high rate of contact signified that patients had unmet needs following surgery. This project seeks to proactively address patient concerns through a video visit utilizing the Veterans Video Connect (VVC) software. The patients who are undergoing anal procedures, cholecystectomy, colon, foregut and hernia procedures would be offered an additional VVC visit during the week following surgery. The VVC visit would be arranged prior to the patient's surgery. Either in person or on the phone, the rationale for the visit would be explained and the patient would be sent an information sheet. During this visit, the general surgery nurse practitioner (Jennifer Moseley) would perform an overall assessment including pain control and wound assessment as needed. The patient would be provided the opportunity to ask questions and have their needs addressed. If there is a technology failure, the visit could be done over the phone. The VVC software is already in use throughout the medical center for video visits. If there is a medical emergency, the provider has the ability to call 911 and direct emergency services to the patient's address. If there was a concern which the nurse practitioner could not address, a surgeon is on call 24 hours per day 7 days per week who could be consulted. All visits would be documented in the EMR utilizing the VVC visit location and would document any concerns addressed in the patient visit. Following the patient's postoperative visit they would be given an anonymous telemedicine perception questionnaire through Qualtrics to survey their satisfaction with the VVC visit. The number of contacts before and after this intervention would be compared to determine if this reduces the number of patients with unmet needs. The patient's satisfaction would be evaluated to determine if they are happy with this intervention. The results of this intervention would be reported and shared with the Chief of General Surgery to determine if this intervention should be implemented long-term. This quality improvement project is being done as part of the capstone requirement for a Doctor of Nursing Practice Degree. This project has been reviewed by the University of Alabama IRB and given expedited approval under category 7. A waiver of written documentation has also been granted.

SCREENING QUESTIONS: Is this Project RESEARCH?

Answering “NO” to either question below is indicative of RESEARCH and the project protocol will need to be submitted for research committee review.

Is the project designed and/or implemented solely for internal VA purposes in support of a VA mission? Yes No

YES indicates that nothing is added to the design beyond what is needed to achieve the identified VA purpose and the project does not have an additional aim to develop or contribute to generalizable knowledge outside VA. (For example: collecting data or performing analysis beyond what is needed for the original VA purpose of the activity.)

Are the findings of this activity intended to be used exclusively by and within VA or by entities responsible for overseeing VA? Yes No

Answering “YES” to any of the questions below is indicative of RESEARCH and the project protocol will need to be submitted for research committee review.

Is the activity designed for the purpose of contributing to generalizable knowledge? Yes No

If NO, identify a purpose related to VA operations that justifies the design of the project:

The purpose of this project is to improve the patient experience within the general surgery department. The goal is to evaluate whether a proactive phone call from the general surgery nurse practitioner reduces the number of concerned patient calls and visits to the hospital between surgery and their postoperative visit. It will provide us an opportunity to evaluate the patient's perspectives on the video connect in order to improve our process.

Is the activity designed to expand the knowledge base of a scientific discipline or scholarly field of study? Yes No

Is the activity funded or supported as research? Yes No

If YES, describe the source of funding and provide the title of the program or project that received funding:

- Is the activity a clinical investigation as defined under Food and Drug Administration (FDA) regulations? Yes No
- Does the activity include double-blind intervention? Yes No
- Does the activity include a placebo control? Yes No
- Does the activity include prospective patient-level randomization to a clinical intervention? Yes No
- Has the activity been supplemented or modified before, during, or after implementation in order to produce information to expand the knowledge base of a scientific discipline or scholarly field of study or to otherwise contribute to generalizable knowledge? Yes No
- Has the purpose of the activity changed so that it is now designed or intended to expand the knowledge base of a scientific discipline or scholarly field of study or otherwise contribute to generalizable knowledge? Yes No

Signatures:

Moseley, Jennifer M. Digitally signed by Moseley, Jennifer M.
Date: 2020.06.04 14:59:41 -0400

Project Director or Responsible Contact

Printed name and Date

This project has been reviewed according to VA Boston Healthcare System procedures and has been determined to be non-research; oversight by VABHS Research Committees is not required.

Mieke Verfaellie Digitally signed by Mieke Verfaellie
Date: 2020.06.25 16:28:49 -0400

IRB or R&DC Representative

Printed name and Date

NOTES:

(1) Additional review is required prior to presentation or publication of data from a non-research activity outside VA. The principal author or presenter should complete the *VABHS Publication Review Form* and submit it along with the manuscript or presentation in its near final form to the IRB Coordinator to initiate review.

(2) Publication or presentation of non-research activities outside VA does not, in and of itself, constitute research. (See VA Handbook 1058.05.)

Appendix M

Cost Analysis Table

CPT Code/Encounter Type	Minimum Cost	Maximum Cost
99285 (Emergency Room Visit)	\$164.43	\$266.46
99215 (Office/outpatient visit established)	\$106.46	\$210.25
Nurse Practitioner Time	\$59.66/hour	

Appendix N

Project Timeline

- October 2019- Project Conception/needs analysis
- December 17, 2019- Submission to Associate Chief of Nursing Service/Academic Affiliations
- December 18, 2019- Approval to move forward with project/Affiliation agreement started
- January 2020- Affiliations Agreement fully executed
- May 2020- Submission to the University of Alabama IRB
- June 2020- Review at VA nurse scientist meeting
- June 2020- QI/IRB determination
- July-Fall 2020- (dates contingent on IRB approval) Recruitment and Implementation.
- January- April 2021- Data analysis
- March 2021- Results dissemination/manuscript preparation
- March 2021- Approval to disseminate results

Gebremedhn, E. G., & Lemma, G. F. (2017). Patient satisfaction with the perioperative surgical services and associated factors at a University Referral and Teaching Hospital, 2014: a cross-sectional study. *Pan Afr Med J*, 27, 176. <https://doi.org/10.11604/pamj.2017.27.176.10671>

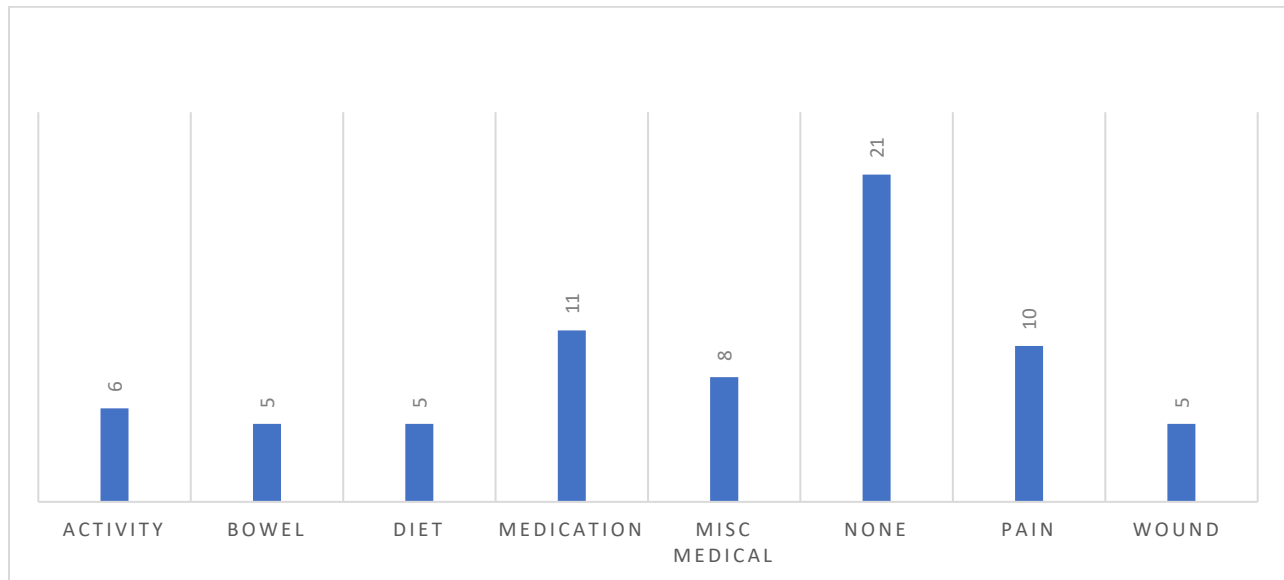
Appendix O

VVC Visit by Procedure

Procedure	Mean postoperative day	Visit length (minutes)
Anal	4	17
Cholecystectomy	5	12
Colon	7	12
Foregut	5	20
Hernia	3	14

Appendix P

Thematic Analysis of VVC Visits



Note: Patients with more than one issue were counted in each category which applied

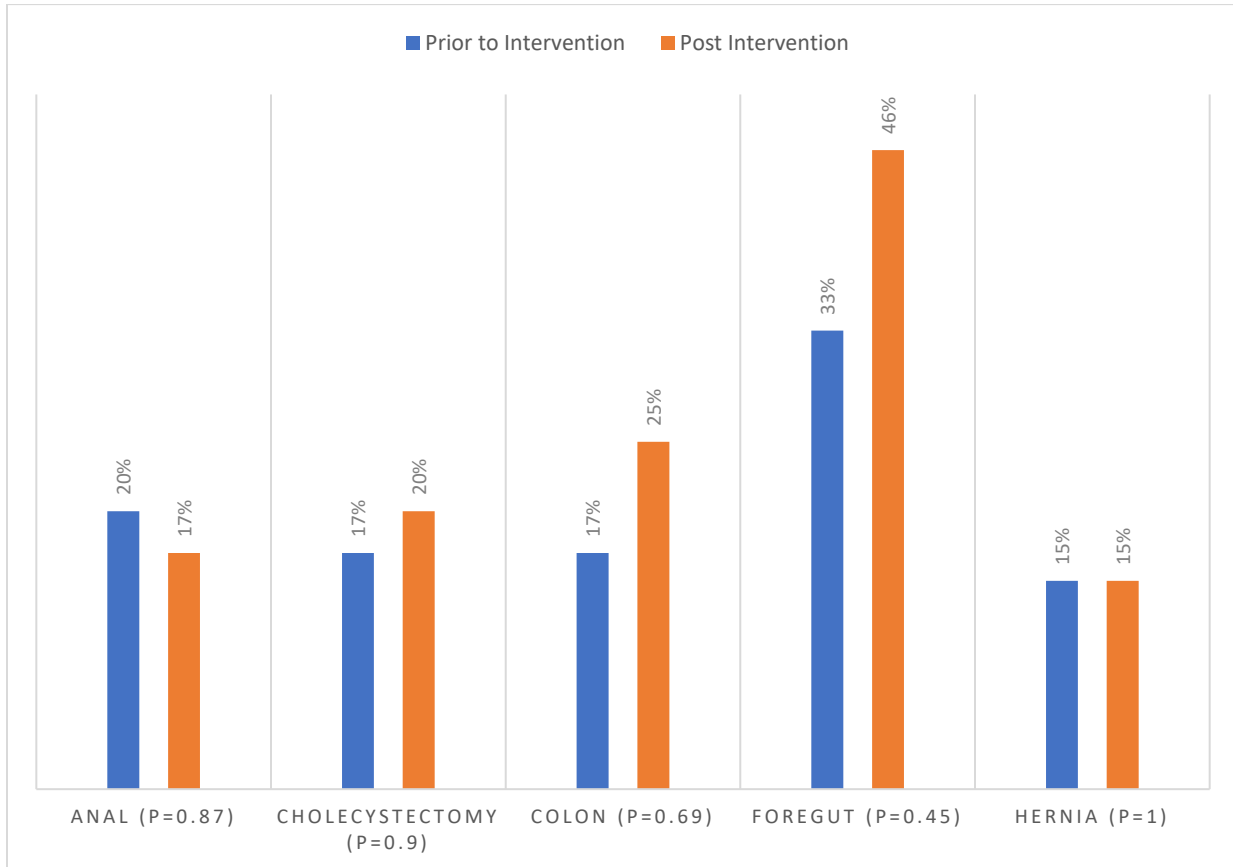
Appendix Q

Unplanned Contact by Procedure Type

Procedure	Patients with unplanned contact/Total number of procedures	Percentage of Procedures	Percentage of Total Procedures
Anal	1/6	17%	2%
Colon	1/4	25%	2%
Cholecystectomy	1/5	20%	2%
Foregut	11/24	46%	17%
Hernia	4/26	15%	6%

Appendix R

Unplanned Contact Pre- and Post-procedure



Appendix S

TMPQ Survey Data

Question	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
A nurse can get a good understanding of my medical problem over VVC	60% (26)	40% (17)	0	0	0
VVC can violate my privacy	0	7% (3)	51% (22)	33% (14)	9% (4)
The use of the necessary equipment seems difficult to me	2% (1)	5% (2)	44% (19)	47% (20)	2 % (1)
I can be as satisfied talking to the nurse over VVC as talking in person	37% (16)	47% (20)	12% (5)	2 % (1)	2% (1)
VVC can improve my general health	23% (10)	58% (25)	5% (2)	0	14% (6)
VVC can save time for the nurses	42% (18)	51% (22)	2% (1)	0	5% (2)
VVC cannot save me any money	9% (4)	7% (3)	33% (14)	26% (11)	26% (11)
Using VVC the nurse will be able to monitor my condition well	26% (11)	61% (26)	5% (2)	2 % (1)	7 % (3)
I don't like that there is no physical contact during a VVC visit	7% (3)	14% (6)	53% (23)	16% (7)	9% (4)
VVC is a convenient form of health care delivery for me	40% (17)	51% (22)	2% (1)	2% (1)	5% (2)
VVC saves me time	58% (25)	37% (16)	0	5% (2)	0

VVC will be a standard way of health care delivery in the future	33% (14)	44% (19)	9% (4)	0	14% (6)
VVC can be an addition to the regular care I receive	58% (25)	40% (17)	0	2% (1)	0
VVC can reduce costs for the health care agencies	48% (20)	36% (15)	2% (1)	0	14% (6)
A nurse cannot examine me over VVC as well as in person	16% (7)	51% (22)	26% (11)	5% (2)	2% (1)
VVC makes it easier to contact the nurse	16% (7)	63% (27)	9% (4)	2% (1)	9% (4)
I cannot always trust the equipment to work	5% (2)	23% (10)	51% (22)	12% (5)	9% (4)