Program Evaluation of Surgical Prehabilitation

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Introduction

Problem Description

Frail patients are associated with increased rates of 30-day unplanned hospital readmission and worse perioperative outcomes (Wahl et al., 2017). Frailty is defined as "a state of vulnerability with reduced physiological reserve affecting the capacity to maintain or regain homeostasis when exposed to stressors, such as surgery, that place patients at increased risk of adverse health outcome" (Wahl et al., 2017, p. 750). Modifiable risk factors including inadequate nutrition, obesity, smoking, hyperglycemia, anxiety, and suboptimal management of morbid comorbidities also add to the surgical risk (Bilimoria et al., 2013; Leeds et al., 2018). In response, surgical prehabilitation has become the standard of care for many hospitals. This international approach is intended to optimize a patient's physical, mental, and nutritional status. The preoperative interventions provided by this multimodal and multidisciplinary approach is focused on identified modifiable risk factors. Studies support a decrease in morbidity, length of stay, and reduction of complication (Molenaar, et al., 2019, Waterland, et al., 2021).

The Veterans Affairs (VA) Portland Health Care System has not initiated prehabilitation screening or intervention. According to the VA Surgical Quality Improvement Program (VASQIP), the General Surgery (GS) service had a surgical cancellation rate of 11.2% in fiscal year (FY) 2020. The 30-day readmission rate was 10.3% of the 320 inpatient surgeries.

Available Knowledge

In 2014, there were over 21 million surgeries in inpatient or ambulatory settings in the United States (Steiner et al., 2017). A 2013 study determined adverse events occur in 14.4 % of patients and 47.5% of these events were considered moderate, severe, or fatal (Anderson et al.).

For the patient, the consequences of surgical complications can result in prolonged hospitalization, longer rehabilitations, or permanent changes to their health. In addition to patient consequences, there are financial consequences to the hospital, third-party payers, and profit margins (Healy et al., 2016). In the case of government-funded healthcare, such as Medicare, Medicaid, and Veteran Health Administration (VHA), this avoidable financial burden is absorbed by taxpayers.

The risk of complications varies based on the patient's baseline health, habits, and comorbidities. There are several tools and calculators available to quantify this risk. The American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) and the Physiological and Operative Severity Score for the enUmerations of Mortality and Morbidity (POSSUM) are both designed to identify surgical risk factors predictive of adverse outcomes. In this original approach, risk factors can be divided into physiological and operative variables include age, cardiac status, respiratory status, vital signs, and lab results while operative variables include the risk of the procedure, quantity of procedures, blood loss, malignancy, and urgency (Copeland et al., 1991). Examples of modifiable risk factors in these calculators include weight, nutritional status, smoking, and diabetes control. These variables remain unchallenged and are still considered in assessing surgical risk factors.

In addition to these risks, many of the negative effects of surgeries can be attributed to the stress response triggering a catabolic cascade that releases inflammatory mediators, suppresses anabolic hormones, and contributes to sodium and fluid retention (Cusack & Buggy, 2020). This stress response, sometimes referred to as the fight or flight response, is a primordial survival mechanism intended to provide energy and maintain cardiovascular equilibrium (Brown et al., 2018). The adverse consequences of an ongoing state of stress experienced during surgery can result in protein catabolism, hyperglycemia, hypertension, tachycardia, and immunosuppression (Brown et al., 2018). Frailty is also a significant preoperative concern. The prevalence of frailty increases with age. Frailty is caused by limited biological reserve and is associated with adverse post-operative outcomes (Hewitt, et al, 2018).

It is believed that prehabilitation will better prepare patients for surgery and negate some of these stress induced complications. Surgical prehabilitation is gaining popularity internationally. The preoperative goal, referred to as "prehabilitation", is to optimize patient health in order to decrease the physiological stress response that occurs as a result of surgery by engaging the patient in enhancing their recovery (American College of Obstetricians and Gynecologists [ACOG], 2018; Brown et al., 2018; Kalogera & Dowdy, 2016; Ljungsvist et al., 2017).

Rationale

The VA Portland has not incorporated prehabilitation into its surgical pathway. The current process does not provide periodic contact or support to the patient to assess readiness for surgery. This project sought to introduce these steps.

It was decided to incorporate a shared decision making (SDM) model into the prehabilitation counseling to help achieve desired outcomes. SDM has been found to increase patient satisfaction and reduce decision conflict (Shay & Lafata, 2015). The guiding ethical principle of SDM is respect for the patient's autonomy (Kraus & Marco, 2016). Including the patient in decision making is not a new concept for nursing. It builds upon several nursing theories, most noticeable Dorothea Orem's Self-Care Theory. SDM has also been endorsed by the Institute of Medicine (Baker, 2001) and Section 3506 of the Affordable Care Act (2010).

VHA introduced a new model of care referred to as Whole Health. This model is intended to be patient-centric, to lead to personalized and proactive health care. The Whole Heath goal is to change the conversation from "what is the matter with you?" to "what matters to you?", a statement attributed to Maureen Bisognano, President and CEO of the Institute for Healthcare Improvement (Krejci et al., 2014). VHA has developed a "Circle of Health" picture that includes important aspects of self-care including physical, emotional, mental, and spiritual, well-being to facilitate these conversations. The goal of this national initiative is to change the conversation between practitioners and Veterans from paternalistic to an SDM approach to strengthen the patient's innate capacity to heal (Krejci et al., 2014). Whole Health coaches are available to educate staff in building relationship-based care so that front-line care providers can work with Veterans to inspire personal transformation. The approach intends to improve health outcomes, improve quality of care, increase both provider and patient satisfaction, and reduce costs associated with healthcare (Krejci et al., 2014).

Specific aims

This project aim is aims to evaluate the effectiveness of the prehabilitation program on postoperative outcomes after general surgery. The individualized prehabilitation plan is created by the patient and registered nurse (RN) using a shared decision-making model. It is anticipated that by engaging in shared decision making for pre-operative goals the patient will be more committed to success.

Methods

Context

This quality improvement project was done at a 160- bed, acute care VA Medical Center (VAMC) serving almost a million Veterans. In the fiscal year 2020, 1,545 inpatient and 2,391

outpatient surgeries were performed at this facility according to the VASQIP data. This VA is one of two tertiary care centers available to Veterans in Alaska, Washington, Oregon, and Idaho. There is no existing surgical prehabilitation process in place. Surgical specialties include cardiac, ear, throat, and nose (ENT), general surgery, gynecology, neurologic, ophthalmology, orthopedic, plastic, podiatry, thoracic, urologic, vascular, and kidney and liver transplant.

Surgical cancellations occur in 10.5% of scheduled cases at this institution. Almost 70% of canceled cases are due to "patient related issues" or "patient health status". Overall, 30-day readmission rates are 10.9%, with thoracic and vascular having the highest rates at 21% and 16.8% respectively. According to VA Portland workload reports, postoperative length of stay (LOS) has also increased by 1.4 days since the previous fiscal year. This represents a 30.7% increase in LOS.

Intervention

The stakeholder group consisted of representation from general surgery, vascular surgery, physical therapy, dietician, social work, and nursing. The group created a screening tool to identify modifiable behaviors such as hyperglycemia, smoking, poor functional status, and malnutrition. An intervention was recommended for each area of concern.

An RN was identified to provide prehabilitation evaluation and shared goal setting to non-urgent general surgery candidates. The RN was trained in the Whole Health model including group facilitation, shared decision-making conversation skills, and motivational interviewing.

A progress note with the screening tool was placed in the electronic health record (EHR) to inform the primary care provider of the plan and request assistance in meeting medical goals (e.g., tobacco cessation, diabetic management). Information was provided to the patient by the

RN for programs that required self-referral (e.g., MOVE! the national VA weight management program). Consults for physical therapy, social work, dietician, and pain management would be placed by the RN. Weekly virtual group meetings were designed to allow patients to support each other to meet their individual goals. Following the postoperative outpatient visit, the RN and patient would meet for a final time to discuss future goals.

Once indicated for surgery, the patient met with the RN to identify modifiable risk factors for surgical complications and to develop a Personal Health Plan. The Personal Health Plan is created based on information from the Personal Health Inventory self-assessment (Appendix C). A Whole Health Coach was anticipated to assist in these conversations until the RN was confident in these new skills.

PDSA Cycle 1

During the first Plan-Do-Study-Act (PDSA) cycle the RN attended the general surgery outpatient clinic. Patients requiring large abdominal wall hernias requiring complex reconstruction, colostomy takedowns, or colectomies for benign diseases received prehabilitation screening. At the end of week three, no patients met the criteria for inclusion. Following a stakeholder discussion, it was decided to broaden the study to include any patient anticipated to require hospital admission following surgery and to consider patients currently on the surgical waitlist.

PDSA Cycle 2

The general surgeon reviewed the surgical waitlist to identified patients that would require post-operative hospital admission. The RN called these patients and completed a screening. Any clinic patient indicated for surgery requiring postoperative hospitalization also received prehabilitation screening.

Study of the Intervention

The study of the intervention included monitoring the number of surgeries canceled for patient-related issues for patients that underwent prehabilitation screening and intervention. Additional monitors intended to include hospital days of care and readmissions within 30 days of surgery based on chart review. The data from this fiscal quarter of surgery was to be compared to a historical quarter with similar surgical cases.

Measures

The primary outcome measure would be surgery cancellation, LOS, and 30-day readmission care. These metrics are available quarterly in the VASQUIP report. The process measure was to be the completion of goal setting and participation in any of the group meetings. The balancing measure would be the number of surgeries that are delayed by the patient related to prehabilitation.

Data Analysis

This quality improvement project was implemented between October 1, 2021, and December 31, 2021. VASQUIP data from FY2021 Quarter (Q)3 data was to be compared to information from FY2022 Q1. FY2021Q4 data was to be excluded to account for the transition and development of this new model. Goal setting and group meeting participation was to be tracked for each participating patient. Success or ongoing efforts to meet goals was to be determined at the post-operative visit.

Ethical Consideration

No identifiers or characteristics of the patients was to be documented. This project was submitted to the VA and OHSU Investigational Review Board (IRB) and was deemed not to be research and did not need further review. Non-participation with this prehabilitation project or failure to reach SDM goals would not impact the patients' access to surgery.

Results

Of the ten patients that met the criteria for inclusion, two declined to be assessed for prehabilitation. Of the remaining eight, three did not respond to attempts to contact and two patients chose to have their surgeries in community hospitals to have their procedure sooner. The most common risk factor identified using the assessment tool was obesity; all three patients declined to participate in weight reduction efforts. One patient agreed to participate in a preoperative pain course. Only one patient underwent surgery during the project period and remains in a long-term care facility. Due to the inability to engage patients, weekly meetings did not occur.

	Jul	Aug	Sep	Oct	Nov	Dec	Jan- Mar
Complete IRB determination or approval (703A)	X						
Finalize project design and approach (703A)			Х				
PDSA Cycle 1 (703B)				X			
PDSA Cycle 2 (703B)					X		
Final data analysis (703B)						Х	
Write sections 13-17 of final paper (703B)							X
Prepare for project dissemination (703B)							X

Discussion

Summary

There were several obstacles that created delays in this project. The planning phase overlapped with several stakeholders' vacation schedules resulting in increased workload on

remaining colleagues. As a result, stakeholder meetings for project planning were delayed. Once stakeholders returned from vacations, there was a surge in hospitalization of patients with SARS-CoV-2. Consequentially operative care nursing staff were reassigned to the bedside, and elective surgeries were postponed. Non-urgent surgeries that would require post-operative hospitalizations were delayed, preserving hospital beds and staff for patients requiring care for SARS-CoV-2.

As a consequence of this re-prioritization of resources, the clinics and operating rooms were at significantly reduced capacity at the inception of this quality improvement project. No patients were identified to participate during the first month of the project. In the second PDSA cycle, inclusion criteria were expanded to patients previously indicated for surgery that remained on a waitlist. Telephone contact was attempted for these patients. Given the challenges of providing relationship-based services over the phone, this outreach effort was not included in the original plan. Additionally, it did not prove to be effective in increasing participation.

The assessment tool created for this project was successful in identifying risk factors. The development of this tool was a multidisciplinary, evidence-based collaboration. The tool used objective information obtained predominantly from a chart review. Concerns ascertained from this assessment were brought to the attention of the appropriate healthcare provider to address. If a self-referral was required, the patient was provided with that information.

Interpretation

There was insufficient data for analysis. Given that clinics were running at 25% capacity, it was difficult to enroll patients. Early data suggests that motivating patients to address lifestyle changes in the short time between indication and surgery would be challenging.

Limitations

There were several limitations related to SARS-CoV-2 including access and staffing. Another potential limitation was that there was only one RN available to assess patients in a single surgical service line. Training in Whole Health was required for the RN and was predominantly provided via computer modules and there was no dedicated Whole Health staff to support the RN or role model the process.

Conclusions

The strict timeline of this project coincided with a challenging period in healthcare related to the pandemic. Whether this prehabilitation process would be successful remains unknown. The project could be relaunched post-pandemic when access to surgical care is restored.

Based on the poor engagement of the patients that were approached it is unclear if the Whole Health approach, or any other SDM approach, would be effective in this conceptual framework. The Whole Health approach encourages goal development and autonomy based on patient-identified values. Healthcare partners in this process rely on motivational interviewing and group dynamics to assist patients in meeting their personal goals. Compared to a paternalist assignment of goals, Whole Health is a longer journey and may be more difficult to accomplish given the short timeframe between indication for surgery and the surgery itself. Since most surgeries will take place regardless of presurgical risk assessment, motivation for change was low. For those surgeries that would be delayed by modifiable risk levels, a Whole Health approach may be more successful.

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Appendix A

Fishbone diagram



Fishbone diagram - prehab

Appendix B

Swim lane flowchart



Appendix C

Personal Healthy Inventory Short Form



U.S. Department of Veterans Affairs

Veterans Health Administration Office of Patient Centered Care and Cultural Transformation

Personal Health Inventory

Use this circle to help you think about your whole health.

- All areas are important and connected.
- The body and mind have strong healing abilities. Improving one area can help other areas.
- The inner ring represents your mission, aspirations, or purpose. Your care focuses on you as a unique person.
- Mindful awareness is being tuned in and present.
- Your self-care and everyday choices make up the green circle.
- The next ring is professional care (tests, medications, supplements, surgeries, examinations, treatments, and counseling). This section includes complementary approaches like acupuncture and yoga.
- The outer ring includes the people and groups who make up your community.

Rate where you feel you are on the scales below from 1-5, with 1 being miserable and 5 being great.







Whole

Health [™]Life ⅔

Approache

Conventional &

Community

Moving the Body

Energy & Flexibility

Mindfu

Me

Awarenes

Recharge

Sleep & Refresh

Surroundings

Physical & Emotional

Food & Drink

Nourishing & Fueling

Personal

Development

Personal Life

& Work Life

Power of the Mind

Relaxing & Healing

Family, Friends

& Coworkers

Relationship

Spirit & Soul

Growing & Connecting

{re}ntion & Treatm{en}

	Life:	How is it to live your day-t	o-day life?	
1 Miserable	2	3	4	5 Great
What is your mission, Write a few words to ca	aspiration, or purpo apture your thoughts:	se? What do you live f	or? What matters m	ost to you?

Where You Are and Where You Would Like to Be

For each area below, consider "Where you are" and "Where you want to be". Write in a number between 1 (low) and 5 (high) that best represents where you are and where you want to be. You do not need to be a "5" in any of the areas now, nor even wish to be a "5" in the future.

Area of Self Care		Where I Want to Be (1-5)
Moving the Body: Our physical, mental, and emotional health are impacted by the amount and kind of movement we do. Moving the body can take many forms such as dancing, walking, gardening, yoga, and exercise.		
Recharge: Our bodies and minds must rest and recharge in order to optimize our health. Getting a good night's rest as well as recharging our mental and physical energy throughout the day are vital to well-being. Taking short breaks or doing something you enjoy or feels good for moments throughout the day are examples of ways to refresh.		
Food and Drink: What we eat and drink can have a huge effect on how we experience life, both physically and mentally. Energy, mood, weight, how long we live, and overall health are all impacted by what and how we choose to eat and drink.		
Personal Development: Our health is impacted by how we choose to spend our time. Aligning our work and personal activities with what really matters to us, or what brings us joy, can have a big effect on our health and outlook on life.		
Family, Friends, and Co-Workers: Our relationships, including those with pets, have as significant an effect on our physical and emotional health as any other factor associated with well-being. Spending more time in relationships that 'fuel' us and less in relationships that 'drain' us is one potential option. Improving our relationship skills or creating new relationships through community activities are other options to consider.		
Spirit and Soul: Connecting with something greater than ourselves may provide a sense of meaning and purpose, peace, or comfort. Connecting and aligning spiritually is very individual and may take the form of religious affiliation, connection to nature, or engaging in things like music or art.		

Surroundings: Our surroundings, both at work and where we live, indoors and out, can affect our health and outlook on life. Changes within our control such as organizing, decluttering, adding a plant or artwork can improve mood and health.	
Power of the Mind: Our thoughts are powerful and can affect our physical, mental, and emotional health. Changing our mindset can aid in healing and coping. Breathing techniques, guided imagery, Tai Chi, yoga, or gratitude can buffer the impact of stress and other emotions.	
Professional Care: "Prevention and Clinical Care" Staying up to date on prevention and understanding your health concerns, care options, treatment plan, and their role in your health.	

Reflections

Now that you have thought about what matters to you in all of these areas, what is your vision of your best possible self? What would your life look like? What kind of activities would you be doing?

Are there any areas you would like to work on? Where might you start?

After completing the Personal Health Inventory, talk to a friend, a family member, your health coach, a peer, or someone on your healthcare team about areas you would like to explore further. IB 10-930 Revised 1/2019 P96814