[Jessica Curcio, PA-C] ISP Application 04/14/2025

Project Lead/Key Contact

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Why are you interested in the Improvement Scholars Program?

I have a passion for enhancing the quality of care we deliver to surgical patients in our healthcare system and am committed to an evidence-based and patient-centered approach to healthcare. When I joined the Division of Vascular Surgery in 2020, I learned about Enhanced Recovery After Surgery (ERAS), which is an evidence-based multi-disciplinary approach to patient care with the goal of improving postsurgical convalescence by optimizing patients before surgery, reducing surgical stress, and encouraging a rapid return to normal activity.[1] I immediately saw the potential benefits of this program, and was eager to become involved. Fortunately, one of the surgical faculty on my team, Dr. Katharine McGinigle, was already engaged with ERAS, and I have had the great fortune of assisting her in the initial steps of building ERAS in vascular surgery here at UNC. Since then, formal ERAS-society endorsed guidelines for lower extremity bypass surgery (along with open aortic surgery and major limb amputation) have been published by Dr. McGinigle.[2–4] My goal is to fully implement the lower extremity guidelines for our patients with peripheral vascular disease who are facing surgery.

Given my dedication to this, I have already begun the initial work of building relationships with the pre-anesthesia testing team, pharmacy, and nursing; creating clinical and pre-op note templates; and building post-op order sets. I have further benefited from the guidance and mentorship of experts in the field, including Dr. McGinigle and Dr. Julie K. Johnson, who share my dedication to quality-driven care here at UNC. They both see the value of having an advanced practice provider who is actively engaged in patient care and working daily with key players to ensure that patients have consistent care and support. The IHQI Scholars program would provide me with additional support to learn and hone the skills needed to more efficiently identify and responsibly remove barriers to implementation and dissemination of this evidenced-based program to improve surgical quality, safety, and efficiency.

Problem Statement: What is the problem you are looking to solve?

Peripheral artery disease (PAD) is an increasingly prevalent condition (affecting at least 15% of adults in the United States) that impairs blood flow to the lower extremities. Because PAD is often the result of years of inadequately controlled medical comorbidities, there is significant variability in comorbidity profiles and cardiac risk for patients who require an operation to restore the blood flow to the legs.[5] Even in clinical trial settings, approximately 50% of the patients undergoing surgical bypass suffered a major adverse limb event (bypass occlusion, repeat vascular surgery, major limb amputation) or death within two years.[6,7] This combination of factors results in complex clinical care with high utilization of resources, prolonged hospitalizations, and rehabilitation needs. ERAS should be able to address the needs of patients undergoing lower extremity bypass surgery.

One facet of ERAS is medical optimization ahead of surgery, and it is clear that ongoing medical comorbidity management is critical to optimizing surgical outcomes and survival in patients with PAD. Despite this, only 50-70% of patients take <u>any</u> cardiovascular risk-reducing medications, and only one third of patients adhere to <u>all</u> medical therapy guidelines, putting them at up to a four-fold risk of major amputation and death.[8] Another facet of ERAS is reducing physiologic stress to facilitate a functional recovery. This is of utmost importance in PAD where it is estimated that less than 15% of patients achieve the ideal surgical result of an uncomplicated bypass, maintenance of ambulatory and domiciliary status, symptom relief, and no re-interventions.[9]

Furthermore, ERAS has the potential to reduce health disparities by standardizing high value, evidence-based care across the board thus minimizing unwarranted care variation based on race/ethnicity or other non-clinical factors.[18] Healthcare inequity is a grave concern in PAD treatment as surgical outcomes and recovery are worse for minorities, particularly Black and Hispanic populations, as compared to white patients.[10,11] Minority populations have higher morality rates, worse limb salvage ourcomes and less access to post operative care and rehabilitation, thus resulting in worse functional outcomes.[12–14] Factors that contribute to this include implicit

bias and lack of culturally competent care.[15–17]

Importance Statement: Why is this project important?

My proposed project is important because our patients here at UNC face the same dismal rates of guideline adherent care at the time of referral, and although our short-term outcomes are in line with national quality metrics, there is significant practice variation between our vascular surgeons, so patients are treated unevenly and with different levels of guideline adherent care over the lifetime management of their chronic vascular disease. Clearly, there is significant room for standardization and improvement in the care of these uniquely high risk patients seeking specialty care at UNCMC. Recognizing this problem plagues many excellent health care systems across the nation, the Society for Vascular Surgery and the Enhanced Recovery After Surgery Society published a 2024 consensus statement on how to best navigate the peri-operative period for patients with PAD who are undergoing lower extremity bypass surgery.[2] This care pathway supports several of UNC organizational health improvement priorities as it promotes equity in health care, aims to reduce hospital length of stay and prevent hospital readmissions, works to reduce morbidity and mortality, all while it promotes an enhanced patient experience. This project prioritizes implementing *and sustaining* these evidence-based guidelines .

Demonstrated by hospitals around the world and embraced by some of our other surgical divisions here at UNC, the innovative, comprehensive strategies for perioperative management guided by ERAS have improved the recovery experience for patients while reducing the costs of delivering care, hospital length of stay, hospital readmissions, and complications.[1,19] Furthermore, standardization of care through ERAS in other academic medical centers has been shown to reduce healthcare inequities and improve outcomes in minority populations. The core tenets of ERAS are: (1) patient education and empowering the patient to be a partner in their care; (2) medical optimization prior to surgery; (3) preemptive non-narcotic analgesia and multimodal postoperative non-narcotic analgesia; (4) avoidance of prolonged fasting and maintenance of euvolemia; (5) early mobilization; and (6) close follow-up. Quality improvement tools embedded in the ERAS protocols allow for sequential improvements in compliance and outcomes.

UNC already has a strong ERAS program in many other surgical specialties along with an operating dashboard reporting ERAS adherence metrics and outcomes. Utilizing the resources of this existing program, I aim to implement a robust ERAS initiative for patients with PAD. While ERAS is a well-known concept among many surgeons, anesthesiologists, and nurses, the concept of ERAS is still emerging in vascular surgery worldwide, and has not been well adopted at all in vascular surgery at UNC. The core tenets mentioned above are variably implemented, and through our M&M process, it has become apparent to me that reducing unwarranted variation in these areas could avoid some of our operative complications.

The problem that I am trying to solve with this proposal is that the 2024 lower extremity bypass guidelines are not consistently part of any UNC surgeon's routine practice. These recommendations include nutritional screening in the outpatient setting and, if malnutrition is identified, providing targeted therapy preoperatively, frailty and dementia risk screening, screening for tobacco use and initiating tobacco cessation treatment, alcohol use screening, fasting criteria pre-op, and recommending carb loading when appropriate. Even the use of preoperative DVT prophylaxis remains inconsistent among vascular surgeons. To transform our peri-operative practices, we need to unite key stake-holders around a shared vision. It is essential that we communicate the urgency of these changes, remove perceived barriers, and foster a culture that prioritizes dynamic improvement, allowing even our most vulnerable patients to thrive.

Project Scope

In Scope:

- *What is the specific patient population your project will impact?* **Patients with peripheral vascular disease undergoing open bypass surgery.**
- *How many patients are in the population?* **PAD effects at least 15% of the adult population in the US, and approximately half of them will require surgery to restore the blood flow to their legs. At UNC, this translates into approximately 50 open surgical bypass operations per year, and another 300 endovascular procedures.**

- *In what setting(s) would this problem be addressed? (e.g., hospital unit, outpatient practice setting, non-clinical setting, etc.)*? **In the outpatient surgical clinic, operating room, and inpatient settings**.

Out of Scope: Non-vascular surgery patients. Patients not undergoing bypass surgery. Patients undergoing endovascular bypass surgery will benefit from the improvement in consistent education, medical optimization and focus on functional outcomes that is provided in the outpatient setting, but will not be part of the full ERAS program that spans the perioperative setting.

Measures: (Process, Balancing, Structure)

Measure Name	Measure Type	Measure Calculation	Measure Exclusion	Data Source	Baseline	Goal	Collection Frequency
ERAS acceptability	ERAS adoption	Leadership team identification				Identify key stakeholders	Bi-weekly
ERAS adoption	Outcome	Recovery time (hospital length of stay) Postoperative complications				To implement ERAS protocols for all patients undergoing lower bypass surgery	
ERAS sustainability							
ERAS Adherence	Process	Patients who achieve 80% of compliance with ERAS elements	Patients who the surgeon determines is not eligible for this component of the protocol	EMR	NA	100% of patients who are eligible will be fully compliant with protocol	Weekly
Patient Safety	Balancing	Inpatient falls				Ensure that early mobilization does not lead to injury.	Weekly

		Unplanned readmissions				Ensure that early discharge does not lead to complications or readmissions	
	Other						

Root Cause Analysis

Prolonged Hospital Stays, readmissions: Lack of concordance with guidelines results in variability in care for patients. Standardization of ERAS protocols across healthcare systems can be difficult due to differences in resources, training, and institutional practices. Further, some healthcare providers may resist adopting ERAS due to unfamiliarity or perceived complexity. This can result in delays in early mobilization due to inadequate pain management. Further, inconsistent patient education, leading to non-compliance with discharge protocols or confusion about recovery expectations can lead to discharge delays, unnecessary ED visits and readmissions.

Ideas for Improvement

Outpatient: Develop standardized discharge planning that begins before surgery and involves all necessary staff. Improve patient education on home recovery protocols and ensure comprehensive post-discharge follow-up.

Inpatient: Standardize pain management protocols and provide staff with additional training on multimodal analgesia. Establish clear discharge criteria and enhance communication between discharge planners, surgical teams, and nursing staff. Implement a clear protocol for early mobilization and ensure physical therapy teams are involved early in the patient's recovery. Provide staff training on motivating patients and assisting with early mobilization. Build a surgical home for vascular surgery patients to ensure consistent, high level nursing care. Create comprehensive order sets that address the key components of ERAS and ensure that all proper orders are placed by the surgical team.

Risks and Opportunities

To foster improvement several factors play critical roles in optimizing the process, reducing complications and enhance outcomes. These factors cross clinical, organizational and patient related components that will improve overall effectiveness and sustainability of the ERAS program

Pre-operative preparation: comprehensive patient education and engagement, optimizing comorbidities. Patient education on the ERAS protocol, the surgical procedure, and the recovery process reduces anxiety, improves compliance, and enhances the likelihood of successful outcomes. Optimizing conditions like diabetes, hypertension, and nutrition before surgery can significantly reduce complications and accelerate recovery.

Standardized protocols: Standardizing the ERAS process ensures that every patient receives optimal care regardless of the healthcare provider or location. Adhering to protocols has been shown to reduce complications, shorten hospital stays, and enhance recovery.

Effective multimodal pain management and early mobilization: Reducing opioid use while maintaining effective pain control leads to faster recovery and fewer side effects. Getting patients moving soon after surgery improves circulation, reduces the risk of blood clots, and promotes faster recovery of muscle strength.

Early discharge planning: Planning for discharge before surgery ensures that patients know what to expect during recovery, reducing anxiety and preparing them for a successful transition home. Engage patients and family in the process early on. Engaging the patient's family or caregivers in the recovery process can improve adherence to the care plan and provide additional support at home, reducing readmission rates.

Implementing an **Enhanced Recovery After Surgery (ERAS)** protocol for **lower extremity bypass surgery** can significantly improve patient outcomes, but it also presents several challenges that need to be anticipated and addressed proactively. Below are the major challenges to anticipate:

Resistance to Change and Lack of Buy-in: Healthcare providers (surgeons, nurses, anesthesiologists) and other stakeholders may be resistant to adopting the ERAS protocol, especially if they are accustomed to traditional postoperative care practices.

Inconsistent Adherence to Protocols: Inconsistent adherence to ERAS protocols among healthcare professionals can lead to variable patient outcomes. This includes issues such as delays in mobilization, poor pain management, or failure to administer preoperative nutritional optimization.

Patient Non-compliance and Expectations; Complications and Comorbidities: Patients may be unfamiliar with ERAS protocols and might not understand the importance of early mobilization, pain management, or nutritional optimization. Patients undergoing lower extremity bypass surgery may have multiple comorbidities such as diabetes, heart disease, or obesity, which can complicate their recovery and affect the implementation of ERAS protocols.

Stakeholders and Project Team Members

Name	Role
Katharine McGinigle, MD MPH Julie Johnson, PhD	*Sponsor(s)*
Jessica Curcio, PA-C	*Team Lead*
Katharine McGingle, MD MPH Julie Johnson, PhD Lavinia Kolarczyk, MD Andrew Lobonc, MD	*Subject Matter Experts*
Luigi Pascarella, MD, Vascular Surgery Jacob Wood, MD, Vascular Surgery William Marston, MD, Vascular Surgery Jennifer Belgum, FNP, Vascular Surgery (APP supervisor) Heather Johnson, DNP, Vascular Surgery Lindsey Gouker, MD Anesthesia Renee Rosiek, FNP, Anesthesia Raquel Rey, ANP, Anesthesia	*Supporters/ steak holders*
???	*Data Lead*
Brittney Killingsworth, RN; Sarah Miller, RN; Anna Lamoreaux, RN (Outpatient Vascular) Susan Hayek, RN (Pre-care)	Vascular Surgery RN's, Inpatient RN, Pre-Care RN
Letrianna Demps-Scott, MSW	Social Worker

Impact on the Quintuple Aim

The implementation of ERAS protocols can positively impact all aspects of the quintuple aim. ERAS protocols promote faster recovery, fewer complications, and better long-term health by focusing on early mobilization, optimal pain management, and nutritional support. This contributes to shorter hospital stays, improved wound healing, and reduced readmission rates. ERAS enhances the patient experience by engaging and empowering the patient preoperatively, reducing anxiety, providing consistent care-plans and predictable recovery process that fosters a sense of autonomy, resulting in a more positive experience throughout their surgical journey. ERAS

enhances the healthcare staff experience by providing standardized protocols that streamline workflows. This results in improved efficiency and could reduce the stress and burnout often associated with complex postoperative care. Further the interdisciplinary nature of ERAS also nurtures a team environment with collaboration between across multiple disciplines that fosters a sense of belonging and importance to all care team members. In terms of health equity, ERAS has the potential to reduce disparities in care by providing standardized, evidence-based interventions that can be applied universally, regardless of a patient's background. The financial benefits of ERAS are substantial, as reduced complications, shorter hospital stays, and fewer readmissions lead to significant cost savings for healthcare systems.

Sustainment Plan

Sustaining improvements in the implementation of an ERAS protocol for lower extremity bypass surgery is critical to ensuring long-term success and better patient outcomes. Because this requires ongoing efforts to maintain high standards, adapt to evolving evidence, and foster continuous improvement we will include this in the department of surgery Pillar 3 quality mission. To sustain improvements in ERAS for lower extremity bypass surgery, continuous education, regular audits, strong leadership, and collaboration across disciplines are essential. By embracing a culture of continuous improvement, staying adaptable to new evidence, and ensuring financial and organizational support, healthcare systems can maintain the benefits of ERAS protocols in the long term, ultimately leading to improved patient outcomes and overall efficiency. Ideas that I propose would be sustainable for future as well include:

Standardized Protocols and Checklists: Standardized protocols and checklists ensure consistency and adherence to ERAS principles across all staff members and patients. These tools serve as reminders and guides to ensure key steps in the ERAS protocol are followed at every stage of the patient journey. This includes utilizing standardized pre-operative clinic templates for patients, preoperative and post operative instructions. It would be ideal if we could develop electronic checklists or digital pathways integrated into the hospital's electronic health record (EHR) system to ensure real-time monitoring of compliance. Also it would be ideal to designate champions or leads within the hospital to oversee protocol implementation and ensure adherence across teams.
Data Monitoring and Continuous Feedback Data monitoring helps to track indicators, such as postoperative complications, length of stay, patient satisfaction, and adherence to ERAS protocols. Continuous feedback loops allow for early identification of issues and enable corrective actions. Ideally we could utilize a tracking system and real- time dashboards to monitor outcomes and compliance rates.
Multidisciplinary ERAS Team Meetings: Multidisciplinary collaboration is essential to the success of ERAS, as it requires coordination between multiple specialties. Fostering a collaborative, patient-centered approach ensures that all team members are aligned in their goals and actions. Hold biannual multidisciplinary team meetings to review patient progress and discuss potential barriers or improvements to the ERAS protocol. We will link these meetings to the currently scheduled bi annual VQI meetings to ensure all stakeholders are present and participating.

Carolina Quality Tools

The Carolina Quality tool of visual management board will be utilized for the project. Our board will clearly will display the problem we are addressing and show our analysis and how we learn from errors and redesign of the system. We will utilize this to drive continuous improvement. In line with ERAS plan – do -act -check philosophy. We will use this to update questions and engage team members, and will incorporate the following key elements:
Current state process map with flow chat- depicting the current dominant process: ex- from clinic-->admission-->discharge-->follow-up
Future state process map- the ideal state for the process: ex- clinic utilizing ERAS pre-op-->admission with ERAS-->discharge with ERAS and then follow up
Strategy Statement : visualization of the key strategic priorities.

References

- Sponsor letters – specifics that leaders agree to.

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