

## Introduction

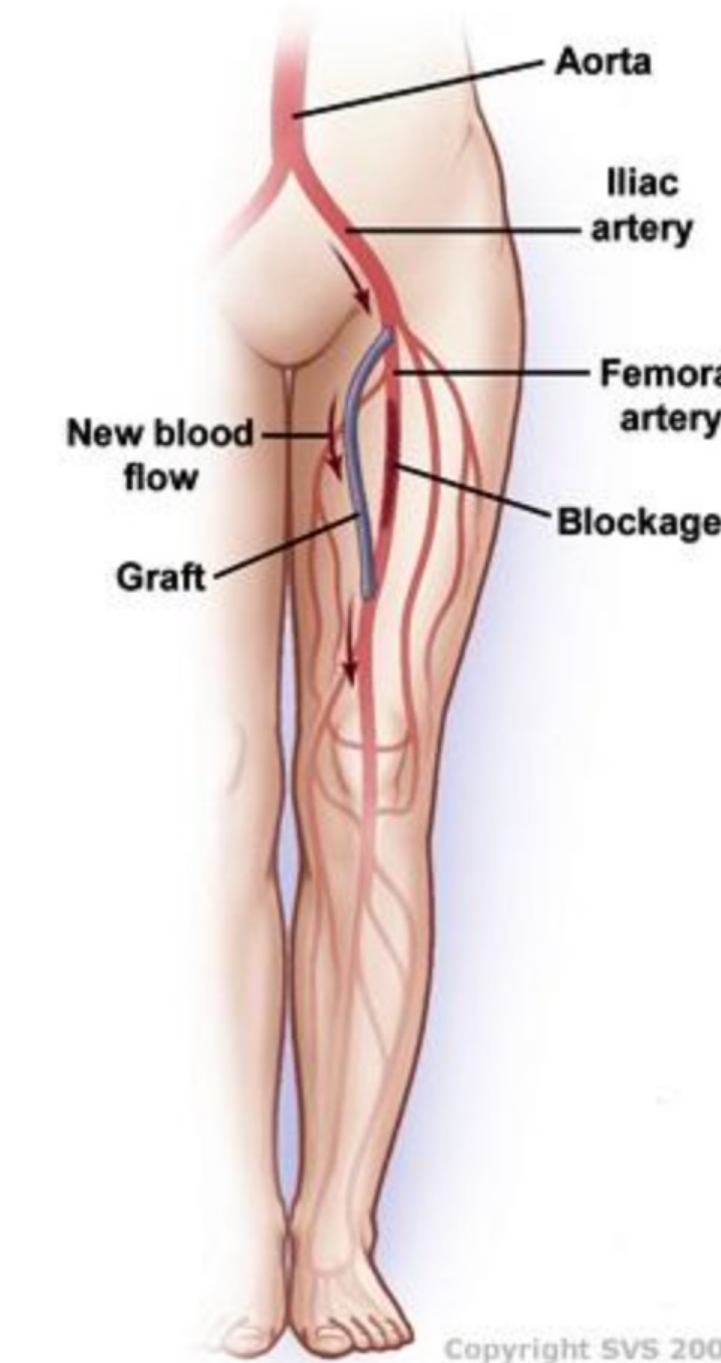
- Frailty, nutritional status, and comorbid conditions are all challenges that contribute to significant morbidity in patients undergoing infrainguinal arterial bypass.<sup>1</sup>
- Evidence supports that enhanced recovery pathways (ERP) can improve perioperative outcomes. However, few studies have demonstrated successful implementation of an ERP for infrainguinal bypass (IB).<sup>2</sup>

### GOAL:

- Demonstrate successful implementation of an ERP in a complex vascular surgery patient population undergoing IB, including elective, urgent, or emergent procedures.

### HYPOTHESIS:

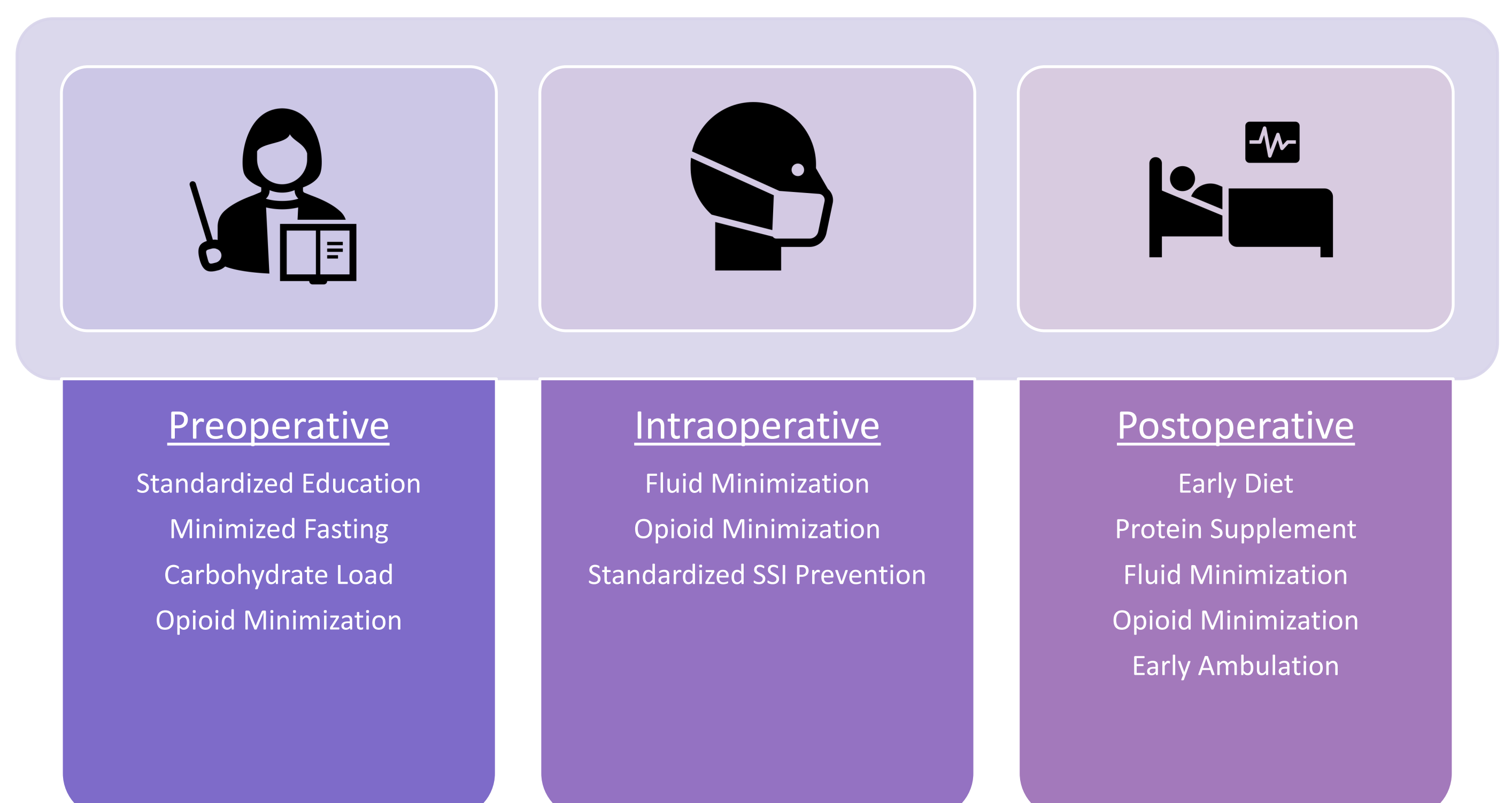
- Implementation of ERP for IB can reduce rates of reoperation, readmission, and postoperative length of stay
- ERP can be successfully implemented not only for standard elective procedures but also in urgent and emergent contexts



## Methods

- The ERP was initiated February 2022 and patients were enrolled at the discretion of the surgeon.
- At one year, patient data and process and outcome measures were abstracted from the medical record and validated by two independent reviewers for univariate analysis for all patients undergoing IB at a single institution.

QUERI model	NM Vascular Surgery ERP
Identify the Problem	<ul style="list-style-type: none"> <li>Review of Vascular Quality Initiative (VQI) outcomes</li> <li>Consideration of annual volume, complexity of care delivery</li> </ul>
Define Best Practices	<ul style="list-style-type: none"> <li>Review of the literature</li> <li>Expert consensus across the system (3 hospitals)</li> </ul>
Implement Interventions	<ul style="list-style-type: none"> <li>System wide Electronic Medical Record (EMR) changes</li> <li>Allow for process variation by site</li> <li>Pilot at single institution</li> </ul>
Document Improved Outcomes	<ul style="list-style-type: none"> <li>Vascular Quality Initiative Registry</li> <li>ERP Dashboard</li> <li>Vizient</li> </ul>
Document Improved Quality of Life	<ul style="list-style-type: none"> <li>Patient reported outcome measures for opioid use, quality of life and disability (NM PRO)</li> </ul>



## Patient Characteristics & Outcome Measures

ERP patients, in comparison to non-ERP patients, were more likely to be outpatient with elective surgical indication

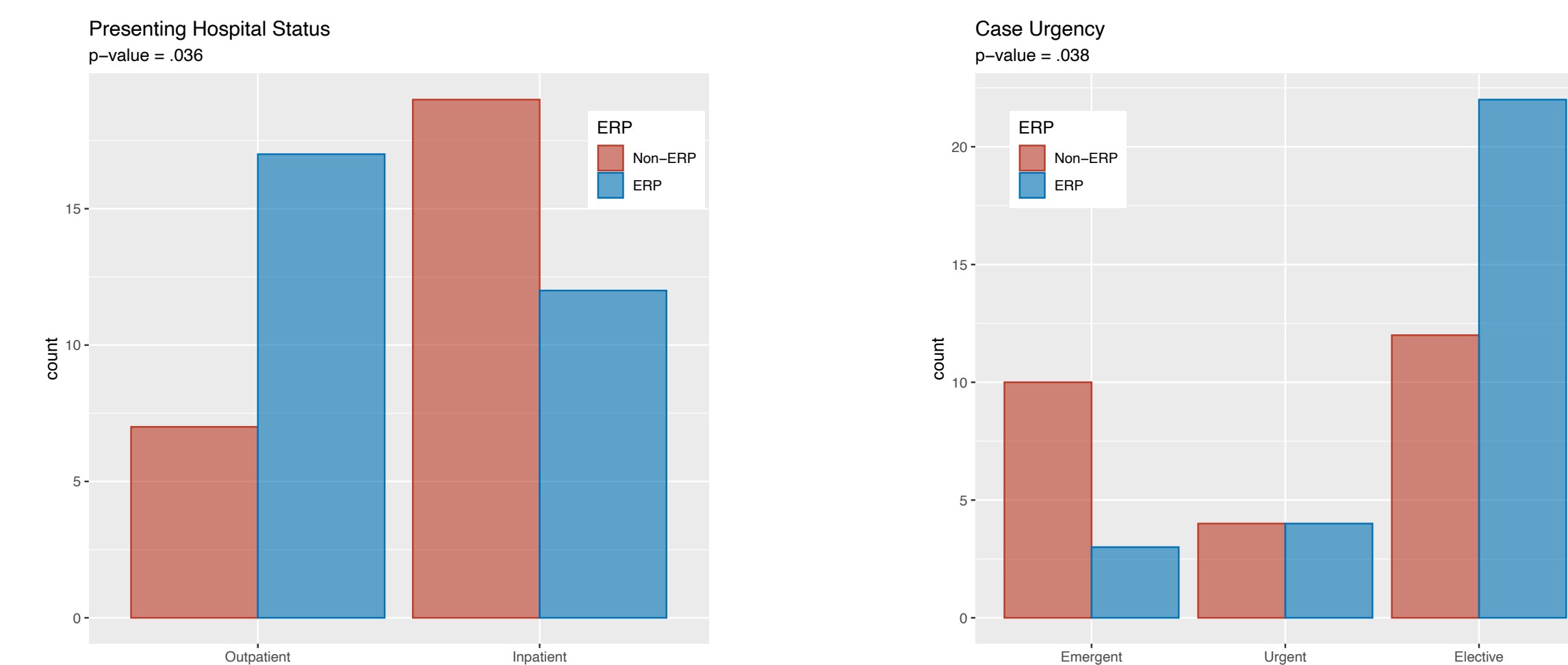


Figure 1: Frequency of presenting hospital status (left). Frequency of presenting case urgency by VQI criteria (right).

ERP patients were more likely to have tissue loss and similarly likely to have an infrageniculate bypass target versus non-ERP patients

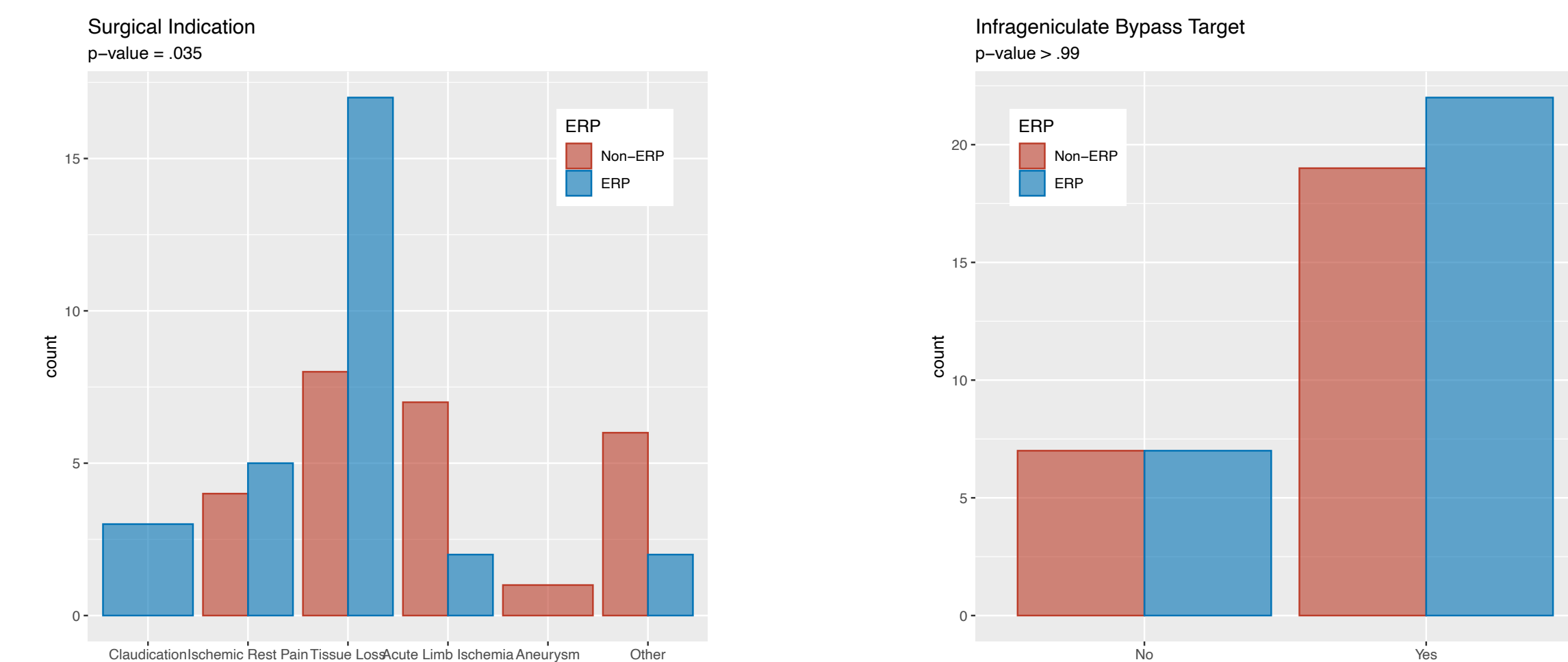


Figure 2: Frequency of each presenting surgical indication (left). Frequency of infrageniculate bypass target (right).

ERP patients trended towards fewer unplanned reoperations and unplanned readmissions versus non-ERP patients

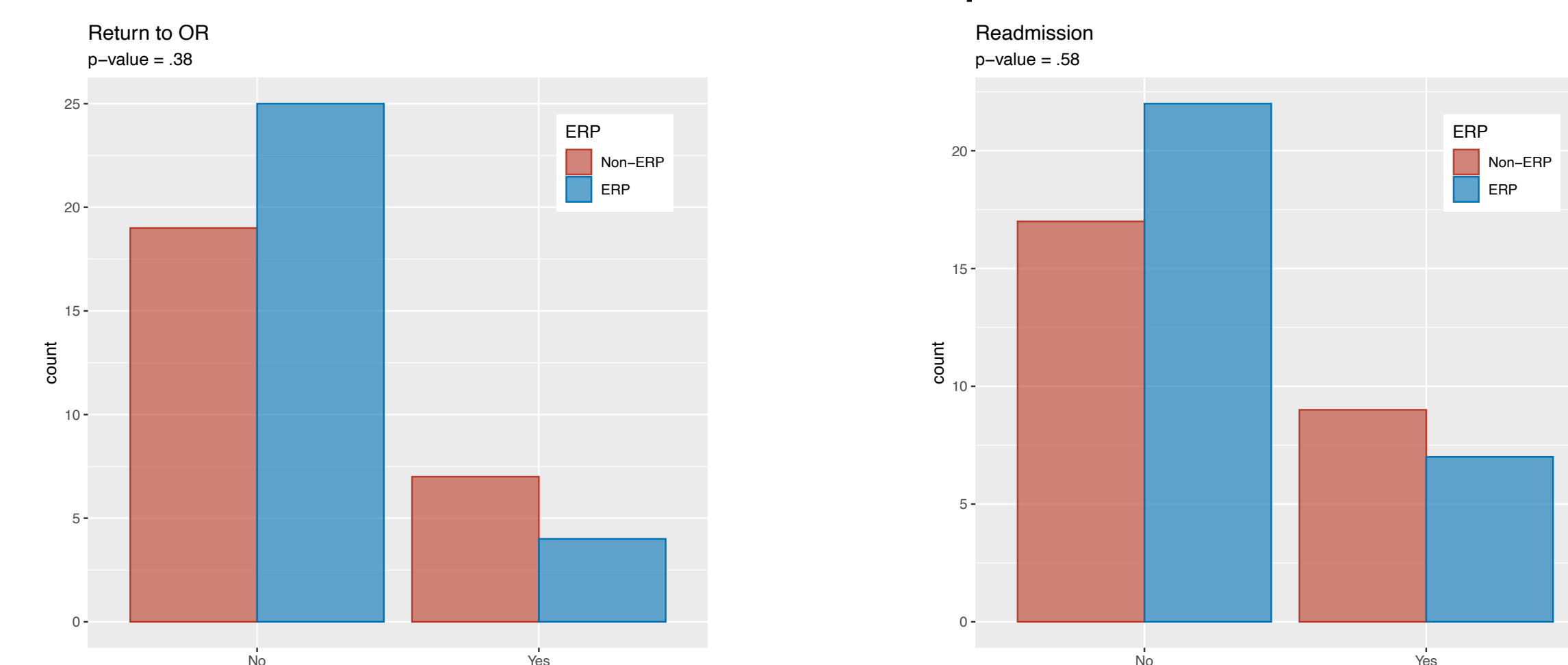


Figure 3: Frequency of unplanned reoperation (left). Frequency of unplanned readmission within 30 days of IB (right).

ERP patients trended towards a shorter postoperative length of stay and total operative time

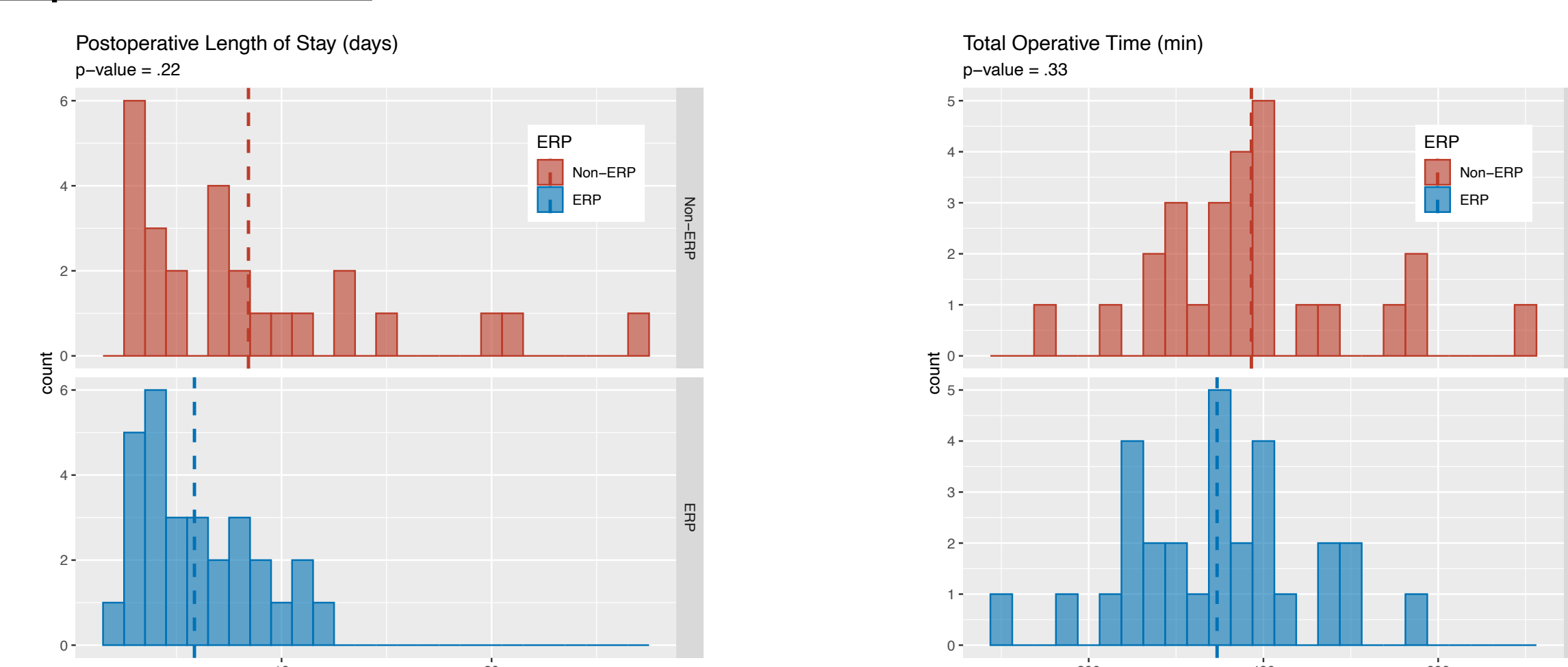


Figure 4: Aggregate of all postoperative length of stays (left). Aggregate of all operative times (right).

## Process Measures

Process Measure	Non-ERP Compliance	ERP Compliance
Standardized Preoperative Education	19.2%	79.3%
Preoperative Chlorhexidine	50.0%	89.7%
Preoperative Opioid Sparing	34.6%	55.2%
Preoperative Carbohydrate Load	7.7%	62.1%
Postoperative Opioid Sparing	96.2%	100%
Postoperative Mobilization	76.9%	86.2%
POD1 Cessation of IVF	84.6%	100%
Postoperative Protein Supplement	23.1%	13.8%
Early Resumption of Liquid Diet	53.8%	75.9%
Early Resumption of Solid Diet	88.5%	100%

## Conclusions

- ERP for All-Comers:** Development and implementation of an ERP for IB is feasible in urgent and emergent settings as well as for more technically challenging infrageniculate bypass targets
- Improved Outcomes:** ERP patients trended towards fewer unplanned reoperations and readmissions
- Shorter Length of Stay:** ERP for IB was associated with decreased postoperative length of stay and total length of stay
- Process Measure Compliance:** Implementation of the ERP was associated with improved compliance with novel and preexisting process measures.

**IMPACT:** Development of an ERP for all-comer IB highlights the potential benefit for PAD patients and the complex vascular surgery population broadly. The inclusion of urgent and emergent indications expands the potential for enhanced recovery pathways for all surgical contexts.

## Acknowledgements & Funding

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## References

- [1] Eslami MH, Saadeddin Z, Rybin DV, Doros G, Siracuse JJ, Farber A. Association of frailty index with perioperative mortality and in-hospital morbidity after elective lower extremity bypass. J Vasc Surg. 2019 Mar;69(3):863-874.e1. doi: 10.1016/j.jvs.2018.07.050. Epub 2018 Oct 24. PMID: 30527215.
- [2] McGinagle KL, Eldrup-Jorgensen J, McCall R, Freeman NL, Pascarella L, Farber MA, Marston WA, Crowner JR. A systematic review of enhanced recovery after surgery for vascular operations. J Vasc Surg. 2019 Aug;70(2):629-640.e1. doi: 10.1016/j.jvs.2019.01.050. Epub 2019 Mar 25. PMID: 30922754.