



A Retrospective Comparison Trial Investigating Aggregate Length of Stay Post-Implementation of Seven Enhanced Recovery After Surgery (ERAS) Protocols between 2015-2022

Andrew R. Locke, BS¹, Noah Ben-Isvy, BS¹, Muneeb S. Hasan, BS¹, Chi Wang, PhD², Matthew J. Belanger, MBA, MHA¹, Mohammed Minhaj, MD, MBA¹, Steven B. Greenberg, MD¹, and Rebecca N. Blumenthal, MD¹

¹Department of Anesthesiology, Critical Care, and Pain Medicine, Endeavor Health, A Teaching Affiliate of the University of Chicago Pritzker School of Medicine, Evanston, IL

²Department of Biostatistics, Endeavor Health, Evanston, IL



Introduction

- ERAS initiatives are important in providing safe care and increasing patient satisfaction in hospital systems. Successful implementation involves collaboration between anesthesiology, surgery, nursing teams, and many other hospital professionals who agree upon and implement a number of perioperative interventions into an evidence-based protocol.

Hypothesis

- Primary: In a multi-center, community-based health system, the aggregate length of stay among seven surgical subspecialties would be significantly reduced after ERAS implementation
- Secondary: ERAS implementation will demonstrate a reduction in hospital pain scores and opioid consumption

Methods

- The ERAS Program launched in 2016 and this analysis includes data from seven protocols: colorectal, ventral hernia, implant-based mastectomy, Cesarean section, open abdominal hysterectomy, prostatectomy, and hepatobiliary
- Patients were included for one year prior to the implementation of each respective protocol for the pre-ERAS cohort. The post-ERAS cohort was collected from July 2021 through June 2022
- Data was collected retrospectively on 2,237 patients, of which 1,324 were included in the matched analysis via propensity scoring. Data collection occurred through a data pull from the electronic data warehouse with outlier confirmation and validation performed via manual chart review

Discussion

- Aggregate hospital length of stay reduced by approximately 1 day in ERAS group
- Reduction in opioid consumption by 50% in ERAS group
- A greater proportion of patients achieved mild vs. moderate or severe pain on POD 0-2 in ERAS group
- This study suggests the success of the implementation of multimodal anesthesia involving non-opioid analgesics, regional nerve blocks combined with a collaborative multidisciplinary approach to perioperative medicine

Conclusion

- This retrospective comparison trial highlights the positive impact of ERAS protocols on patient outcomes across multiple surgical specialties within a community hospital system. Future research should focus on further elucidating the mechanisms underlying the beneficial outcomes of implementing ERAS protocols. Understanding which interventions are the most impactful could allow a more focused design for future ERAS protocols. Finally, qualitative studies investigating patient perspectives and experiences following ERAS protocols could provide valuable insights into the patient-centered benefits of enhanced recovery initiatives.

Results

	Overall (n=1,324)		Pre-ERAS (n=662)	Post-ERAS (n=662)	
	n, (range)	median (IQR)	median (IQR)	median (IQR)	p-value
Primary Outcome					
Length of Stay	n=1324	2.7 (1.1 - 3.9)	3.0 (1.5 - 4.1)	2.1 (1.1 - 3.2)	<.0001
0 to 1		265 (20.0)	116 (17.5)	149 (22.5)	<.0001
1.1 to 3		567 (42.8)	240 (36.3)	327 (49.4)	
3.1 to 5		336 (25.4)	215 (32.5)	121 (18.3)	
5<		156 (11.8)	91 (13.7)	65 (9.8)	
Secondary Outcomes					
Opioid Consumption	n=908	30.0 (10.0 - 84.5)	40.0 (15.0 - 117.5)	20.0 (10.0 - 52.5)	<.0001
Opioids					0.246
No		24 (2.6)	17 (3.2)	7 (1.9)	
Yes		884 (97.4)	522 (96.8)	362 (98.1)	
Max Pain Score POD0	n=1215	7.0 (5.0 - 8.0)	7.0 (5.0 - 8.0)	6.0 (4.0 - 8.0)	<.0001
0 to 3 (mild)		172 (14.2)	62 (9.8)	110 (18.9)	<.0001
4 to 6 (moderate)		417 (34.3)	208 (32.9)	209 (35.8)	
7 to 10 (severe)		626 (51.5)	362 (57.3)	264 (45.3)	
Max Pain Score POD1	n=1230	5.0 (4.0 - 7.0)	6.0 (4.0 - 7.0)	5.0 (3.0 - 7.0)	<.0001
0 to 3 (mild)		270 (22.0)	109 (17.0)	161 (27.4)	<.0001
4 to 6 (moderate)		522 (42.4)	287 (44.6)	235 (40.0)	
7 to 10 (severe)		438 (35.6)	247 (38.4)	191 (32.5)	
Max Pain Score POD2	n=897	5.0 (4.0 - 7.0)	6.0 (4.0 - 7.0)	5.0 (3.0 - 7.0)	0.0004
0 to 3 (mild)		217 (24.2)	88 (18.2)	129 (31.2)	<.0001
4 to 6 (moderate)		387 (43.1)	225 (46.5)	162 (39.2)	
7 to 10 (severe)		293 (32.7)	171 (35.3)	122 (29.5)	

