

Baptist Health

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**What is ERAS?
How To Do It With AAAs and What Are Its
Advantages and Limitations**

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Disclosure

None

Introduction


- **Enhanced Recovery After Surgery (ERAS)** is a peri-operative care pathway designed to achieve early recovery for patients undergoing major surgery
- A significant body of literature across various surgical fields demonstrates improved outcomes with adherence to ERAS recommendations (e.g. orthopedic, colorectal surgery)
- To date, its adoption within vascular surgery has been limited

ERAS Core Elements

| Item # | ERAS Element |
|----------------------|---|
| Preadmission | |
| 1 | preadmission education and counseling |
| 2 | medical and nutritional optimization |
| Preoperative | |
| 3 | minimize extended fasting, carbohydrate loading |
| 4 | avoid preoperative sedatives |
| Perioperative | |
| 5 | prevention of nausea and vomiting |
| 6 | antimicrobial prophylaxis |
| 7 | anesthetic protocol incorporating goal-based fluid strategy |
| Postoperative | |
| 8 | postoperative opioid minimization |
| 9 | early drain and line removal |
| 10 | early mobilization |
| 11 | early resumption of regular diet |

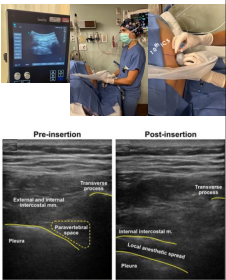
BRRH ERAS-AAA Study

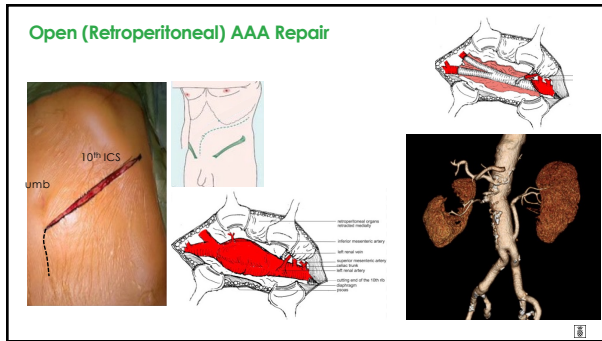
- Single institution, 2013-2023
- ERAS protocol with multimodal anesthesia (paravertebral block) implemented in 2021 for patients undergoing open AAA repair
- **Primary outcomes:** length of stay (LOS) and 30-day mortality
- **Secondary outcomes:** 30-day readmission, major complications, postoperative opioid consumption, and hospital cost
- 241 patients: PreERAS 161 vs. ERAS 80
- Propensity score matching analysis



Paravertebral Block

- Performed in Preop Holding
- Right lateral decubitus
- 10th ICS identified by U/S and marked
- Paravertebral space identified using curvilinear transducer
- 19G epidural catheter placed 3cm into PV space
- Test dose: 3ml of 1.5% lidocaine w/ epi (1:200,000)
- Prior to incision: 0.5% bupivacaine 10ml bolus
- ICU: continuous infusion 0.2% ropivacaine @ 10ml/hr





Results: Demographics

| | Propensity Score Matched | | p |
|--------------------------|--------------------------|-----------------|------|
| | ERAS (n=80) | Pre-ERAS (n=80) | |
| Age | 73.9 (8.7) | 73.9 (8.3) | 0.97 |
| Male | 80.0% | 72.5% | 0.27 |
| BMI (kg/m ²) | 27.1 (5.5) | 26.9 (4.1) | 0.81 |
| Suprarenal cross-clamp | 76.3% | 88.7% | 0.04 |
| Frailty Score | 3.1 (1.3) | 3.3 (1.1) | 0.80 |
| Aneurysm size | 59.5 (16.5) | 62.0 (12.0) | 0.02 |
| VCI score | 2.9 (6.4) | 4.9 (11.5) | 0.13 |

Outcomes

| | Propensity Score Matched | | p |
|--|--------------------------|-----------------|--------|
| | ERAS (n=80) | PreERAS (n=80) | |
| Length of stay (days) | 3.0 (1.5) | 6.0 (2.5) | <0.001 |
| Opioid consumption (MME ¹) | 23.5 (38.1) | 55.7 (51.0) | <0.001 |
| Hospital cost (\$) | 10,782 (10,284) | 14,291 (12,269) | <0.001 |
| Any complications | 11.3% | 23.8% | 0.04 |
| 30-day/in-hospital mortality | 5.0% | 8.8% | 0.35 |
| Readmission | 7.9% | 14.9% | 0.18 |

*1 MME = 1.0 mg hydrocodone PO, 0.8 mg oxycodone PO, 10 mg tramadol PO, 0.08 mg hydromorphone IV/SO, 6 mcg fentanyl IV, 0.4 mg morphine IV

- ### Conclusion
- ERAS with multimodal anesthesia for open AAA repair demonstrates significant benefits
 - > 3 day reduction in hospital stay (w/o increase in non-home discharges)
 - >50% reduction in opioid use
 - >50% reduction in complications
 - >25% reduction in hospital cost
 - Our study demonstrates similar benefits seen in other ERAS programs, and broader application should be considered in institutions that perform a high volume of open aortic repairs