Perioperative Medicine Summit

Evidence Based Perioperative Medical Care

Nuts and Bolts of Enhanced Recovery After Surgery (ERAS): The Colorectal Experience

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Disclosures

- None

Objectives

- Outline ERAS pathway for Colorectal patients
- Identify challenges in creating and implementing ERAS
- Highlight outcomes of ERAS

What are the goals of ERAS?

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A. Early return bowel function
B. Increased readmission rates
C. More complications
D. Increased patient stress

Who is a part of the ERAS team?

A. Surgeons
B. Anesthesiologists
C. Nurses
D. All of the above

Which of the following drugs is used as part of opioid sparing analegsia in ERAS?

A. Acetaminophen
B. Oxycodone
C. Tramadol
D. Fentanyl

What is Enhanced Recovery after Surgery (ERAS)?

- Multimodal and multidisciplinary program
- Optimize perioperative care
- For colorectal patients undergoing elective surgery

ERAS Goals

- Reduce physiologic stress
- Early return of bowel function
- Improve outcomes: reduce complications and readmissions, decreased length of stay
- Overall better patient care !

Evidence based care

Evidence-Based Surgical Care and the Evolution of Fast-Track Surgery

Henrik Kehlet, MD, PhD, and Douglas W. Wilmore, MD†*

Enhanced recovery programmes and colorectal surgery: does the laparoscope confer additional advantages?

S. Khan, M. Gatt and J. MacFie

The enhanced recovery after surgery (ERAS) pathway for patients undergoing major elective open colorectal surgery: A meta-analysis of randomized controlled trials☆

Krishna K. Varadhan[a], Keith R. Ne
Olle Ljungqvist[e], Dileep N. Lobo[a,

Enhanced recovery after surgery: A consensus review of clinical care for patients undergoing colonic resection

K.C.H. Fearon[a,*], O. Ljungqvist[b], M. Von Meyenfeldt[c], A. Revhaug[d], C.H.C. Dejong[c], K. Lassen[d], J. Nygren[b], J. Hausel[b], M. Soop[b], J. Andersen[e], H. Kehlet[e,f]

Enhanced recovery in colorectal resections: a systematic review and meta-analysis[1]

C. J. Walter*, J. Collin†, J. C. Dumville‡, P. J. Drew§ and J. R. Monson*

Our Dedicated ERAS Team

- Surgeons
- Anesthesiologists
- Clinic staff
- OR staff
- Floor Nursing
- Dieticians
- Pharmacists
- Case managers
- Physical therapists
- Clinical resource manager

ERAS Key Components

Preoperative	Patient education Nutritional screening Bowel preparation Preoperative carbohydrate drink No fasting
Intraoperative	Preop Alvimopan, Pregabalin Epidural anesthesia, TAP block Minimally invasive surgery Avoid fluid excess Glycemic monitoring Normothermia
Postoperative	Opioid sparing analgesia Early oral intake Early mobilization Stimulation of gut motility (gum) Discharge planning

Preoperative education

Patient Information

Enhanced Recovery
After Bowel Surgery:
What You Need to Know

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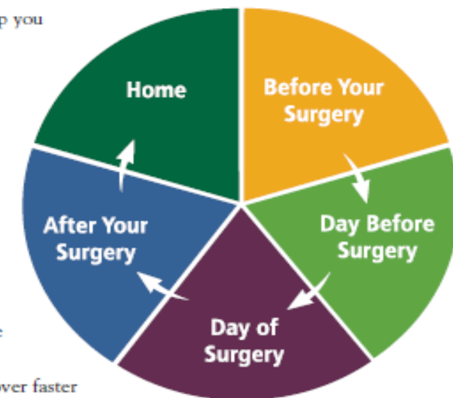
What is Enhanced Recovery?

When you are admitted to the hospital for bowel surgery, you will be part of a recovery program called Enhanced Recovery After Surgery.

The goal of this program is to help you recover quickly and safely and to support you during all phases of this process. Your health care team worked together to create this pathway.



This booklet will:

- Help you understand and prepare for your surgery
- Explain how you can play an active part in your recovery
- Give you daily goals to achieve

Research shows that you will recover faster if you do the things explained in this booklet. There are instructions about eating and drinking, physical activity, and controlling your pain. These things will help you to feel better faster and go home sooner.

Please bring this booklet with you on the day of surgery. Use it as a guide during your hospital stay. Hospital staff may refer to it as you recover, and review it with you when you go home.

Having surgery can be stressful for patients and their families. The good news is that you are not alone. We will support you each step of the way.

Please ask us if you have questions about your care.

Your Rush Colorectal Surgery team

Standardized order sets

Colon/Small Bowel (Open and Laparoscopic) Surgery Pre

Enhanced Recovery After Surgery (ERAS) Panel Order - Panel includes orders specific to ERAS

☐ Enhanced Recovery After Surgery (ERAS) Panel Order

- ☑ NPO for Surgery
- ☑ pregabalin (LYRICA) capsule
- ☑ alvimopan (ENTEREG) capsule.
- ☑ heparin 5000 units/0.5 mL subcutaneous
- ☑ acetaminophen (OFIRMEV) 1,000 mg/100 mL (10 mg/mL) IV infusion

No preoperative fasting

- Lack of evidence- NPO does not guarantee empty stomach
- Modern fasting guidelines
    - Ljungqvist & Soreide, Br J Surg 2003, Cochrane review 2003
- Clear fluids until 3 hours prior to surgery
    - Nygren et al, 1995

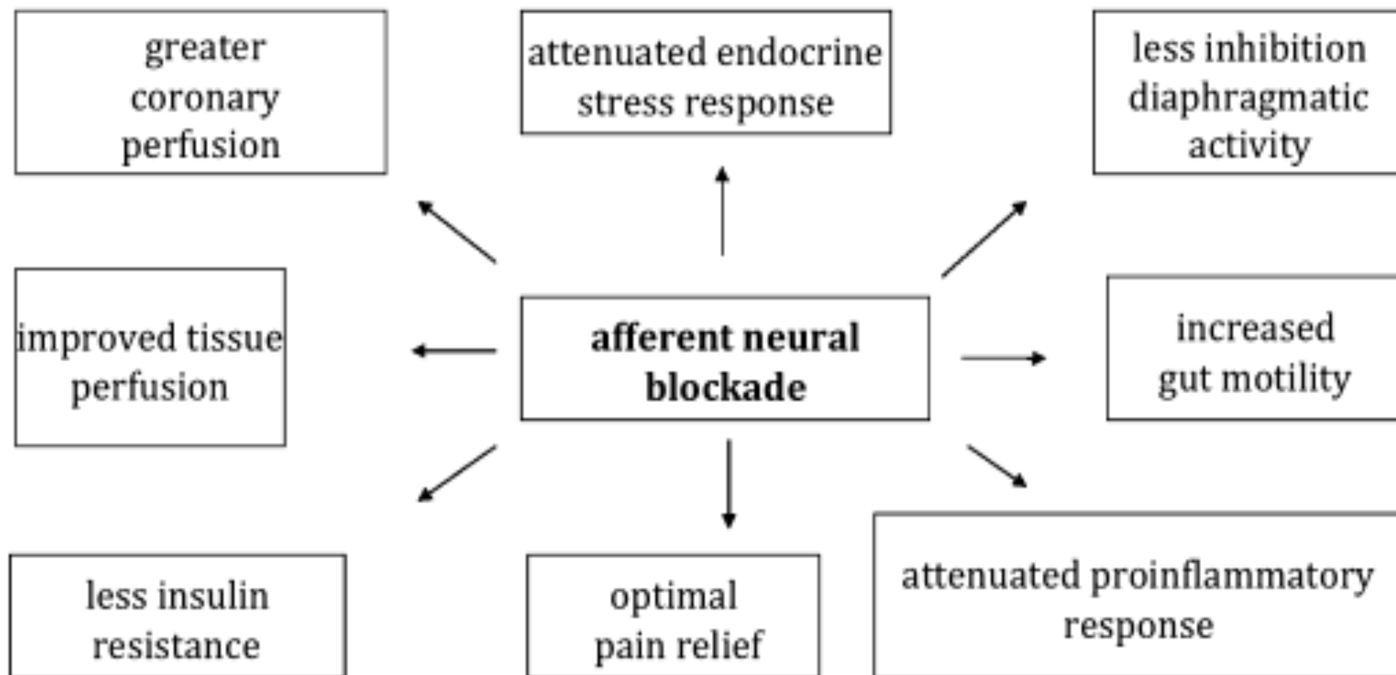
Carbohydrate loading

Pre-operative oral carbohydrate loading in colorectal surgery: a randomized controlled trial

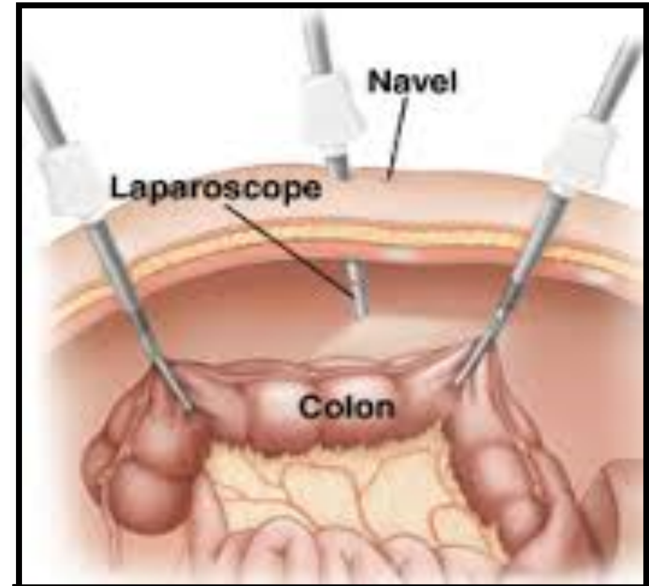
S. E. Noblett, D. S. Watson, H. Huong, B. Davison, P. J. Hainsworth and A. F. Horgan

- Reduces metabolic stress of surgery
- Reduces insulin resistance
- Improves postoperative muscle function
- Reduce lean body mass losses faster

Epidural anesthesia



Use of laparoscopy

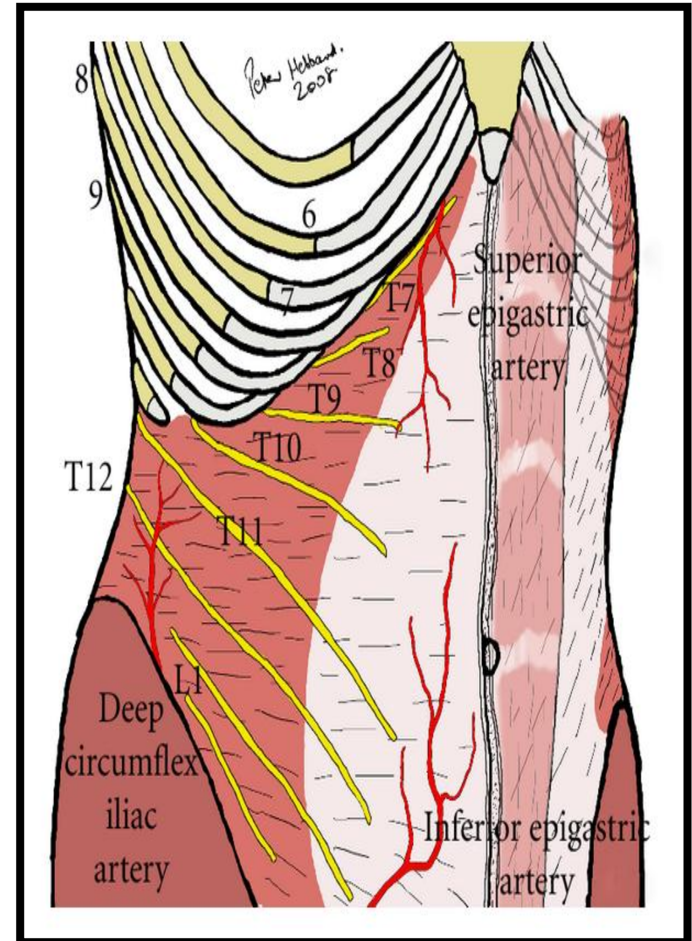


- Decreased complications
  - Wound (open 2%, lap 1%)
  - Pulmonary (open 6.2%, lap 2.5 %)
  - Cardiovascular (open 2.4%, lap 0.7%)
- Less Mortality (open 2.5%, lap 0.3%)
- Decreased LOS (open 9.3, lap 5.7)

Guller et al, 2003 (open 17735; lap 709)

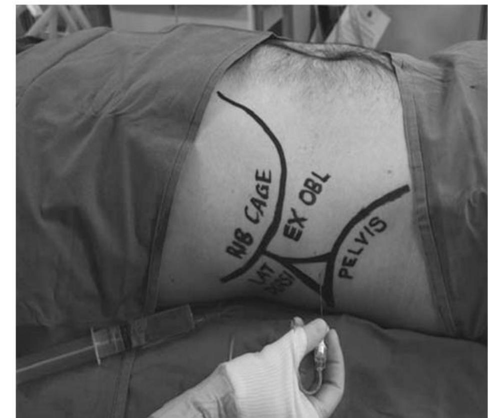
Tranversus abdominis plane (TAP) block

- Injection of local between internal oblique and transversus abdominis muscles
- Infiltrated nerves between T8-L1
- Laparoscopic guidance



TAP block Results

- Fewer narcotics postoperatively than controls (morphine equivalents, 31.08 vs. 85.41; $p = 0.01$)
  - Favuzza, Surg Endoscopy 2013
- Less analgesic consumption and requirement
- Decreased length of stay after lap colectomy, without increasing complications or readmissions
  - Favuzza, J Am Coll Surg 2013



Postoperative care

- Avoidance of opioids
  - Epidural
  - Scheduled Acetaminophen and Ketorolac/Ibuprofen
  - Pregabalin : reduce pain and opioid consumption
- Avoidance of postoperative nausea
  - Mu opioid receptor antagonist (Alvimopan)
    - Decrease LOS and cost

Gum chewing

- Promotes GI motility & gastric emptying
    - Poulton et al, Ped Anaesth, 2012
- Earlier return of bowel function, reduction in ileus
    - Fitzgerald et al, World J Surg, 2009

Postoperative care

- Early
  - Mobilization
  - Oral intake
  - Catheter removal
- Limit
  - Narcotics
  - Drains
  - IV
- Early Discharge planning

ERAS Challenges

- Patient education and compliance
  - Education handbook, nursing
- Anesthesia
  - Epidural use, NPO status
- Surgeon compliance
  - Order sets
- Gathering data/outcomes
  - EPIC spreadsheet

ERAS Outcomes

Measure	Performance
ERAS Case Volume	144
High Risk	45%
Open (%)	40%
Total Fluids	2,362
Avg of Volume Per Hour	627
MME	18
% of Tap Block for Lap Cases	32%
OR Time	4.28
% of Patients with Antiemetics Given within first 72 hours	38%
Average # of Antiemetics Given within first 72 hours	1.97
Average Volume of Postop Fluids within first 72 hours	3,968
Oral Intake on POD 0 (%)	67%
Solid Intake on POD 1	39%

ERAS Outcomes- 1st 6 months

Patients included had undergone elective colorectal surgery by colorectal surgeon between January 1, 2013 and November 30, 2014 (non-ERAS group) or between January 1, 2015 and June 30, 2015 (ERAS group).

	ERAS (n=77)	Non-ERAS (n=256)
Length of stay (LOS)	**4.4 days**	6.6 days

*Significant at p = 0.00005.

ERAS Outcomes-Infections/readmissions

	Superficial SSI*		Organ Space SSI*		Readmitted	
	Yes	No	Yes	No	Yes	No
ERAS	**0**	**77**	**2 (2.6%)**	**75**	**7 (9%)**	**70**
non-ERAS	20 (8%)	236	35 (13.7%)	221	45 (17.6%)	211

*Significant at p = 0.006

ERAS Outcomes- Total direct hospital costs

	Minimum	Median	Mean	Maximum	Standard Deviation
ERAS	**$3,855**	**$9,478**	**$10,080**	**$25,290**	**$4,209**
non-ERAS	$5,290	$12,310	$15,770	$74,770	$9,906

*Significant at p = 0.000007

ERAS Patient satisfaction

20 patients from 1st 6 months contacted:

- 100% reported team made sure they were physically comfortable or had enough pain relief after surgery.
- 85% felt well-prepared to return home after surgery.
- 100% said team got back to them quickly after they were discharged.
- Using number from 0 to 10, (0= extremely difficult recovery, 10= best possible recovery):
  - average- 8
  - median- 9

Colorectal ERAS

- Multimodal perioperative care pathway
- Dedicated team
- Protocol driven
- Improving outcomes
    - Reduction in LOS & complications

Colorectal ERAS: Safe & effective!

Many thanks to Colorectal ERAS team!

- Alison Audet, RN Case Manager 9 North Atrium, Case Management Department
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