Colorectal Surgery (Dr. Rentea) ERAS: Enhanced Recovery After Surgery

**Abbreviations (laboratory and radiology studies excluded):**
- ERAS = Enhanced recovery after surgery
- PAT = pre-admission testing
- SDS = same day surgery

**Inclusion criteria:**
- Colostomy
- Ileostomy
- Laparotomy
- Colon resection
- MACE/appendicostomy
- Posterior sagittal anorectoplasty (PSARP)
- Posterior sagittal anorectal vaginal urethral plasty (PSARVUP)

**Exclusion criteria:**
- Intensive Care Nursery (ICN) patients

**Medication/Diet Instructions received (at Surgery Clinic and/or PAT):**
- **Medication:**
  - Patient takes all normal daily medications night prior to surgery unless specifically instructed to stop
- **Diet:**
  - Standard NPO guidelines
  - 2-3 hrs prior to surgery: Carbohydrate-rich drink: Gatorade, Powerade, or Pedialyte
- **Arrival time/location**

**Prior to surgery day**

- Patient scheduled for colorectal surgery
- Patient seen in either Colorectal Surgery Clinic or PAT for pre-surgery evaluation to review the following:
  - Pain management and regional anesthesia
  - Bowel program regimen night before surgery
  - ClearCarb diet plan
  - Medication instructions
  - Discuss anesthesia risks and plan (including mitigation of pre-op anxiety)
  - Pre-op Colorectal Surgery ERAS checklist
  - Colorectal Surgery ERAS pathway

48 hours prior to surgery date, SDS calls caregiver

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**Objective of ERAS Model**

The objectives for the Colorectal Surgery ERAS pathway are to minimize the variation of care for the patient undergoing colorectal surgery starting with the pre-admission testing visit through hospital discharge. This includes preoperative nutrition/metabolism optimization, decreasing adverse medication side effects such as opiate induced ileus and PONV, promotion of earlier return of bowel function, improving wound and anastomotic healing, and reducing overall hospitalization length of stay. In the last several decades the application of ERAS principles has shown significant improvements in various surgeries regarding length of stay, opioid use, pain control, and return to diet (Fearon 2005, Thiele 2014, Liu 2017).

**Background**

Pediatric colorectal surgical patients with complex anatomy have historically undergone lengthy complex surgery with preoperative bowel preparation, long intra-operative multidisciplinary cases, and lengthy time to oral intake initiation, all in the setting of underlying anatomic and physiologic complexity (for example VACTERL association). Pediatric surgical patients undergoing complex colorectal and pelvic reconstruction require collaborative multidisciplinary perioperative management to ensure the best outcomes. The creation of an Enhanced Recovery After Surgery (ERAS) protocol, implemented to standardize perioperative care to accelerate recovery for colorectal surgery patients is aimed to reduce opioid utilization, improve compliance with infection prevention/wound healing/adverse drug related side effect strategies, expedite the resumption of oral intake and return of bowel function, and reduce the length of hospitalization.

**Target Users**

Anesthesiologists, Colorectal Surgeons (Dr. Rebecca Rentea), Colorectal nurses

**Target Population**

**ERAS Surgical Procedure Inclusion Criteria**

- Colostomy
- Ileostomy
- Laparotomy
- Colon resection
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**ERAS Exclusion Criteria**

- Intensive Care Nursery (ICN) patients

**Core Principles of ERAS** (Melnyk et al., 2011)

- Preoperative education of patients and family with an introduction to ERAS
- Reduced pre-operative fasting, with clear liquid oral carbohydrate loading until 2 hours prior to surgery
- Goal-directed strict intraoperative intravenous fluid therapy guidelines to avoid hypo- or hypervolemia
- Avoidance of pre-operative mechanical bowel preparation
- Avoidance of routine nasogastric tube use
- Minimizing long-acting opioid analgesia, in favor of regional anesthesia with epidural and/or local anesthesia for intra-operative and postoperative pain control when appropriate and using alternative non-opioid medications when appropriate (e.g., non-steroidal anti-inflammatories or acetaminophen)
- Early post-operative mobilization
- Early post-operative enteral feeding

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ERAS Management Recommendations:  

**Pre-Operative Care**
- The beginning of this ERAS protocol begins well before the surgical date. The concept of ERAS is presented to the patient/family at the initial surgical appointment, pre-operative clinic visit, and then reinforced if there is a pre-anesthesia testing (PAT) clinic visit.
- At PAT there are educational items discussed including pre-op diet restrictions, medication management, and the risks of anesthesia.
- Also discussed are some of the core concepts of ERAS, including the emphasis on early post-op PO intake and a multimodal pain management approach. Expectation management is crucial in the preoperative phase. Two handouts (Appendices A and B), approved by the Health Literacy, are given to the family prior to departing PAT.
- Patients are contacted 48 hours prior to the procedure to review arrival time and answer any questions.
- On the morning of surgery, the patient drinks carbohydrate rich liquids up to two hours before surgery start time.

**Intra-Operative Care**
The principal goals during the intraoperative care of these patients are:
- Utilize regional anesthesia when applicable:
  - Transverse abdominal plane (TAP blocks) for colostomy closures or ileostomy closures
  - Have surgeon inject local at incision site if regional anesthesia isn’t performed
- Maintain normothermia during the entire procedure
- Ensure that antibiotics are administered prior to surgical incision
- Eliminate or minimize the use of opioids
- Multimodal pain management including IV acetaminophen and ketorolac
- Post-operative nausea and vomiting prophylaxis with dexamethasone and ondansetron
- Maintain euvoelemia with an emphasis on not administering excess IV fluids

**Post-Operative Care**
The principal goals during the postoperative care of these patients are:
- Prevent/treat post-operative nausea and vomiting; avoid nasogastric (NG) tube
- Multimodal pain control with long-acting opioids as the last option
- Move towards PO intake as early as possible
- Early mobilization if patient is a candidate
- Focus on early discharge from hospital with individualized home instructions

**Additional Questions Posed by the ERAS Committee**
No clinical questions were posed for this review.

**Key Metrics to Be Monitored:**

<table>
<thead>
<tr>
<th>Pre-Op</th>
<th>Intra-Op</th>
<th>Post-Op</th>
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<tr>
<td>Carb-rich drink</td>
<td>Dexamethasone/ Ondansetron</td>
<td>Acetaminophen</td>
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<td>Regional Anesthesia</td>
<td>Ketorolac</td>
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<td>Euvolemia</td>
<td>Avoidance of Long-Acting Opioids</td>
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<tr>
<td></td>
<td>Antibiotics administered prior to incision</td>
<td>Normothermia</td>
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**Potential Cost Implications**
The following potential improvements may reduce costs and resource utilization for healthcare facilities and reduce healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families.

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Version History

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<th>Date</th>
<th>Comments</th>
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<tr>
<td>July 2022</td>
<td>First version completed and implemented</td>
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Disclaimer

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References


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**Appendix A**

### ERAS program helps to:

- **Promote overall healing from surgery**
- **Decrease opioid pain medicine use and side effects by using regional anesthesia**
- **Advance diet faster and speed up return of bowel function**
- **Decrease length of hospitalization**

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**SURGERY**

My child’s colon surgery starts at ______ on ___________.
You will receive a call between 3pm and 7pm the night before surgery with more instructions on eating and drinking when to arrive, and where to go.

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**BOWEL ROUTINE**

Give your child MiraLAX to help soften the stool the day before surgery.
If your child is younger than 2 years old, give:
- 1 capful of MiraLAX mixed in 16 ounces of Pedialyte in the am
- 1 capful of MiraLAX mixed in 16 ounces of Pedialyte in the pm
If your child is 2 years and older, give:
- 2 capfuls of MiraLAX mixed in 16 ounces of Pedialyte in the am
- 2 capfuls of MiraLAX mixed in 16 ounces of Pedialyte in the pm

*Already following an enema regimen? Your team will let you know if your child will continue this the night before surgery.*

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**CLEAR CARB**

Choose a clear, carbohydrate-rich drink like Gatorade or Pedialyte for your child to drink 2-3 hours before surgery.
Try to have them drink about 12 oz. before surgery.
They must finish drinking it no later than 2 hours before the surgery time.

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**QUESTIONS**

We are here to help with your questions before surgery.
For surgery questions, call the Colorectal Center: (816) 234-3199
For anesthesia questions, call the PAT Clinic: (816) 802-1238

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