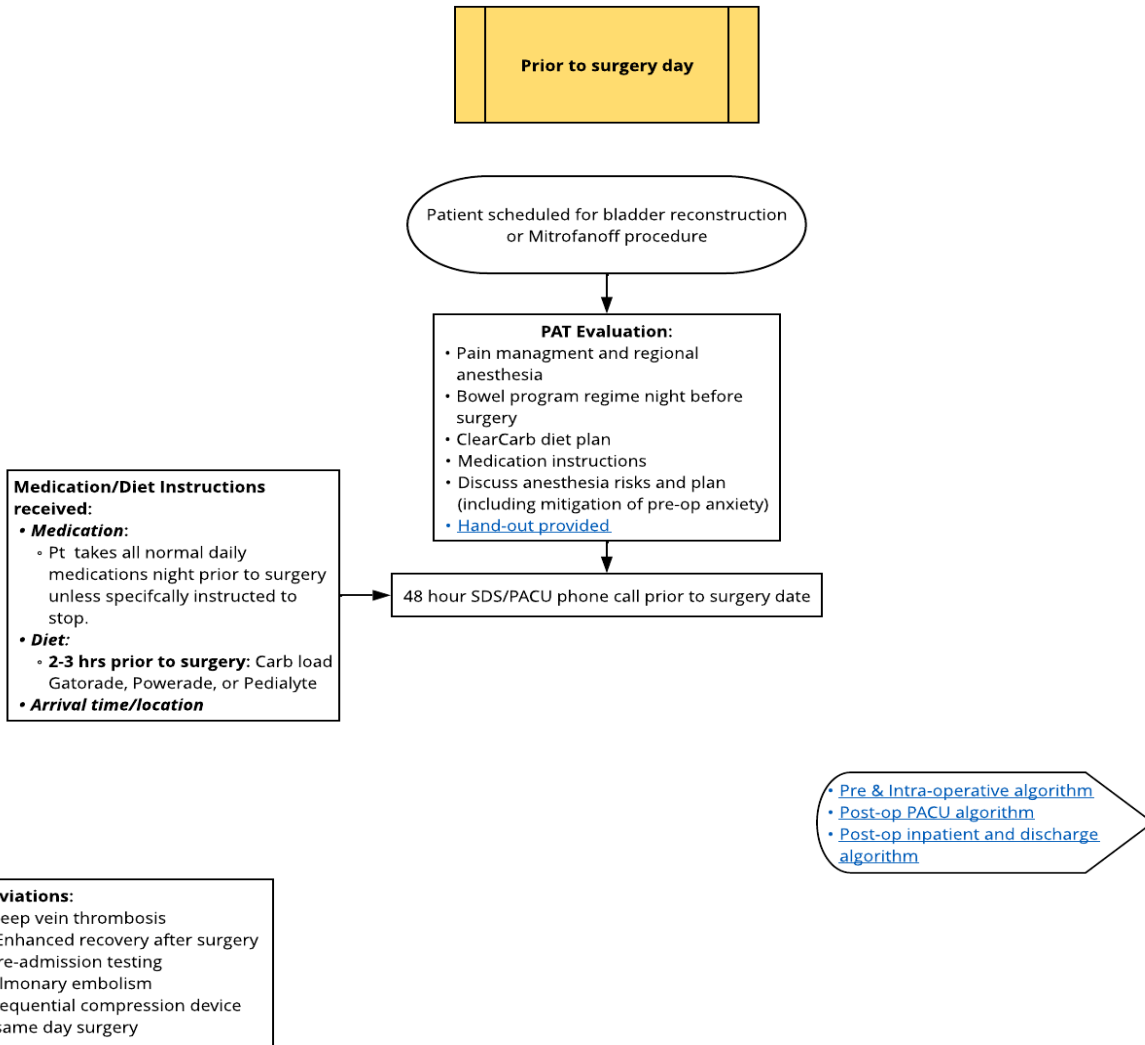




Bladder Reconstruction and Mitrofanoffs Enhanced Recovery After Surgery Pathway Synopsis

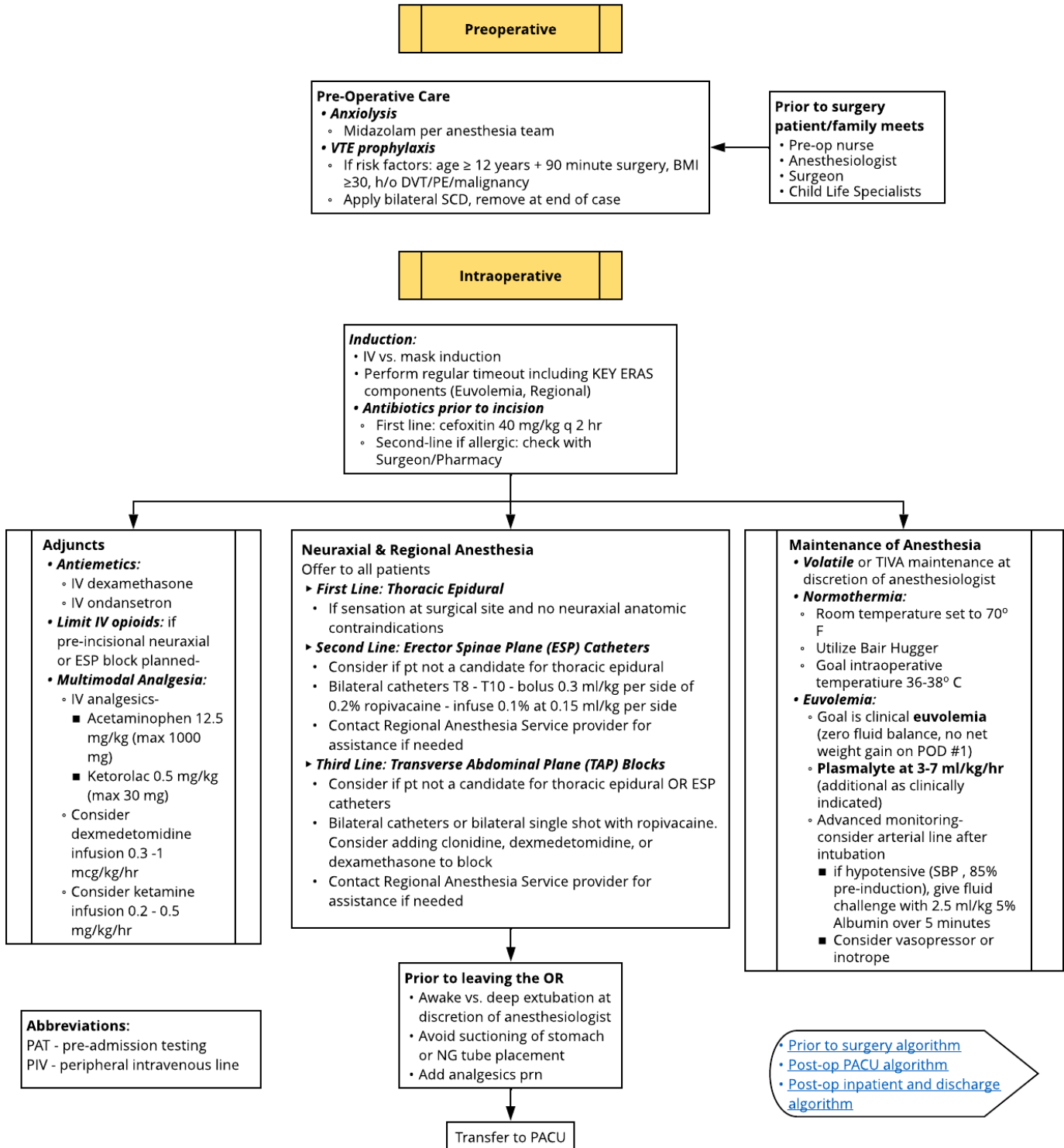
Prior to Surgery



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Pre- and Intra-operative algorithm



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Postoperative: PACU algorithm

Postoperative - PACU

PACU order sets/reminders

- Consult Acute Pain Service for assistance writing epidural/ESP catheter orders
- Avoid PCA
- Minimize narcotics
- Administer ABX if indicated
- Set-up maintenance IV Fluids

Postoperative Pain Management by Pain Team

- ▶ **Continue Epidural/ESP catheters/TAP catheters** until return of bowel function and tolerating normal diet
- ▶ **IV/PO analgesics**
 - Acetaminophen 15 mg/kg PO q6 hr x 72 hrs scheduled (max 15 mg per dose)
 - NSAIDs
 - Ketorolac 0.5 mg/kg IV q6 hr x 72 hrs scheduled (max 15 mg per dose)
 - Ibuprofen 10 mg/kg PO q 8 hr scheduled, once taking PO and off ketorolac
 - Consider ketamine infusion
 - Consider dexmedetomidine infusion
 - Consider clonidine prn (if not in epidural)
 - Opioids: IV opioid only for breakthrough on POD #0-1 and/or not tolerating a diet
 - Hydromorphone 5 - 10 mcg/kg q 2 hr prn
 - Oxycodone 0.1 - 0.2 mg/kg PO q 3 hr prn
- ▶ **Last line: Hydromorphone PCA**

PACU/anesthesia discharge criteria

- Pain managed
- Pt can maintain airway on their own
- Vital signs stable

Does patient meet PACU/anesthesia discharge criteria?

Consult with anesthesiologist for disposition

Transfer to Inpatient Unit

Abbreviations:

- ABX- antibiotics
- ESP - erector spinae plane
- IV Fluids-intravenous fluids
- NSAIDs - nonsteroidal anti-inflammatory drugs
- PACU - post anesthesia care unit
- PCA - patient controlled analgesia
- POD - postoperative day
- TAP - transverse abdominal plane

• [Prior to surgery algorithm](#)

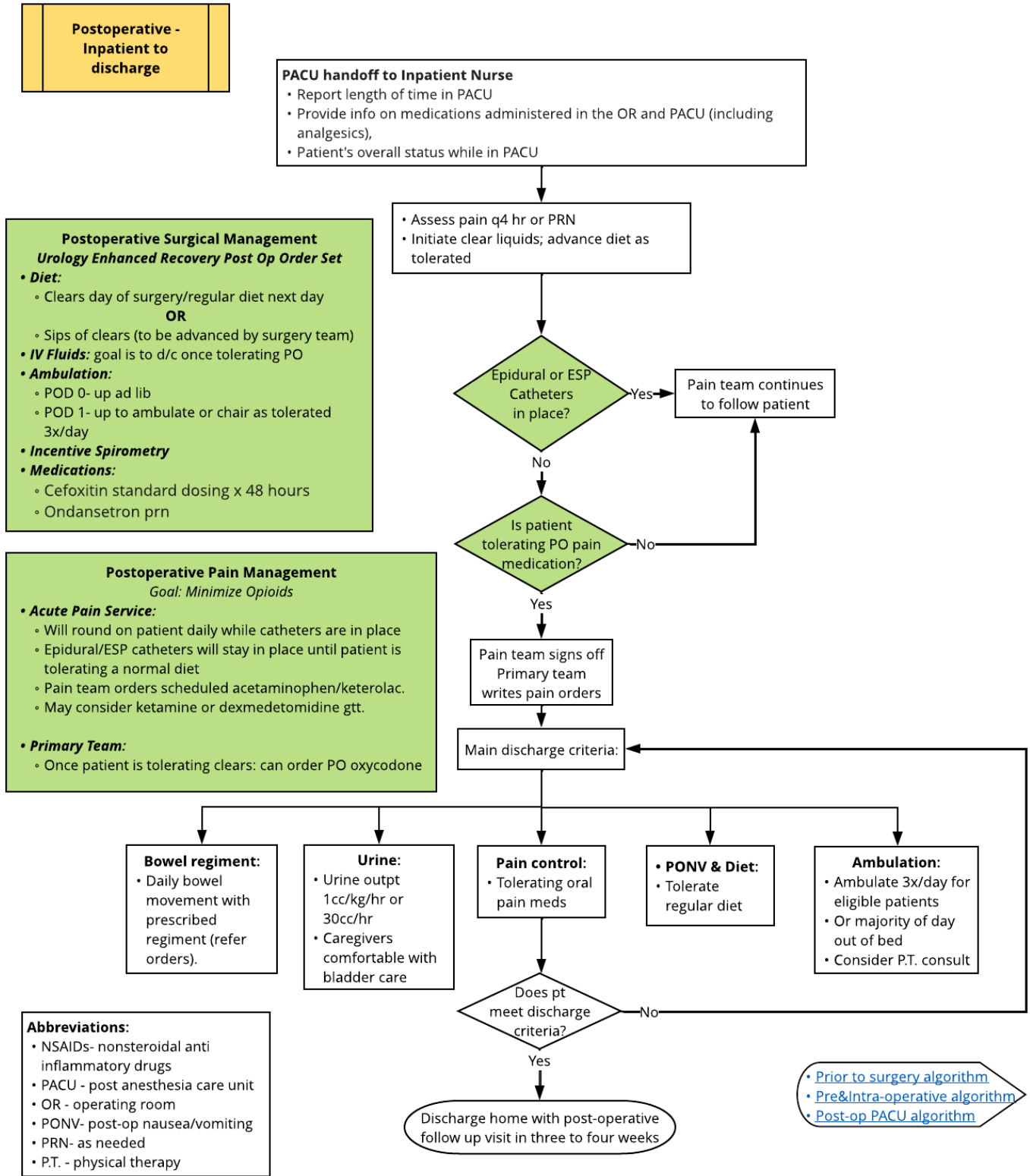
• [Pre&Intra-operative algorithm](#)

• [Post-op inpatient and discharge algorithm](#)

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Postoperative: Inpatient to Discharge algorithm



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Objective of ERAS Model

The objectives for the Bladder Reconstruction ERAS pathway are to minimize the variation of care for the patient undergoing bladder reconstruction or mitrofanoffs 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/Epidemiology

Reconstructive surgery for patients with neurogenic bowel and bladder has been an important part of improving the health and quality of life for these patients for decades. Recovery after these reconstructive surgeries can be long and at times difficult. Historically some patients would routinely spend a week in the hospital while dealing with poor pain control as regional anesthesia was not routinely used and slow advancement of diet. In the last several decades the application of Enhanced Recovery After Surgery (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). Recent studies of these protocols in pediatric reconstructive procedures have also been promising, although numbers remain small (Rove 2018). Key elements to ERAS include:

- Preoperative education of patients and family with an introduction to ERAS
- Oral carbohydrate load 2-3 hours before surgery
- Avoidance of prolonged fasting
- No additional bowel preparation
- Standardized anesthesia protocol including regional or neuraxial anesthesia when possible
- Goal-directed strict intraoperative intravenous fluid therapy guidelines to avoid hypo- or hypervolemia
- Minimize opioid use
- Minimize use of drains and NG tubes when possible
- Initiate early feeding and ambulation

Specific application of these principles will have to be tailored to the patient (i.e., early ambulation/activity for patients with significant neurologic deficits) and implementation of some of the elements is counter to historical practices (i.e., early advancement of diet and avoiding aggressive bowel preps). However, ERAS has been shown to be safe and improve outcomes in a wide variety of patients and will be an important part of helping patients and families through recovery.

Target Users

Anesthesiologists, Urologists, Urology surgeons, nurse practitioners, PAT nurse practitioners

Target Population

ERAS Inclusion Criteria

- Patients undergoing bladder reconstruction and/or mitrofanoffs procedures

Core Principles of ERAS (Melnik 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 during the 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 some of the core concepts of ERAS, including the emphasis early post-op PO intake and a multimodal pain management approach. Expectation management is crucial in the preoperative phase. A [handout](#), approved by the Health Literacy, is 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 neuraxial or regional anesthesia:
 - Epidural if a candidate OR
 - Bilateral erector spinae plane (ESP) blocks with catheter OR
 - Bilateral transverse abdominal plane (TAP) blocks
- 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 euolemia with an emphasis on not administering excess IV fluids

Post-Operative Care

The principal goals during the postoperative care of these patients are:

- Utilizing the Urology Enhanced Recovery Post Op order set
- Prevent/treat post-operative nausea and vomiting; avoid nasogastric (NG) tube
- Acute Pain Service (APS) to follow patient and manage pain medications
- Keep indwelling pain catheters (epidural or ESP) in place
- Multimodal pain control with long-acting opioids as 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
- Clinic follow-up 3 weeks after discharge in Urology clinic

Additional Questions Posed by the ERAS Committee

No clinical questions were posed for this review

Key Metrics To Be Monitored:

Pre-Op	Intra-Op	Post-Op
Carb-rich drink	Dexamethasone/Ondansetron	PONV PACU Score
	Neuraxial/Regional Anesthesia	Opioids
	Euvolemia	Time to diet
	Antibiotics administered prior to incision	Length of Stay
	IV Acetaminophen/IV Ketorolac	
	Opioids	

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Value 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.

- Decreased risk of overtreatment (i.e., treatment for meningitis when treatment for urinary tract infection is more appropriate)
- Decreased inpatient length of stay
- Decreased unwarranted variation in care
- Improved communication between patients and care team throughout the perioperative period
- Improved post-operative pain control

Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers
- Challenges with follow-up faced by some families

Potential Facilitators

- Collaborative engagement across care continuum settings during ERAS development
- High rate of use of ERAS

ERAS Model Preparation

This ERAS was prepared by the Department of Evidence Based Practice (EBP) in collaboration with the Bladder Reconstruction ERAS committee composed of content experts at Children's Mercy Kansas City. Development of this ERAS pathway supports the Division of Quality Excellence and Safety's initiative to promote care standardization that is evidenced by measured outcomes. If a conflict of interest is identified the conflict will be disclosed next to the committee member's name.

(Name of ERAS) ERAS Committee Members and Representation

- Joel Koenig, MD | Department of Urology | Committee Chair
- Christian Taylor, MD | Department of Anesthesiology | Committee Member
- Azita Roberson, MSN, RN, CPN, APRN, FNP-C | Department of Anesthesiology | Committee Member
- Azadeh Wickham, FNP-BC | Department of Urology | Committee Member
- Erica Campos, RN | Department of Urology | Committee Member
- Michelle Beisly, MSN, RN, CPN | Education Coordinator II 4 West | Committee Member

EBP Committee Members

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Andrea Melanson, OTD, OTR/L | Evidence Based Practice

Additional Review & Feedback

- The ERAS pathway was presented to each division or department represented on the ERAS committee as well as other appropriate stakeholders. Feedback was incorporated into the final product.

ERAS Development Funding

The development of this ERAS pathway was underwritten by the Departments of Evidence Based Practice, Anesthesiology, and Urology.

Conflict of Interest

The contributors to the Endometriosis ERAS have no conflicts of interest to disclose related to the subject matter or materials discussed in this care process.

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Approval Process

- This product was reviewed and approved by the Urology ERAS Committee, Content Expert Departments/Divisions, and the EBP Department.
- ERAS pathways are reviewed and updated as necessary every year within the EBP Department at CMKC. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Approved
4 West Post-op Care Unit	January 2022
Anesthesiology Department	January 2022
Evidence Based Practice Department	January 2022
Urology Department	January 2022

Version History

Date	Comments
January 2022	First Version
May 2023	Minor revisions including medication updates

Date for Next Review:

- **May 2024**

Implementation & Follow-Up

- Once approved, this ERAS pathway was presented to appropriate care teams and implemented.
- Key metrics will be assessed and shared with the appropriate care teams to determine if changes need to occur.
- Education tools for patients and families were created for pre-surgery visits including a preparation checklist and an overview of the ERAS pathway. The tools were reviewed by health literacy.
- This ERAS pathway is scheduled to be revisited by all teams within 6 months of the release date.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the ERAS algorithm(s) and the power plans that accompany the guideline.

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References

- Fearon, K.C., Ljungqvist, O., Von Meyenfeldt, M., Revhaug, C.H., Dejong, K.Lassen, et al. (2005). Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. *Clin Nutr*, 24, 466–477. <https://doi.org/10.1016/j.clnu.2005.02>.
- Liu, V.X., Rosas, E., Hwang, J., Cain, E., Foss-Durant, A., Clopp, M., et al. (2017). Enhanced recovery after surgery program implementation in 2 surgical populations in an integrated health care delivery system. *JAMA Surg*, 152, e171032. <https://doi.org/10.1001/jamasurg.2017.1032>
- Melnyk, M., Casey, R. G., Black, P., & Koupparis, A. J. (2011). Enhanced recovery after surgery (ERAS) protocols: time to change practice? *Canadian Urological Association Journal = Journal de l'Association des urologues du Canada*, 5(5), 342–348. <https://doi.org/10.5489/cuaj.11002>
- Rove, K.O., Brockel, M.A., Saltzman, A.F., Donmez, M.I., Brodie, K.E., Chalmers, D.J., et al. (2018). Prospective study of enhanced recovery after surgery protocol in children undergoing reconstructive operations. *J Pediatr Urol*, 14(3), 252.e1-252.e9. <https://doi.org/10.1016/j.jpuro.2018.01.001>
- Thiele, R.H., Rea, K.M., Turrentine, F.E., Friel, C.M., Hassinger, T.E., McMurry, T.L. et al. (2015). Standardization of care: impact of an enhanced recovery protocol on length of stay, complications, and direct costs after colorectal surgery. *J Am Coll Surg*, 220, 430–443. <https://doi.org/10.1016/j.jamcollsurg.2014.12.042>

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Appendix
Supporting Tools

ERAS

Enhanced Recovery After Surgery

Patient Pre-Operative Checklist

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

 <p>SURGERY</p>	<p>My child's bladder surgery starts at _____ on _____.</p> <p>You will receive a call 2 business days before surgery with more instructions on fasting, when to arrive, and where to go.</p>	<input type="checkbox"/>
 <p>BOWEL ROUTINE</p>	<p>Do your child's normal bowel routine (MiraLAX, MACE flush, cone enema, etc.) the day before surgery.</p> <p>They should eat regular, healthy meals the day before surgery. They must stop eating at least 6 hours before surgery starts.</p>	<input type="checkbox"/>
 <p>CLEAR CARB</p>	<p>Choose a clear, carbohydrate-rich drink like Gatorade or Pedialyte for your child to drink 2-3 hours before surgery.</p> <p>Try to have them drink about 12 oz. before surgery. They must finish drinking it no later than 2 hours before the surgery time.</p>	<input type="checkbox"/>
 <p>MEDICINES</p>	<p>If your child takes the bladder relaxant <i>oxybutynin</i>, give it for the last time the night before surgery.</p> <p>Give other medications on surgery day as instructed in PAT.</p>	<input type="checkbox"/>
 <p>QUESTIONS</p>	<p>We are here to help with your questions before surgery.</p> <p>For surgery questions, call the Urology Clinic: (816) 234-3395 For anesthesia questions, call the PAT Clinic: (816) 802-1238</p>	<input type="checkbox"/>

Developed by Anesthesiology and Evidence Based Practice
2.02.22

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