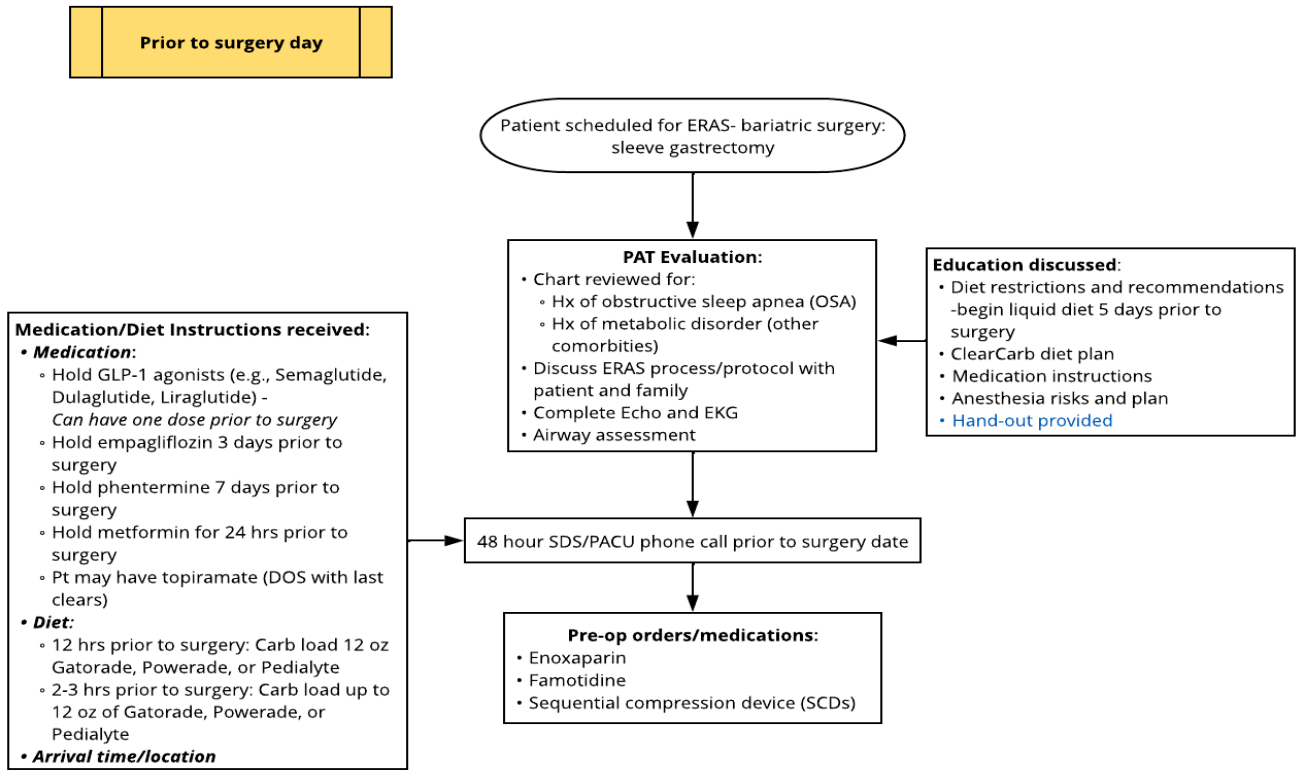
Gastric Sleeve
Enhanced Recovery After Surgery (ERAS) Pathway Synopsis

Prior to Surgery Day Algorithm

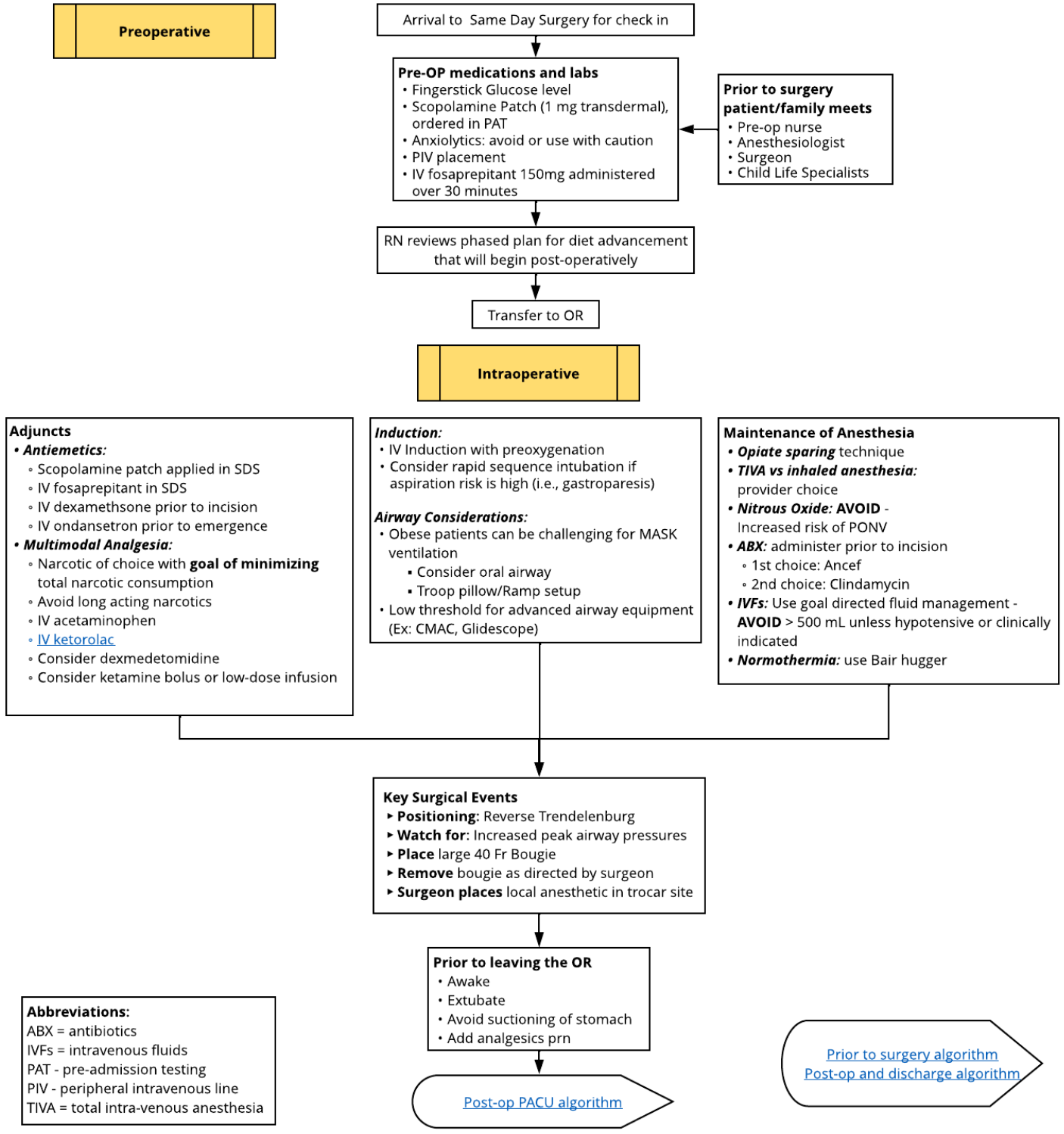


Abbreviations:
DOS-Day of Surgery
PAT- pre-admission testing
SDS - same day surgery

Pre- & Intra-operative algorithm
Post-op PACU algorithm
Post-op and discharge algorithm

**These pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare a pathway for each. Accordingly, these pathways should guide care with the understanding that departures from them may be required at times.*

Preoperative and Intraoperative Algorithm



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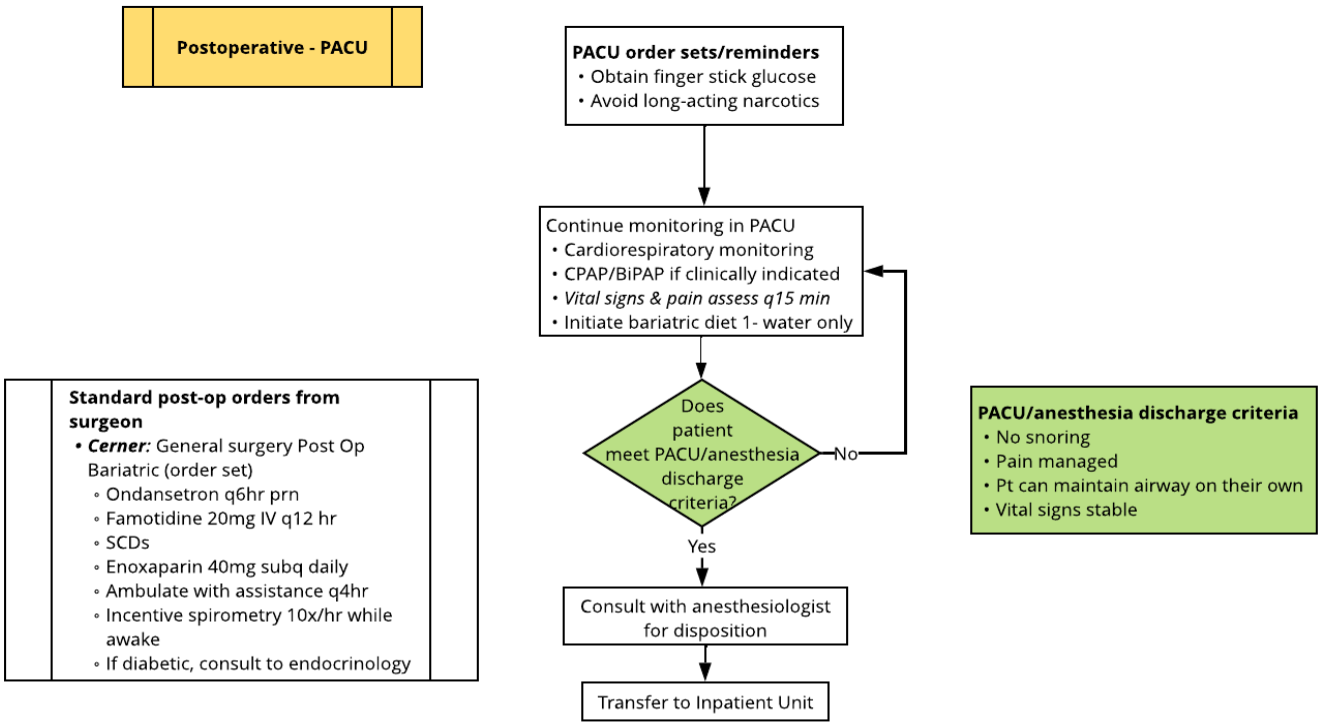
Postoperative – PACU Algorithm



Abbreviations:
PACU - post anesthesia care unit
CPAP - continuous positive airway pressure
BiPAP - bilevel positive airway pressure
SCDs - sequential compression device

Prior to surgery algorithm
Pre- & Intra-operative algorithm
Post-op and discharge algorithm

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Postoperative – Inpatient to discharge Algorithm

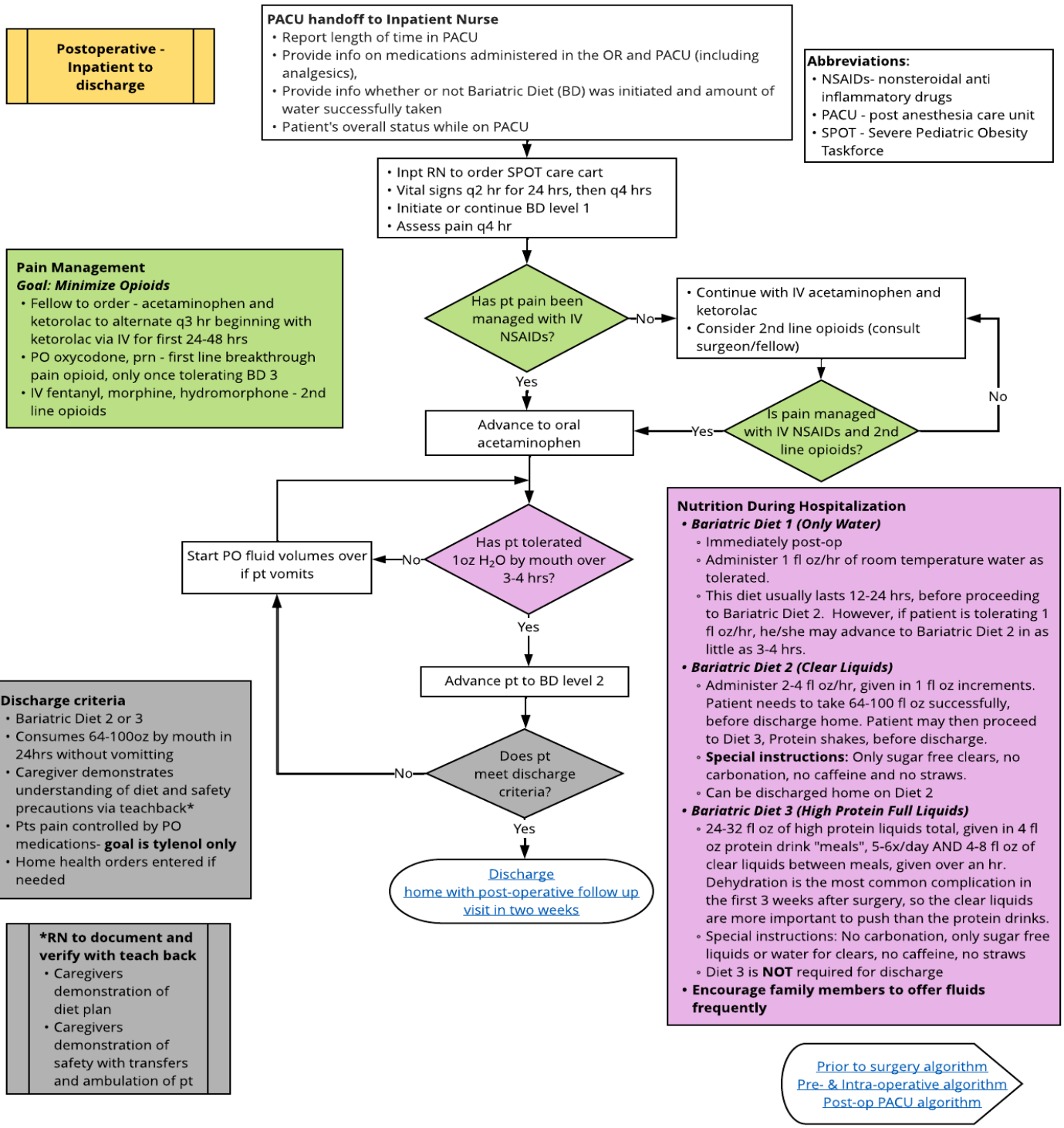

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Table of Contents

Objective of the ERAS Pathway:

Foster evidence-based collaboration with all perioperative team members with the goal of minimizing the variation of care and improving patient and family satisfaction

Background:

Weight loss surgery in the obese population has been commonplace for many years. Studies have shown a reversal or reduction in the severity of obesity-related medical outcomes. However, this is a relatively new concept in the pediatric population and a growing problem due to the earlier onset and increasing prevalence of pediatric obesity (Gurnani et al., 2015). Obesity is a systemic disease that challenges the anesthesiologist and surgeon (Brenn, 2005).

Frequent comorbidities include insulin resistance, hypertension, hyperlipidemia, GERD, as well as obstructive sleep apnea. Patients may be on weight loss medications that are of concern to the anesthesiologist, particularly sympathomimetic medications (phentermine) and antihypertensive medications (i.e., ACE inhibitors) (Stephens et al., 2005; Hollmann et al., 2018). Obesity also creates additional concern for position injuries, which are more common than patients with a normal BMI (Warner et al., 1994). The surgical exposure involves steep Reverse Trendelenburg and rotation. These patients must be secured to the table to avoid rare but serious injuries from falling or pressure point injuries. The airway is also an area of concern as these patients may be difficult to mask, ventilate or intubate. Patients may have sleep studies but frequently do not.

Generally, the surgical time for sleeve gastrectomy is 1.5-2.5 hours. Postoperatively, patients are typically admitted for a few days, and the main goal of this ERAS pathway is to decrease the total length of stay. Postoperative nausea and vomiting, pain control, and PO intake are some of the challenges during the inpatient portion of the hospital stay. The age range is usually 14-18 years but may be trending to include younger patients in the future as efficacy is demonstrated.

Target Users:

- Anesthesiologists
- Bariatric surgeons
- Pre-Anesthesia testing nurse
- Post Anesthesia Care Nurses
- Inpatient floor nurses

Target Population:

ERAS Inclusion Criteria

- Patients 14 – 18 years of age diagnosed as obese
- Patient having one or more of the following comorbidities:
    - Insulin resistance
    - Hypertension
    - Hyperlipidemia
    - GERD
    - Obstructive sleep apnea

Eras Exclusion Criteria

- Patients who have not complied with medications and counseling

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

- Preoperative education of patients and families 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 postoperative enteral feeding

ERAS Management Recommendations:

Preoperative Care

- The concept of ERAS is presented to the patient/family at the initial surgical appointment 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 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.
- A handout, reviewed by the Health Literacy Committee, is given to the family prior to departing PAT (See Appendix A).
- These patients begin a liquid diet five days prior to the scheduled procedure and 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 and is administered a scopolamine patch and enoxaparin in pre-op holding.
- IV fosaprepitant for postoperative nausea and vomiting prophylaxis

Intraoperative Care

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

- Safely secure the airway after an IV induction, as these patients may be difficult to bag-mask ventilate or have a difficult airway
- Maintain normothermia during the entire procedure
- Ensure that antibiotics are administered prior to surgical incision
- Minimize the use of long-acting narcotics
- Multimodal pain management, including IV acetaminophen and ketorolac
- Post-operative nausea and vomiting prophylaxis with dexamethasone and ondansetron
- Maintain euvolemia with an emphasis on not administering excess IV fluids
- Awake extubation while avoiding suctioning of stomach
- A conditional recommendation is made for the use of TAP blocks in laparoscopic gastric bypass surgeries, based on the GRADE Evidence to Decision instrument and the Summary of Findings Table. The overall certainty in the evidence is moderate for using TAP blocks to reduce postoperative opioid need and consumption. However, subjective data collected on patients' pain levels using a visual analog scale (VAS) showed the evidence is of moderate to very low evidence for pain level reduction at zero hours and 24 hours postoperative. The use of TAP blocks for gastric sleeve surgeries at Children's Mercy will be determined with additional data collected.

Postoperative Care

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

- Prevent/treat post-operative nausea and vomiting
- Multimodal pain control with long-acting opioids as the last option
- Move towards PO intake as early as possible
- Early mobilization
- Transition from clear to high-protein liquids
- Focus on early discharge from the hospital with home instructions (See Addendum B).
- Clinic follow-up two weeks after discharge
- See Gastric Sleeve ERAS power plan

Additional Questions Posed by the ERAS Committee

- Ketorolac in gastric bypass patients and risk of bleeding
- Use of Transverse Abdominal Plane (TAP) blocks and reduction of pain in lap gastric bypass patients

Key Metrics to Be Monitored

Pre-Op	Intra-Op	Post-Op
Scopolamine Patch	Dexamethasone/Ondansetron	Length of Stay
Enoxaparin	Euvolemia	Time to Ambulation
	Antibiotics administered prior to incision	Time to Bariatric 2 Diet
	IV Acetaminophen/IV Ketorolac	Long-Acting Opioids
	Long-Acting Opioids	
	Normothermia	

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., providing opioids when pain can be controlled with multimodal pain management)
- Decreased inpatient length of stay
- Decreased unwarranted variation in care
- Improved communication between patients and the care team throughout the perioperative period
- Improved post-operative pain control

Potential Organizational Barriers and Facilitators

Potential Barriers

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

Potential Facilitators

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

ERAS Pathway Preparation

This ERAS pathway was prepared by the Department of Evidence Based Practice (EBP) in collaboration with the Gastric Sleeve ERAS committee composed of content experts at Children's Mercy Kansas City. Literature analysis for additional questions posed by the Gastric Sleeve ERAS Committee was performed by EBP Scholars and the EBP team. The 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.

Gastric Sleeve ERAS Pathway Committee Members and Representation

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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 Pediatric Surgery.

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.

Approval Process

- This product was reviewed and approved by the Gastric Sleeve 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-Operation Unit	October 2021
Anesthesiology	October 2021
Evidence Based Practice	October 2021
Bariatric Surgery	October 2021
Same Day Surgery/Post-Anesthesia Care Unit	October 2021

Version History

Date	Comments
October 2021	First version- created algorithm and synopsis to guide surgical care
January 2023	Version II – completed and included update to medications
July 2023	Version III – completed and updated medications, broken links, format

Date for Next Review

- July 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 yearly.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) that accompany the ERAS pathway.

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References

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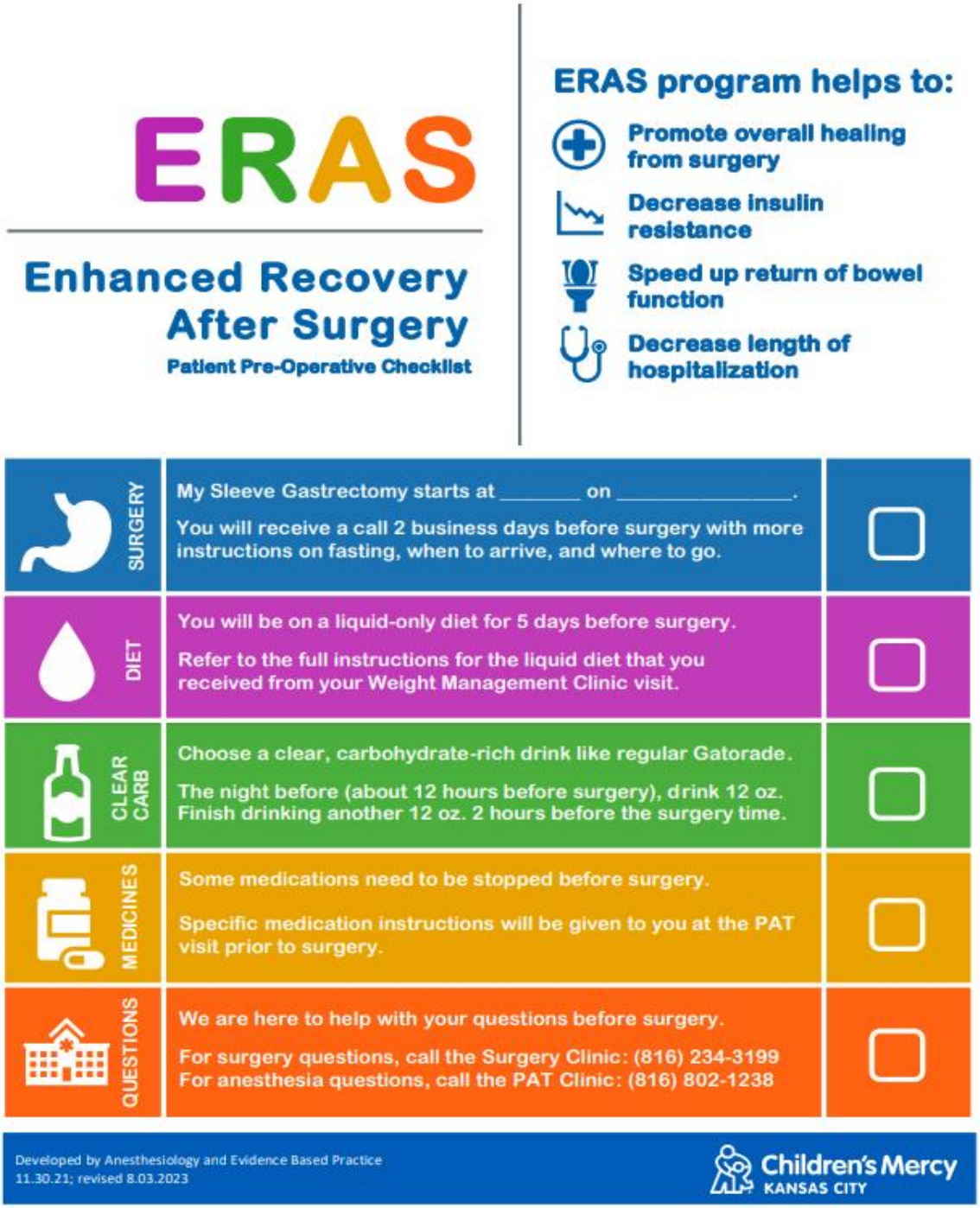
Appendix A: Gastric Sleeve ERAS Pre-op Handout



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Appendix B: Gastric Sleeve Discharge Instructions
Bariatric Surgery Discharge Instructions

You had an operation called "**gastric sleeve bariatric surgery**." This changed your stomach so it can only hold a small amount of food and liquids.

- This should help you lose weight. It will also decrease your risks for diseases linked with obesity, like diabetes or heart disease.
- After this surgery you need to stay on a special diet. (We already discussed the diet during your visits in the weight loss clinic. It is outlined in the Bariatric Nutrition Guide.)

Diet After Bariatric Surgery
During the first few months after your surgery, you will go through 4 diet stages. These stages let your stomach to heal without problems such as throwing up or getting food stuck. After surgery, you may feel a sticking feeling when you drink or eat. This usually goes away over time.

No matter what stage of the diet you are in, **remember:**

- **Drink at least 64 ounces of water** or other healthy drink option each day. Dehydration is one of the most common complications of patients after surgery.
- Do not drink through a straw. (Drinking should be slow: drinking from a straw encourages faster drinking and take in more air which can cause abdominal discomfort).
- Do not drink carbonated drinks such as pop or sparkling water. This can cause you stomach pains.
- Take your multi-vitamin daily.
- In Stage 3 - You start your soft protein meals. Be sure to take small bites and eat slowly.
- Stop eating when you are full when eating solid foods.

Stay well hydrated!

- Carry a large water bottle with you wherever you go.
- Do not drink caffeine (coffee and many kinds of pop). Caffeine drinks can put you at risk for dehydration.
- Drink the liquids on the clear liquid list (below) that you like.

Clear liquid list (Remember: no bubbles!)

- Water
- Powerade Zero®
- Crystal Light®
- Sugar-free Kool Aid®
- Propel®
- Diet V8 Splash®
- Gatorade Zero®
- Diet lemonade
- Decaffeinated coffee or tea
- Clear broth
- Sugar free popsicles
- Sugar free Jello®
- Vitamin Water Zero®

Stages of the diet after surgery (These are outlined in your Bariatric Nutrition Guide)

Stage 1: Water and sugar free clear liquid

- This stage starts in the hospital and begins with water. Then you will progress to clear liquids.
- When you go home, you should be drinking **at least 64-100 ounces of clear fluid** each day.

Stage 2: High protein liquids

- This stage may start at discharge or a few days after discharge. It depends on how you feel.
- You should still be drinking **at least 64-100 ounces of clear fluid** each day.
- This stage includes **24-32 ounces of high protein liquids**. This may be given in 4 ounce "meals" (protein drinks), 6-8 times each day.

Stage 3: Soft protein foods

- This stage will start after your 2 week follow up visit. You surgeon and bariatric weight management team will make sure you are ready.
- You should still be drinking **at least 64-100 ounces of clear fluid** each day.

Stage 4: Your eating plan for life!
The weight management team will talk with you about this stage after the first 3 stages are completed.

Activity after surgery
- You may increase your activity slowly.
- Walk as often as you feel able.
- You do not have limits on what you can lift but listen to your body. If it hurts, don't lift it.

School
You may return to school before your follow up visit if your pain is controlled. Make sure you are feeling good on your diet. **Be sure to drink at least 64 ounces each day, even when you return to school.**

Sleep apnea care
If you use CPAP or BiPAP for sleep apnea, continue to do so until your doctor advises you to stop.

Care for you incision after surgery
- Keep your incision dry except when cleaning.
- No baths, swimming pools, or hot tubs until you follow up with your surgeon
- You may start to shower on the first day after your surgery and then as needed.
- Wash the incision gently with warm soapy water. Pat dry with a towel.
- Surgical glue or steri strips (small pieces of white tape) will fall off on their own in 10-14 days.

Call your surgeon at _____ if you have any of these:
- Cloudy or foul-smelling fluid coming from the incision.
- Redness, pain or increase swelling at the incision sites.
- Fever of 100.4°F or higher.
- Decreased urine or dark urine.
- Sudden difficulty breathing or chest pains.
- Persistent pain, nausea, or vomiting after drinking or eating.

Follow up visit after surgery
- You will have a follow up visit at the Surgery Clinic 2 weeks after your surgery. Then you will have visits at 1, 3, 6, 12 and 24 months after surgery.
- You will also continue to follow up with our weight management team after surgery.
- Please go to all your appointments. Call as soon as possible if you need to reschedule.

If you have questions:
- Our nurse takes calls Monday through Friday from 8:00 a.m. to 4:30 p.m.
- Calls after 4:30 p.m. will go to our answering service. The doctor will be paged as needed.

Please use your **patient portal** to send your questions or concerns to your providers. Please sign up for the patient portal if you have not done so already!
- Please use your patient portal to send your questions or concerns to your providers. Please sign up for the patient portal if you have not done so already! The patient portal allows you to:
    - review education given by your providers
    - see your test results
    - upload patient pictures to show your concerns to your providers.

Surgery Clinic Contact Information

Main Clinic phone number: (816) 234-3097
Main Clinic fax number: (816) 302-9634

Kansas Clinic phone numbers: (913) 696-8750 or (913) 696-8699