Bariatric Surgery Anesthesia Management Guideline

Purpose:
- To create a Bariatric Enhanced Recovery After Surgery (ERAS) Program that provides standardization and, where possible, evidence-based guidelines for anesthetic care of patients undergoing bariatric surgery at Augusta University Health System.

Target Patients: Bariatric surgical patients
- Inclusion criteria: all emergent, urgent, and elective bariatric surgical patients except as noted below:
- Exclusion criteria/Contraindications:
  - Allergies or adverse reactions to any medications listed;
  - Neuraxial contraindication due to anticoagulation, prior to surgery, patient refusal, or anatomy.
  - Unique disease or patient condition that may cause specific therapies listed to be contraindicated.

Preoperative Interventions

Perioperative Risk Stratification to be completed by admitting team using 2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery.

Preoperative medical assessment to include screening for malnutrition, anemia, diabetes mellitus, obesity, immune modulating therapy, chronic opioid use and tobacco use. Additionally, appropriate screening for advanced directives. Initiate appropriate interventions based on screening.

Orders to be written by Surgical Team

Pre-operative Optimal Fluid Management
- Encourage clear liquid PO intake until 2 hours prior to OR time
- Carbohydrate drink ~3 hours prior to scheduled start of surgery (when known, otherwise at 5AM).
- Extend intake to 4 hours prior to OR if history of advanced diabetes/gastroparesis (consult anesthesiologist for questions)

Gabapentin: 300mg po 1 hour before OR time
- Reduce to 100mg po if:
  - Age > 65 years
  - Weight < 70 kg
  - Creatine > 1.5 or Creatine clearance < 60 ml/min
• History of prolonged operative sedation
  o Consider dose reduction in patients with OSA
  o If patient takes gabapentin at home, dose may be equivalent to home dosage
• **Acetaminophen:** 975mg po 1 hour before OR time
  o Reduce to 650 mg if < 70 kg
  o Do not use if history of liver disease
  o Maximum 24-hour dose is 3 grams.
• VTE chemoprophylaxis and/or mechanical prophylaxis
• Preoperative Prophylactic Antibiotic per AUHS Standard

**Regional Anesthesia (determined by case type)**

• **Full Laparotomy**
  o Bilateral Transverse Abdominis Plane (TAP) Blocks/ Bilateral Rectus Sheath Blocks
  o Thoracic epidural (discuss with surgeon)
• **Gastric Sleeve/Gastric Bypass**
  o Bilateral Transverse Abdominis Plane (TAP) Blocks/ Bilateral Rectus Sheath Blocks
  o No Dexamethasone in Blocks
• **Gastric Band Remove- patients will be discharged home after surgery**
  o Bilateral Transverse Abdominis Plane (TAP) Blocks/ Bilateral Rectus Sheath Blocks
  o No Dexamethasone in Blocks

**Intraoperative Interventions**

• Arterial lines should not be utilized unless clinically indicated for intraoperative cardiovascular monitoring.
• Place 2 large bore peripheral IVs or other suitable access in case of bleeding per anesthesia team.
• **No induction opioids; avoid opioid use during anesthetic:**
  o TIVA with propofol and ketamine is recommended, consider sevoflurane may be used for supplemental or primary anesthetic maintenance.
  ▪ If TIVA is used BIS monitoring is required.
  o Esmolol for heart rate control
  o Provide neuromuscular blockade for procedure
  o Provide full reversal of neuromuscular blockade
• **Ketamine**
  o 0.5 mg/kg bolus with induction plus 2-3 mcg/kg/min infusion after induction until fascia closure
  o Consider reducing (0.25 mg/kg) or eliminating bolus in patients > 65 years old
  o Consider the use of midazolam if concern exists for ketamine-associated dissociative effects (not required if no bolus is administered).
• **Lidocaine**
  o 1 mg/kg bolus with induction; 1 mg/min infusion from induction to end of case.
  o **No post-operative low-dose lidocaine infusion.**
  o Contraindications: Unstable heart disease, recent MI, heart block, heart failure, electrolyte disturbances, liver disease, seizure disorder, current anti-arrhythmic therapy, GFR < 30

• **Post-operative nausea and vomiting (PONV) prophylaxis**
  o Prophylactically use at least two agents from different classes to reduce PONV and consider additional if risk factors > 2
  o Consider TIVA or background propofol infusion for PONV prophylaxis
  o **Dexamethasone** 8 mg IV unless given during regional block
    ▪ Avoid in patients with uncontrolled diabetes
  o **Ondansetron** 4 mg IV given 30 minutes prior to emergence

**Intraoperative Cardiovascular, Fluid, and Metabolic Management**

• **Intraoperative Fluid Strategy**
  o Use lactated ringers unless contraindicated
  o Euvolemia to be achieved by administering approximately 1.5-2 liters during the course of the surgical case.
    ▪ Avoid aggressive fluid resuscitation
    ▪ No empirical deficit replacement
    ▪ If unable to improve MAPs with fluid resuscitation, have low threshold for phenylephrine or norepinephrine infusion.

• **Surgical Site Infection Reduction**
  o **Normothermia**
    ▪ Goal temperature is >36 C throughout the surgical case and upon arrival to PACU
    ▪ Achieved by prewarming the OR, keeping the patient covered, utilizing a forced air warmer or warming all IV fluids
  o **Oxygenation**
    ▪ Goal fraction if inspired oxygen (Fi) of 0.5-0.8 with positive end-expiratory pressure (PEEP) between 5-7 cm H2O during the case
      ▪ Avoid using 100% oxygen throughout case to prevent hyperoxia
    ▪ Supplemental O2 continued after the surgical case (i.e., titrate to 2 L/min NC in PACU, consider continuing 2L/min via NC x 24 hours post op)
  o **Antibiotics**
    ▪ Appropriate prophylactic antibiotic to be administered within 60 minutes of incision and re-dosed as appropriate
  o **Ventilation**
    ▪ Goal end title CO2 > 38 mmHg except in patients with contraindications (e.g., pulmonary hypertension, ICP, etc.)
    ▪ Use tidal volumes of 6-8mL/kg
  o **Glucose**
Goal blood glucose 140-180 mg/dL (NOTE: DO NOT give dextrose to raise blood glucose unless it is <60 mg/dL; no action needed if glucose is 60-140 mg/dL; monitor as below.

Intra op glucose > 140 mg/dL: use calculator to determine insulin infusion rate. If insulin infusion present at end of case:

- Contact PACU resident and inform of presence of insulin infusion
- Goal is to transition to all patients to sliding scale prior to PACU d/c if possible with goal of <180 mg/dL
- All non-diabetic patients leaving PACU on insulin sliding scale or infusion will have surgical team notified.

Site Prep

- Chlorhexidine surgical skin preparation
- No shaving; careful use of clippers and CHG bath prior to OR
- Scrub the hub for accessing all vascular access devices (CVLs, PIVs).

Immediate Postoperative Interventions

The administration of narcotic pain medication should be avoided in opioid-naïve patients reporting pain. Ensure that pain is appropriately assessed and utilize multimodal medications when feasible. PO medications ordered on the floor may be administered in PACU when appropriate. Rescue medications such as ketamine or methadone may be administer by anesthesiology residents or faculty when appropriate.

Orders to be written by anesthesia provider

- **Midazolam**
  - 1 mg IV ONCE, PRN Anxiety

- **Esmolol**
  - 10 mg IV, Q5 min, PRN Tachycardia
  - Administer in 10mg doses Q5 min for HR >100bpm

- **Ketorolac**
  - If not given intra-operatively
  - 15mg or 30 mg IV, ONCE Q6 hrs
  - Pain >4

- **Ondansetron – FIRST LINE AGENT**
  - 4mg IV ONCE, PRN Nausea/Vomiting

- **Haloperidol – SECOND LINE AGENT**
  - 0.5mg IV Q15 min, PRN Nausea/Vomiting
  - May repeat x1 dose

- **Promethazine – THIRD LINE AGENT**
  - 6.25 mg IV Q39 min, PRN Nausea/Vomiting
  - May repeat x1 dose

- **Diphenhydramine**
• 12.5 mg IV, Q3 hr, PRN itching

**Meperidine**
- 25 mg IV ONCE, PRN shivering

**Pain Score > 4 (Sharp or Searing Pain):** multiple pain medications may be used

- **Oxycodone immediate release** - Anesthesia to place order with appropriate weight-based order sentence for use in PACU.
  - 2.5mg or 5mg po q 4hr prn moderate pain score (score 4-6)
  - 5mg or 10mg po q 4hr prn severe pain (score 7-10).

**Call PACU resident or APS service** for pain issues not resolved by standard measures

**Maintain supplemental Oxygen** via FM/NC for duration of recovery period

**Used forced air warming blanked or gown** at 40 degrees C until temperature >36.0 orally

**Postoperative Floor Interventions**

**Orders to be written by Surgical Team**

**Chronic Pain Patients** start home medication regimen as soon as PO intake is tolerated

- **Gabapentin**: 300mg po TID
  - Reduce to 100mg po if:
    - Age > 65 years
    - Weight < 70 kg
    - Creatine > 1.5 or Creatine clearance < 60ml/min
    - History of prolonged operative sedation
  - Consider dose reduction in patients with OSA
  - If patient takes gabapentin at home, dose may be equivalent to home dosage

- **Acetaminophen**: 975mg po Q8 hours x 3 days then prn
  - Reduce to 650 mg if < 70 kg
  - Do not use if history of liver disease
  - Maximum 24-hour dose is 3 grams.

- **Ketorolac**
  - 30 mg IV Q6 hours x 3 days
  - Use 15 mg IV Q6 hours in patients > 65 years old, creatine clearance <30, or weight <50kg

- **Hydromorphone IV** 0.2mg IV Q2h prn breakthrough pain x 3 days (for pain not responsive to oral medications after 1 hour).

- **Oxycodone immediate release** – surgeon to place appropriate weight-based order sentence
  - 2.5mg or 5 mg po q 4 HR prn **moderate** pain (score 4-6) x 10 days
5mg or 10mg po q 4 HR prn severe pain (score 7-10) x 10 days

- **Ondansetron - First Line Agent**
  - 4mg IV Push Q8 HR prn nausea
  - If not responsive to IV medication notify provider

- **Haloperidol - Second Line Agent**
  - 0.5-1mg IV PRN Nausea/ Vomiting

- **Promethazine - Third Line Agent**
  - 6.25-12.5 mg IV/PO PRN Nausea Vomiting

- **VTE** chemoprophylaxis and mechanical prophylaxis (e.g., sequential compression device or foot pumps).

- **Prophylactic postoperative antibiotics**

- **No NG tube**

- **Clear liquids** to advance per bariatric protocol

- **D/C foley** by POD1.

- **Progressive Mobility**