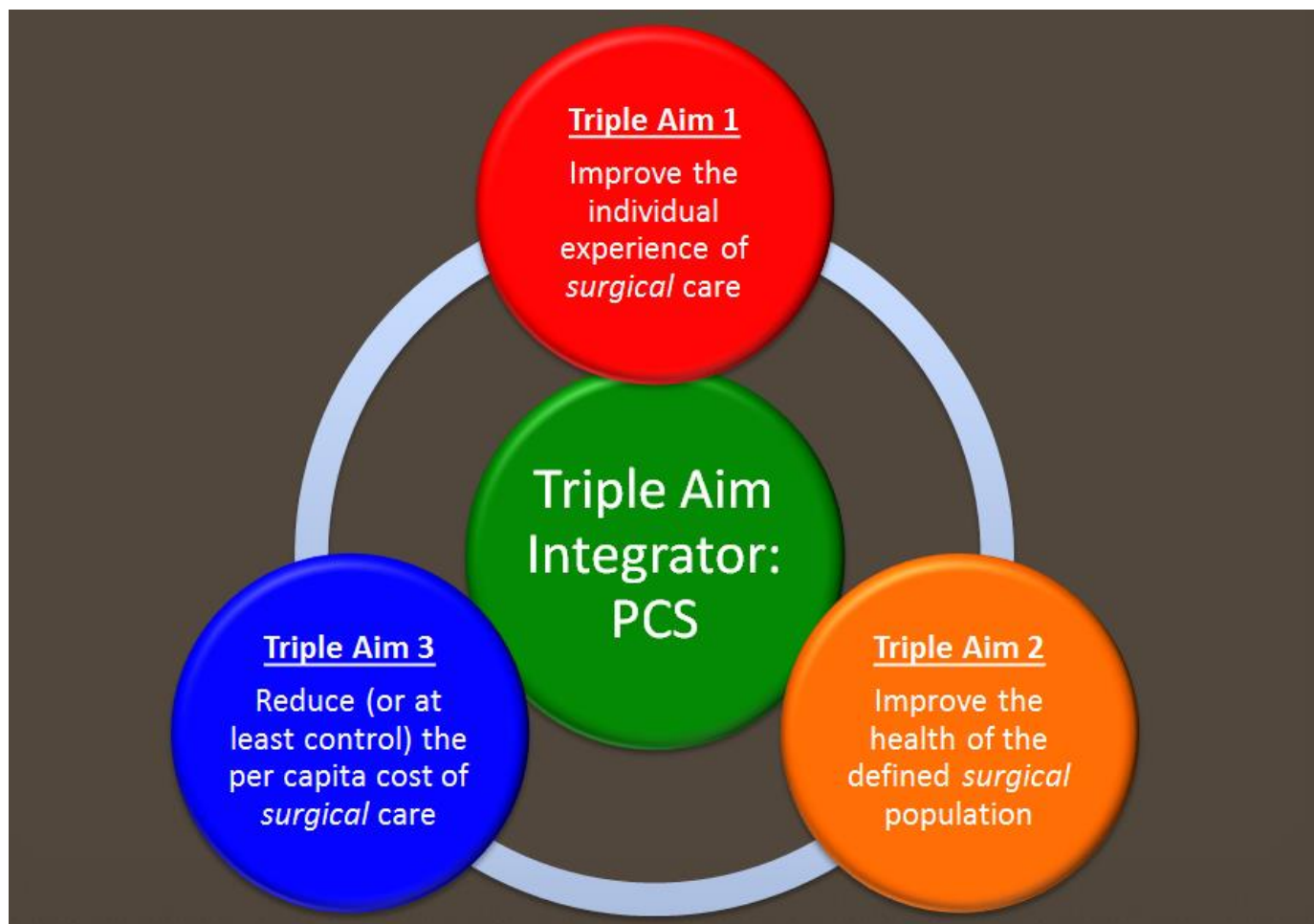


Lidocaine Infusion for Perioperative Pain Management

Marley Linder, PharmD

Matt McEvoy, MD

Perioperative Surgical Home: PCS



Shared Goals

- Improved Outcomes (pain, PONV, LOS, SSI)
- Improve Throughput (Clinic visits, reduced LOS/readmits)
- Improved Patient Experience

How could my patient look different than I have seen in the past?

- How could my patient look different than I have seen in the past?
 - Better pain control; no PONV
 - Little need for narcotics
 - Early return of bowel function; reduced LOS
 - Possible dizziness/sedation (gabapentin)
 - Possible effects of lidocaine infusion (discussed below)

Background

- **Why?**
 - Lidocaine is part of a multi-modal protocol designed to provide optimal perioperative care
- **Who?**
 - Patients undergoing general anesthesia for the laparoscopic or open colorectal surgery

Purpose

- To provide perioperative care that:
 - Maximizes perioperative pain control
 - Reduces opiate requirements and opiate adverse events

Can you give lidocaine on a general floor?

- Yes. Lidocaine infusion for perioperative pain management has been approved by the Vanderbilt Pharmacy and Therapeutics committee to be safe for use on the floor.

Contraindications

Lidocaine should not be ordered in patients with:

- Unstable coronary disease
- Recent MI
- Heart failure
- Heart block
- Electrolyte disturbances
- Liver disease
- Cardiac arrhythmia disorders
- Seizure disorders

Pre-op

- Gabapentin: 600mg po; 300 mg po if >65 yr. old; 100 mg po if >75 yr old
- Tylenol: 1000 mg po if >70 kg; 650 mg po if <70 kg; omit if history of liver disease
- Scopolamine patch: Use if >2 risk factors; avoid >65 yr. old or concern for over-sedation.

Intraoperative

(In addition to 'NO BUGS' Protocol)

- ***Laparoscopic/Hand Port Assisted*** Bilateral TAP block with 25cc 0.25% bupivacaine and 4mg dexamethasone per side

Laparotomy

Thor epip to be used during case with bupiv 0.1% with hydromorphone 10mcg/ml

Induction (preference for propofol as hypnotic)

Ketamine: 0.25-0.5mg/kg IV bolus if <65 yo; 0.25mg/kg IV bolus if >65 yo⁺

Lidocaine: 1.5 mg/kg IV bolus

Methadone: 10-20mg IV if chronic opioid user

No narcotics, use esmolol/metoprolol for HR/BP control

Maintenance (Volatile or Propofol TIVA)

Use of SV for GDFT protocol with FloTrac or NexFin

Ketamine: 5 mcg/kg/min infusion after induction until fascial closure

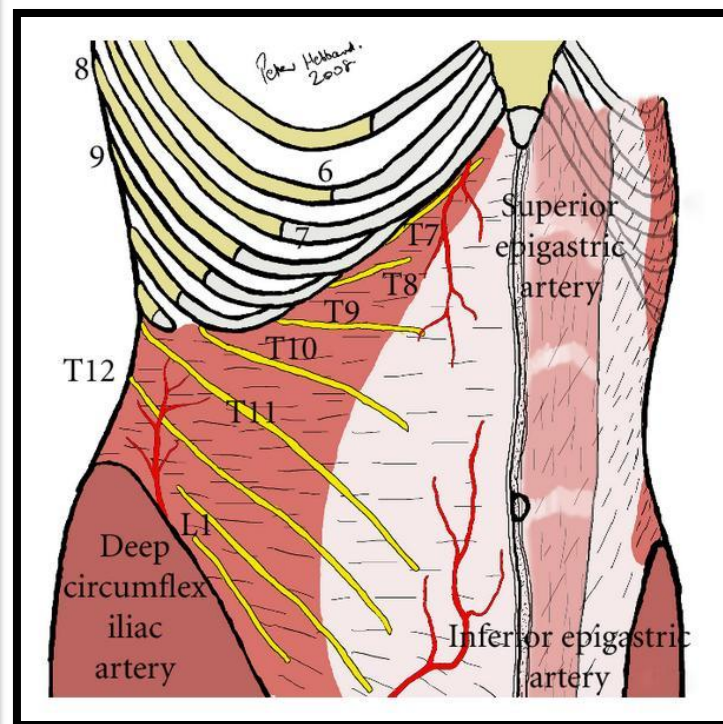
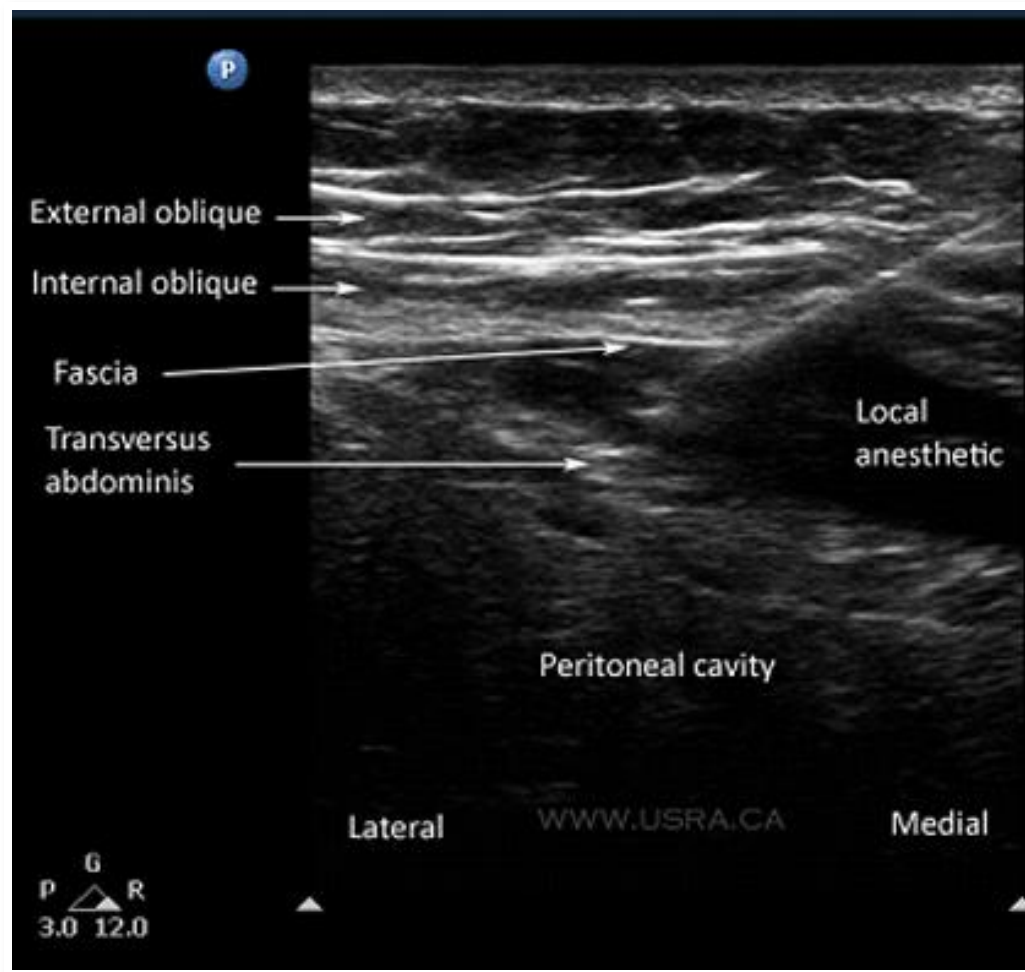
Lidocaine: 2 mg/kg/hr decreased to PACU dose by weight

Ketorolac: 30mg IV at fascial closure; omit if h/o renal dysfunction or GI bleed

PONV prophylaxis - ondansetron 4mg IV plus dexamethasone 8-10 mg (unless given in TAP blocks)

*Consider no bolus if concern for over-sedation in elderly.

TAP or 4 Quadrant Blocks



Post-Operative

- **All Cases**

- **Gabapentin:** 400mg-600mg PO tid until d/c,
 - then 300mg PO tid x7 days, then 100mg PO tid x 7 days; reduce if elderly/ sedated
- **Tylenol:** 1000mg PO q6h, then 500mg-1000mg PO q6h x 3 days,
 - then prn; decrease to 650mg per dose if < 70kg
- **Ketorolac:** 30mg IV q6h x 3 days; reduce to 15mg IV q6h >65 yo or Cr>1.5 or <50 kg
- **Opioids:** oxycodone 5mg PO PRN and then advance to others if needed.

Laparoscopic/Hand Port Assisted

Lidocaine: 1mg/min if < 70 kg,
1.5mg/min if 70-100 kg, 2 mg/min if >
100 kg for 24 hours postoperatively;
avoid if on other antiarrhythmic

Laparotomy

Thoracic epidural: bupivacaine 0.1% with
hydromorphone 10mcg/ml

After epidural d/c'd on POD 1-3,

Lidocaine: 1mg/min if < 70 kg, 1.5mg/min if 70-
100 kg, 2 mg/min if > 100 kg for 24 hours after
epidural discontinued; avoid if on other
antiarrhythmic

Compatibilities

- Lidocaine infusions are compatible with:
 - NS
 - D5W
 - LR
 - Individual components of Plasmalyte
 - Be sure to visually inspect Y site for precipitation

Dosing

- Actual Body Weight is required to order
- Dosing Algorithm:

Patient Weight	Lidocaine Dose
< 70 kg	1 mg/min
70 – 100 kg	1.5 mg/min
> 100 kg	2 mg/min

Alaris Pump

- **ALWAYS** use the Lidocaine guardrail
 - Choose one of the three dose options
 - 1 mg/min
 - 1.5 mg/min
 - 2 mg/min
- **Hard stop:** 2.1 mg/min
- **Do not program the pump without guardrails**
 - Programming errors associated with serious adverse drug events

Adverse Effects

- Nurse should monitor for these potential adverse effects q4h:

Level of Toxicity	Adverse Effects
Mild	• Numbness and tingling in fingers and toes • Numbness and unusual sensations around and inside the mouth • Lightheadedness, dizziness, visual disturbances, confusion • Metallic taste • Ringing in the ears
Moderate	• Nausea and vomiting • Severe dizziness • Decreased hearing • Tremors • Changes in blood pressure and pulse • Confusion
Severe	• Drowsiness, confusion, loss of consciousness • Muscle twitching • Convulsions • Cardiac arrhythmias, cardiac arrest

Lidocaine infusions: Toxicity

Level of Toxicity/Possible Adverse Effects

Mild – THINK PERIPHERAL

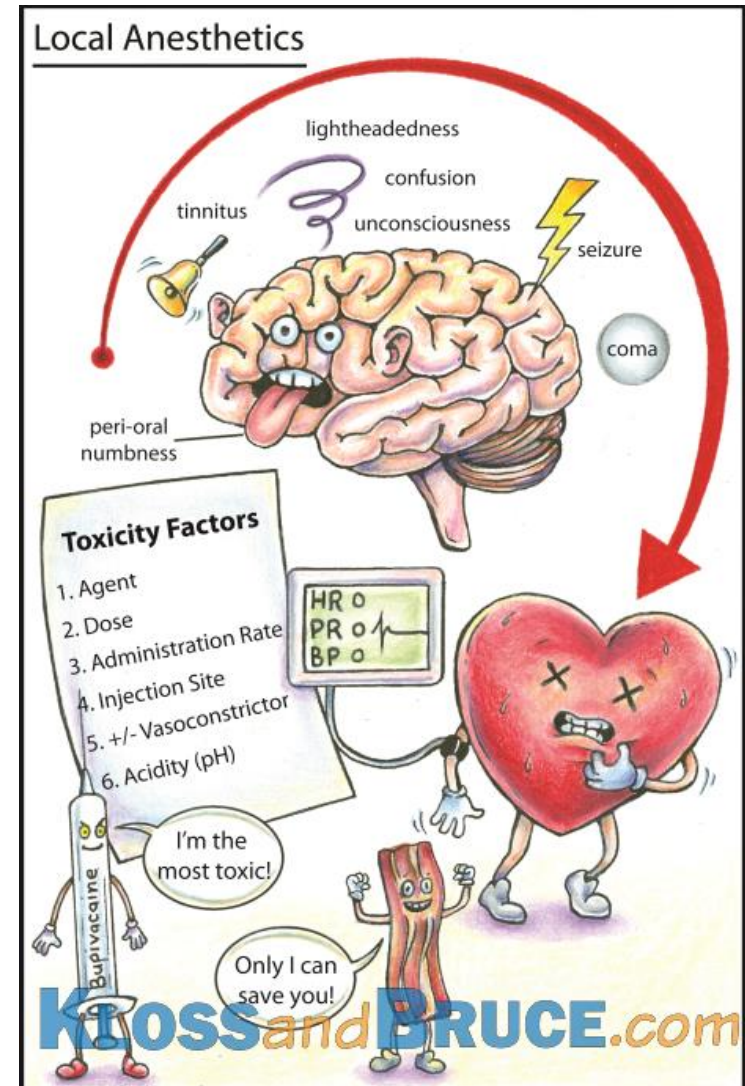
- Numbness and tingling in fingers and toes
- Numbness and unusual sensations around and inside the mouth
- Lightheadedness, dizziness, visual disturbances, confusion
- *Metallic taste*
- *Ring in the ears*

Moderate – THINK CENTRAL

- Nausea and vomiting
- Severe dizziness
- Decreased hearing
- Tremors
- Changes in blood pressure and pulse
- Confusion

Severe – THINK SYSTEMIC

- Drowsiness, confusion, loss of consciousness
- Muscle twitching
- Convulsions
- Cardiac arrhythmias, cardiac arrest



If adverse effects occur during infusion:

- **Stop** infusion immediately
- Page the lidocaine infusion beeper at 835-8990
- Inform anesthesia immediately

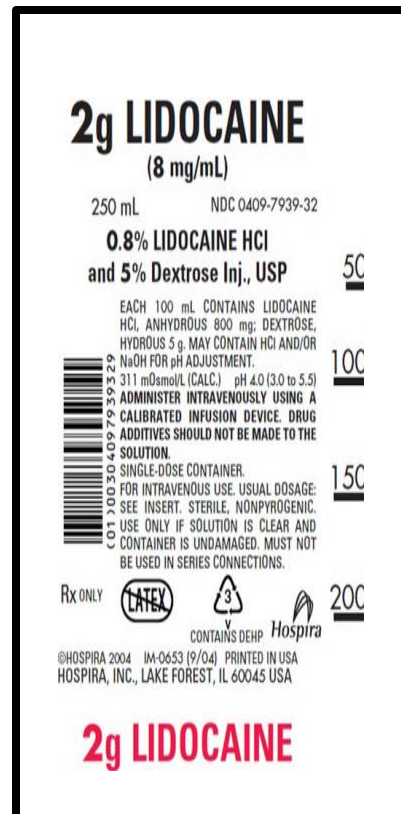
“GO-BAG” for life-threatening overdose

- IV lipid emulsion
 - Lorazepam
 - LAST management checklist
- 

The Pharmacologic Treatment of Local Anesthetic Systemic Toxicity (LAST) is Different from Other Cardiac Arrest Scenarios

- ☐ **Get Help**
- ☐ **Initial Focus**
 - ☐ **Airway management:** ventilate with 100% oxygen
 - ☐ **Seizure suppression:** benzodiazepines are preferred; **AVOID propofol** in patients having signs of cardiovascular instability
 - ☐ **Alert** the nearest facility having **cardiopulmonary bypass** capability
- ☐ **Management of Cardiac Arrhythmias**
 - ☐ **Basic and Advanced Cardiac Life Support (ACLS)** will require adjustment of medications and perhaps prolonged effort
 - ☐ **AVOID vasopressin, calcium channel blockers, beta blockers, or local anesthetic**
 - ☐ **REDUCE individual epinephrine doses to <1 mcg/kg**
- ☐ **Lipid Emulsion (20%) Therapy** (values in parenthesis are for 70kg patient)
 - ☐ **Bolus 1.5 mL/kg** (lean body mass) intravenously over 1 minute (~100mL)
 - ☐ **Continuous infusion 0.25 mL/kg/min** (~18 mL/min; adjust by roller clamp)
 - ☐ Repeat bolus once or twice for persistent cardiovascular collapse
 - ☐ Double the infusion rate to 0.5 mL/kg/min if blood pressure remains low
 - ☐ **Continue infusion** for at least 10 minutes after attaining circulatory stability
 - ☐ Recommended upper limit: Approximately 10 mL/kg lipid emulsion over the first 30 minutes
- ☐ **Post LAST events at** www.lipidrescue.org and report use of lipid to www.lipidregistry.org

Lidocaine Infusions



Why? Maximize perioperative pain management

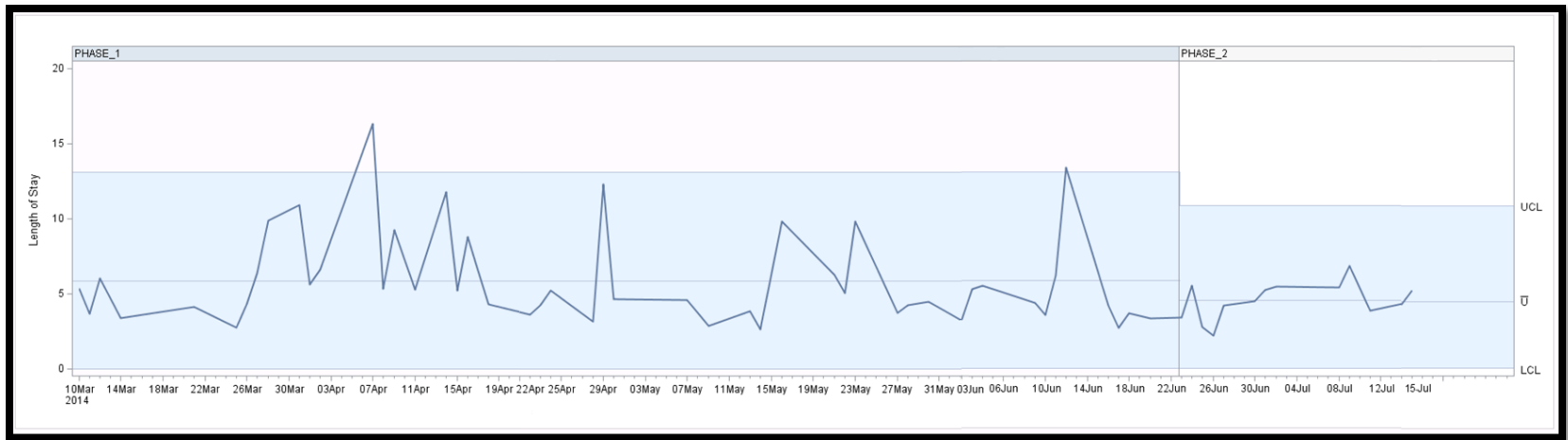
Who? All patients undergoing general anesthesia for the laproscopic or open surgical treatment of colorectal or inflammatory bowel disease (CRS and HIPEC patients).

Goal - Improve perioperative pain control & reduce need for opioids

Can you give lidocaine on a general care floor?

Yes, Lidocaine infusion for perioperative pain management has been approved by the Vanderbilt Pharmacy and Therapeutics committee to be safe for use on the floor.

Our Current Data: PCS and CRS



Based on latest data, if we could improve quality in this way – better pain control, PONV prevention, AND reduced LOS, it would translate to ~\$1.5M cost savings/year