2019-2020 Resident QI Project – Increasing Rates of Multi-Modal Analgesia

Inclusion Criteria

OR cases by any provider (attending, CRNA, resident, or fellow) that meet the following inclusion criteria:

- Case duration > 3 hours
- General Anesthesia
- Non-transplant or cardiac surgery
- Non ICU pts going to OR
- Pt age >18 and <70 yo

In our project, a multi-modal approach is defined as:

- Administering two intra-operative medications or anesthetic techniques from the lists below; or
- Administering one pre-operative medication and one intra-operative medication or anesthetic technique from the lists below.

Inpatient medications taken within 6 hours of case start will be counted.

Our goal is to increase multi-modal agent use by 10% cumulatively in July 2019-2020

(i.e., 66% cumulative total for the year!)

Pre-operative Medications

- Acetaminophen (PO)
- Celecoxib
- Diclofenac
- Gabapentin

Anesthetic Techniques

- Peripheral nerve block or catheter
- Epidural catheter
- Spinal

Intra-operative Medications

- Acetaminophen (IV)
- Dexamethasone 8mg or greater
- Dexmedetomidine infusion or bolus
- Ketamine infusion or bolus
- Ketorolac
- Lidocaine Infusion
- Magnesium Infusion or bolus

Medication	Dosing	Considerations
Acetaminophen (Pharmacy)	1000mg q6hr, max 4gm/day	• Adjustment for hepatic disease/cirrhosis: max <2gm/day • Weight-based dosing for pediatric patients/adults <50kg: 10-15mg/kg
Dexamethasone (Anesthesia cart)	Single dose: 0.1-0.2mg/kg (at least 8mg) Dilute in 50mL NS and give over 10 minutes if patient is awake	• Potential for impaired wound healing and immunosuppression, however no increased risk of post-surgical systemic or wound infection and no delayed wound healing in 2018 Cochrane review • Hyperglycemia • Severe perineal pain in awake patients (can avoid by diluting & giving slowly)
Dexmedetomidine (Pharmacy, anesthesia cart)	Infusion: 0.2-1.5mcg/kg/hr with 0.5-1mcg/kg loading dose over 10-20min Can carefully bolus per provider preference	• Commonly causes hypotension, bradycardia, transient hypertension (when given as bolus)
Ketamine (Drug box)	Infusion: 2-5mcg/kg/min Bolus: 0.5mg/kg	• Side effects include increase in blood pressure, cardiac output, and myocardial oxygen consumption, bronchodilation, salivation, lacrimation, nausea/vomiting • Patient tolerance most commonly limited by emergence delirium, visual hallucinations, dysthymia, anxiety, other unwanted emotional/psychiatric effects • Infusions can be continued post-operatively (in PACU, ICU, wards)
Ketorolac (Anesthesia cart)	Single dose 15-30mg or 15-30mg q6hr, max 120mg/day (for 5 days)	• Increased risk GI side effects (dyspepsia, nausea, ulcers) if >60, higher dose, concurrent use of glucocorticoids or antiplatelet agents • Increased risk of renal dysfunction in patients with HTN, DM, HF, or concurrent use of diuretics, ACE inhibitor, aminoglycoside • Increased risk of immunosuppression
Lidocaine (Anesthesia cart, ERAS/Spine packs)	Infusion: 2mg/kg/hr, consider loading dose of 1.5mg/kg over several minutes	• Narrow therapeutic window; CNS toxicity symptoms begin with tongue numbness, metallic taste, lightheadedness, tinnitus, progress to visual disturbances, twitching, unconsciousness, and seizures. CV toxicity at higher plasma level - arrhythmias, hypertension —> hypotension, conduction abnormalities
Magnesium (Anesthesia cart, ERAS/Spine packs)	Infusion: 6mg/kg/hr with 30mg/kg loading dose over 30-60 minutes.	• Potentiates neuromuscular blockade, can prolong emergence, can cause hypotension, bradycardia, prolonged PR or QT interval, burning/heat sensation in awake patient