

2019-2020 Resident Quality Improvement Project

Pediatric Update

Increasing Rates of Multi-Modal Analgesia

Inclusion Criteria

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

- Case duration \geq 1 hour
- General Anesthesia OR cases
- Non-transplant or cardiac surgery
- Non EUAs, ABRs, pedi dental cases
- Non ICU pts going to OR
- Pts age \geq 6 mo through $<$ 18 yrs of age

In our project, using 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

Pre-operative Medications

- Acetaminophen (PO)
- Gabapentin

Anesthetic Techniques

- Peripheral nerve block or catheter
- Epidural catheter
- Caudal
- Spinal

Intra-operative Medications

- Acetaminophen (IV)
- Dexamethasone
- Dexmedetomidine infusion or bolus

- Ketamine infusion or bolus
- Ketorolac

Medication	Dosing	Considerations
Acetaminophen (Pharmacy)	IV: 10-15mg/kg, max 75mg/kg/24hrs	<ul style="list-style-type: none"> Adjustment for hepatic disease/cirrhosis: max <2gm/day Adult dosing for patients >50kg: 1000 mg q6hr, max 4 gm/day Please consider ordering preoperative oral tablet or oral solution for teenage patients if appropriate
	PO: 10-15 mg/kg	
Gabapentin (Pharmacy)	For children >3 years	<ul style="list-style-type: none"> Adjustment for renal impairment based on creatinine clearance Can cause CNS depression, emotional lability, hostility and aggressive behaviors
	PO: 15 mg/kg, max 300mg per dose	
Dexamethasone (Anesthesia Cart)	Single dose: 0.5 mg/kg	<ul style="list-style-type: none"> Potential for immunocompromise and impairment of wound healing, 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 Bolus: 0.2-1mcg/kg over 10-20min	<ul style="list-style-type: none"> Commonly causes hypotension, bradycardia, transient hypertension (when given as bolus)
	Can carefully bolus over 10-20 min	
Ketamine (Drug Box)	Infusion: 2-5mcg/kg/min	<ul style="list-style-type: none"> 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)
	Bolus: 0.5mg/kg	
Ketorolac (Anesthesia Cart)	0.5-1mg/kg IV/IM, then 0.5mg/kg q6h	<ul style="list-style-type: none"> Increased risk GI side effects (dyspepsia, nausea, ulcers) if 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 Adult dosing: Single dose 15-30mg or 15-30mg q6hr, max 120mg/day (for 5 days)
Dosing for Caudal Epidural Blocks (Pharmacy, Regional Block Cart)	0.25% Ropivacaine 1mL/kg	<ul style="list-style-type: none"> Risk of intravascular or intraosseous injections leading to seizures and cardiac arrest Risk of subarachnoid injection causing total spinal block Risk rectal perforation causing needle contamination and subsequent sepsis
	0.25% Bupivacaine 1mL/kg	