

CHM Anesthesia Medication Guidelines

***All vials are single patient use. All opened vials should be properly labeled, dated and discarded after 24 hours unless otherwise labeled by pharmacy. Medications cannot be multi-dosed from a multi-dose vial if the vial is opened in a patient treatment area.

Sedative/ Hypnotics

Clonidine

IV bolus: 1-2 mCg/kg
caudal: 1-2 mCg/kg **must be preservative free

Dexmedetomidine (Precedex)

IV bolus: 0.2-0.5 mCg/kg- slow push
infusion: 0.2-1.4 mCg/kg/hr

Etomidate IV bolus: 0.2 mg/kg

Ketamine

IV bolus: 1-2 mg/kg
IM: 5-8 mg/kg
infusion: 0.1-0.2 mg/kg/hr

Lorazepam (Ativan) IV bolus: 0.02 mg/kg (max: 2 mg)

Midazolam (Versed)

IV bolus: 0.1 mg/kg (max: 2 mg)
PO: 0.5 mg/kg (max: 30 mg)
intranasal: 0.3 mg/kg of concentrated solution (max: 10 mg)

Propofol

IV bolus: 1-3 mg/kg
infusion: 50-300 mCg/kg/min

Propofol/ Ketamine (10:1)

infusion: 100-150 mCg/kg/min

Reversal (midazolam)

Flumazenil IV bolus: 0.01 mg/kg (max: 1 mg)

Opioids

Acetaminophen/HydroCODONE (Hycet) PO: 0.2-0.4 mL/kg

Fentanyl

IV bolus- pain: 1-2 mCg/kg
IV bolus- emergence delirium (PACU): 0.2-0.4 mCg/kg
infusion: 1-3 mCg/kg/hr

HydroMORPHONE (Dilaudid)

IV bolus: 0.01 mg/kg

Morphine

IV bolus: 0.05-0.1 mg/kg (max 2 mg/dose, may repeat)
IM: 0.2 mg/kg
infusion: 10-50 mCg/kg/hr
intrathecal: 5 mCg/kg (max: 250 mCg)
caudal: 50 mcg/kg

OXYcodone PO: 0.02-0.05 mg/kg (max: 5 mg)

Reversal

Naloxone (Narcan) IV bolus: 2-5 mCg/kg (max: 10 mCg/kg)

Analgesics

Acetaminophen (Tylenol, Ofirmev IV)

PO: 10-15 mg/kg
PR: 20-30 mg/kg
IV bolus: 12.5-15 mg/kg (max: 1 gm)

Ibuprofen (Motrin) 10 mg/kg PO

Ketorolac (Toradol) children ≥ 6 mos old

IV bolus: 0.5 mg/kg (max: 30 mg) Q6 hrs

Pediatric Spinal Fusions

Preoperative Assessment

History

- Determine the etiology, degree of spine curvature and location of curve.
- Idiopathic Scoliosis patients (typically older) usually lose less blood than neuromuscular scoliosis patients (typically younger). Patients on seizure meds have enzyme induction and ↑ blood loss.
- Review history of exercise tolerance, respiratory status, and any coexisting disease. Make sure that patient's comorbidities have been optimized.
- Examine the cardiorespiratory system, evaluate for the presence of tachypnea, crackles, wheezing, and signs of right heart failure.
- Preoperative neurologic deficits, if any, should be accurately recorded.
- Ask patient about pre-existing pain. Record that information. Inquire about any previously used pain medications.
- Explain to the patient and patient's family that family presence during induction will not be possible due to concerns about infection. If there is high anxiety of the patient, offer PO versed (0.5-1 mg/kg, 20-30 min required for maximum effect).

Pre-op Coaching

- Talk about pain (duration- approximately 2-3 wks), medications used to treat it, non-pharmacological techniques, side effects of pain meds. Setting expectations right help with patient management after the surgery. PCA usually for 2-3 days. Discuss PCA/Opioid infusion- determine which is better for your patient. Mention that patient will be followed by Acute Pain Service. Mention spinal, if planned.
- Facial swelling- patients develop it after this surgery.
- Red marks/pressure sores- from tape, padding, and monitors.

Pre-op Labs

- Based on the etiology, severity of the curve and cardiorespiratory compromise: CXR, ECG, cardiac echo, PFTs, baseline ABGs, CBC, electrolyte panel, coagulation profile, LFT should be reviewed.
- Cardiorespiratory impairment is more likely in curves $\geq 65^\circ$
- FVC <30 may indicate a need for post op ventilation. Inform the patient, parents and surgeon of potential need for post op ventilation.
- Cardiology consult needed for neuromuscular scoliosis patients for evaluation of possible cardiomyopathy

Surgery for the Pediatric Cardiovascular Patient

Preoperative Assessment

1. Patient evaluation
 - a. understand anatomy and physiology
 - i. establish hemodynamic/ anesthetic goals
 - ii. previous surgeries/ interventions
 - b. outpatients seen by anesthesia and CT surgery the day before.
 - i. record baseline saturation, vital signs, check HCG (if applicable)
 - ii. review pre-eval, CT clinic note, chest x-ray, EKG, and recent labs
 - c. discuss with attending/ CV surgery
 - i. candidate for early extubation? (see Early Extubation Guidelines)
 - ii. preference for location of lines
2. Premedication- midazolam
 - a. IV: 0.1 mg/kg (max 4 mg)
 - b. oral: 0.5-1 mg/kg (max 30 mg)
 - i. for most patients >7 months
 - ii. typically ordered during pre-eval, confirm given

Room Setup

1. Confirm that fluid warmer, warming mattress turned on
2. Bring U/S to room with extra sterile probe covers.
3. Understand baby bed (hand crank for L/ R/ t-burg, foot pedal to raise/ lower)
4. Airway
 - a. patients <2 yo nasal straight ETT, cuffed or uncuffed. Over 2 yo consider oral ETT.
 - b. nasal: need small Magill, Afrin nasal spray, red rubber suction with lubricant (sized so fits in ETT), pre-cut ICU tape
 - c. older patients/ early extubation- cuffed oral ETT
5. Medications- see below
6. Suction (x2 for surgeon, x1 for anesthesia) with tubing and connectors
7. PIV- IVs and hotline are set up by OR nurse, add microclaves to all stopcocks
 - a. well functioning PIV (x1) unless redo then PIV (x2)
 - b. hotline is blood/ volume resuscitation line
 - c. OR nurses typically place IV's
8. Invasive lines- kits located in sterile core
 - a. perfusion will setup and zero pressure transducers
 - b. basic sterile line table often set up by nurse/tech (eye drapes, 4x4's)
 - c. add to line table:
 - i. ultrasound cover
 - ii. sterile blue towels
 - iii. chloraprep
 - iv. 22g/ 24g angiocaths (depending on staff)
 - v. 5 mL heparinized flush from pressure bag
 - vi. arrow wire, babywire available if needed
 - vii. 3-0 silk suture on a straight needle
 - viii. tegaderm x2
 - ix. gown (for CVP) and gloves
 - d. location preferences (confirm with surgeon)
 - i. sinus venosus ASD: femoral lines
 - ii. coarct and aortic arch: usually 2 arterial lines (R radial and a femoral)
 - iii. redo: usually LIJ CVP (RIJ is prepped into surgical field)

Pediatric Pain Service Guidelines

- I. The Pain Service provides 24/7 coverage for both acute and chronic pain patients.
 - A. Acute pain service nurse/pain phone.
 - B. After 3 pm, please consult the attending on call if you have questions about issues with the pain service. For advice on pain clinic patients you may call the pain attending.
 - C. Most after hours pain service calls are for new consults, inadequate pain control, opioid side effects, weaning of pain meds and advice on discharge meds.
- II. The list of current patients on the pain service can be accessed through the CORES Patient Sign Out List (See addendum 1). They can also be found in Cerner under "CH-Pain Patients".
- III. Any changes to medication orders should be cleared by the attending on service.
- IV. Please document on EMR all patient interactions and medication changes.
- V. Please add the following to your order set favorites:
 - A. Pediatric PCA
 - B. Pediatric Continuous Infusion
 - C. Pediatric Epidural Infusion
 - D. Pediatric Single Shot Caudal with Opioid

IV/Oral Bolus Medications

- I. Intravenous
 - A. Morphine 0.05- 0.1 mg/kg/dose Q4 hours PRN (max dose of 3 mg)
 - B. Dilaudid 0.01- 0.02 mg/kg/dose Q4 hours PRN (max dose of 0.5 mg)
 - C. Toradol 0.5 mg/kg/dose up to 30 mg Q6 hours ATC for a maximum of five days
 1. Do not use in children less than 6 months of age, children with kidney disease or those at risk for GI bleeding
 - D. Consider IV acetaminophen when appropriate.
 - E. Fentanyl is only used in the ICU
- II. Oral
 - A. Norco tabs or Hycet elixir
 - B. Oxycodone tabs and elixir
 - C. Oral acetaminophen
 - D. Motrin (Ibuprofen)
 - E. Gabapentin (per consult recommendations)
 - F. TCAs like Amitriptyline/Nortriptyline (per consult recommendations)

PCA

Always confirm that ONLY the patient is using the PCA.

- I. Morphine (1 mg/mL) or Dilaudid (0.2 mg/mL), equipotent doses as Dilaudid is 5 times stronger than morphine.
- II. Dosing guidelines (per kg basis)
 - A. Morphine
 1. Starting bolus (patient controlled button dose) 0.02 mg/kg
 2. Lockout 7-12 minutes, usually starting at 8 minutes, increase when weaning
 3. Continuous infusion if necessary, 0.005 mg/kg/hr to start
 4. 4-hr max 0.3 mg/kg/hr, may consider no limit for complex cases.
 - B. Dilaudid is 1/5 of the morphine dose, with similar lockout settings stated above.