Updated: July 2021. Electronic versions on go.unc.edu/psqi

ERAS Pediatric Spine Pathway

Pre-op & Intra-op Components

Pre-Admit

Screening & Optimization
- **Vital Signs, Height & Weight (BMI)**
- **Medications Documented**
- **Education provided during patient's clinic visit**

Radiology
- **Upright 4V Spine**
- **Supine stretch if >90°**

Treatments
- **Shower/bath at home with regular soap (Option: Chlorhexidine bath)**

Pre-op DOS

Pre-emptive Analgesia
- Gabapentin PO
  - <12yrs and/or <40kg: 15mg/kg
  - >12yrs and 40-59kg: 600mg
  - >12yrs and >60kg: 900mg
- Acetaminophen PO
  - <40kg: 15mg/kg
  - 40-59kg: 650mg
  - >60kg: 1000mg
- Methadone PO
  - 0.1mg/kg up to MAX initial dose of 5mg

PCS Nursing
- CHG wipes
- Underbody forced air warmer set to 38 degrees Celsius

Fasting and Carbohydrate Loading Guidelines
- Follow ASA NPO guidelines
- Allow for liberal clear carbohydrate consumption until 2 hours before surgery (inpatient) or scheduled arrival time (outpatient)
- Clear carbohydrate beverages include: Gatorade, vitamin water, apple juice (no protein containing liquids, no sugar free versions of above)

Intraoperative

**Midazolam given at discretion of ACT*

Patient Warming Strategy
- Raise room temp (68-72F) prior to patient arrival in OR
- Use active forced air warming device and warm IV fluids
- Place esophageal/foley temperature probe and begin monitoring ASAP

Anti-Emetic Prophylaxis:
- Dexamethasone 0.15 mg/kg IV (MAX 8mg)
- Ondansetron 0.1mg/kg (MAX 4mg IV)

Types, Doses, and Routes of Anesthetics Administered
1. TIVA with Propofol/Fentanyl infusion
   a. Fentanyl 1-2mcg/kg/hr
   b. Propofol 150-200mcg/kg/min
   c. Titrate infusions as needed for BIS goal 40-60
2. Tranexamic acid infusion
   a. 30mg/kg bolus over 20min (MAX 2g)
   b. 10mg/kg/hr infusion during case (MAX 1g/hr)
3. Once hardware is in place, decrease propofol infusion and turn fentanyl infusion off. After final MEP, turn off propofol infusion and start desflurane
4. Ketorolac 0.5mg/kg (MAX 15mg)

Antibiotic Therapy
- Betadine nasal swab to both nares after induction prior to positioning prone
- Cefazolin 30 mg/kg (MAX 2g) q4hrs (If allergy, discuss giving test dose unless reaction is anaphylaxis)
- If Cephalosporin allergy, Clindamycin 10mg/kg (MAX 900 mg) q6hrs
- Neuromuscular Spine
  a. Ceftazidime loading dose: 50mg/kg (MAX 2g) then 25mg/kg (MAX 1g) q3hrs intra-op x 3 doses
  AND
  b. Vancomycin 20mg/kg (MAX 1g) over 1 hour then every 8hrs x 2 doses

Mechanical Ventilation Strategy
- TV 8ml/kg IBW, PEEP 4, FiO2 minimal need to maintain >95% O2 Sat
- Recruitment breaths every 30 minutes

BP Goals
- MAP 65-75 during exposure, MAP >80 during correction
- Maintain SBP within 20% of baseline
- Nicardipine infusion 2.5-15mg/hr (MAX 15mg/hr)

OR Nitroprusside infusion 0.3-3mcg/kg/min
- Esmolol infusion 50-250mcg/kg/min as second line agent for patients refractory to Nicardipine/Nitroprusside

- Phenylephrine infusion: Start at 0.1mcg/kg/min and titrate as needed

Intraoperative Fluid Management Strategy

Generalized principles to limit excess crystalloid administration
- Intraoperative maintenance fluid based on IDEAL BODY WEIGHT
- Lactated Ringer's 3ml/kg/hr
- If hypotensive (MAP <20% baseline), bolus 5ml/kg of 5% Albumin (MAX 500ml), for a total dose of 2 boluses
- If hypotensive despite albumin boluses x2, start phenylephrine infusion

Transfusion Guidelines per ASA
- Maintain goal hemoglobin >7g/dL – unless symptomatic
- Transfuse autologous blood when available
- Discuss transfusion with surgeon prior to administration of blood products
- Administer 10ml/kg/dose or 1 unit/dose for children >30kg

PACU

- Avoid long-acting opioids
- PACU dose of fentanyl limited to 100mcg IV (MAX single dose 25mcg)
- Diazepam 0.05mg/kg/dose IV (MAX 2mg) prn muscle spasm
- Ondansetron 0.1mg/kg/dose prn nausea (MAX 4mg)
- Promethazine 3mg IV PRN refractory nausea (**MAX of 2 Doses**) only in PACU

ERAS Pediatric Spine Pathway:

Post-op Components

Floor	Service-Specific		Pain Management	Nutrition & GI Recovery	Early Mobilization	Drains and Lines
POD 0	•VS q4hr •Neurovascular checks q4hr •Braden q12hr •Inpatient consult for Case Management	•Continuous Pulse Ox & oxygen to keep O2 sats >93% •Strict Intake & Output q4hr including drains •Incentive Spirometry 10x/hr when awake •Check surgical dressing q shift & reinforce PRN •Zofran IV 0.1mg/kg IV (MAX 4 mg) q8h PRN for nausea/vomiting •Continue antibiotics from OR for 24hrs •Decadron 0.15mg/kg IV (MAX 8mg) q8hrs x 3 doses post-op (DR. STONE ONLY)	•Valium 0.1mg/kg IV (MAX 5mg) q4h PRN Muscle spasticity •Morphine 1mg/ml PCA bolus 0.03mg/kg IV (MAX 0.2mg) with lockout interval 8 minutes; 4hr dose limit 0.1mg/kg (MAX 4mg) •Acetaminophen q6hr scheduled (refer to pre-op DOS for dosage) <u>Optional</u>: •Morphine 0.05-0.1mg/kg IV (MAX 2mg) q4hr •Toradol 0.5mg/kg IV (MAX 15mg) q6hr	•Clear liquids - Advance as tolerated •Assess bowel sounds •Encourage gum chewing	•PT/OT evaluate and treat •Turn q2hr and PRN until patient is rolling independently •OOB to chair as tolerated	
POD 1	•VS q4hr – after 24 hours, transition to VS q8hr per floor routine •Neurovascular checks q4hr •Braden q12hr •AM Labs: Hemoglobin and Hematocrit	•Wean O2 to keep sats >93% •Strict Intake & Output q4hr including drains •Incentive Spirometry 10x/hr when awake •Discontinue IV Fluid when tolerating PO liquids without nausea/vomiting •Discontinue antibiotics after 24hrs •Discontinue Decadron after 3 doses post-op (DR. STONE ONLY) •Start Miralax 0.5g/kg PO daily (MAX 17g)	•Valium 0.1mg/kg IV q4hr PRN muscle spasticity transition to PO •Discontinue PCA Pump •Start Oxycodone 0.05-0.1mg/kg PO q4hr PRN (MAX 10mg) •Morphine 0.05-0.1mg/kg IV (MAX 2mg) q4hr for breakthrough pain •Gabapentin 15mg/kg (<20kg) or 300mg (>20kg) PO once daily at night •Continue Toradol (as above) x 4 doses then transition to Naproxen 250-500mg PO BID ○Famotidine 0.5mg/kg IV (MAX 20mg) BID if using Toradol	•Clear liquids - Advance as tolerated •Assess bowel sounds •Encourage gum chewing	•OOB to chair ad lib (at least TID) •Ambulate ad lib (at least TID) •Begin Stairs •Allow patient to shower with dressing ON prior to discharge	•Discontinue Foley if urine output >0.5ml/kg/hr AND PCA is discontinued
POD 2	•VS q8hr •Neurovascular checks q8hr •Braden q12hr	•Discontinue Pulse Ox if O2 sats >93% on RA and PCA pump discontinued •Strict Intake & Output q4hr including drains •Incentive Spirometry q2hr when awake •Discontinue IV if tolerating PO liquids •Continue Miralax 0.5g/kg daily (MAX 17g) •Consider docusate 50-100mg PO BID	•Continue pain management program until discharged	•Diet - Advance as tolerated •Encourage gum chewing •Consider Dulcolax suppository 5mg (<10 years) or 10mg (>10 years) PR PRN if bowel sounds present and no stool	•OOB to chair ad lib •Ambulate ad lib (at least TID) •Continue Stairs	•Discontinue Foley if not done on POD 1
POD 3+	•VS q8hr •Neurovascular checks q8hr •Braden q12hr	•Discontinue Pulse Ox if O2 sats >93% on RA and PCA pump discontinued •Routine Intake & Output including drains •Incentive Spirometry q2hr when awake •Discontinue IV •Continue Miralax and docusate		•Diet - Advance as tolerated •Encourage gum chewing •Consider Dulcolax suppository (as above) if bowel sounds present and no stool	•OOB to chair ad lib •Ambulate ad lib •Conquer stairs	
Discharge	**Criteria for Discharge:** •Tolerating diet and PO medication •Pain under control with PO medication •Meet physical therapy goals for discharge					

DISCHARGE OPIOIDS per Opioid Stewardship Program: Short Stay (<u>assuming standard 0.05-0.1 mg/kg of Oxycodone</u>): Posterior Spinal Fusion: 40 doses