



## Caring For The Adolescent Idiopathic Scoliosis Patient At Bristol Myers-Squibb Children's Hospital At RWJUH-New Brunswick

This document is for the nursing staff of BMSCH at RWJUH-New Brunswick to help guide the care of a patient undergoing correction of *Idiopathic Scoliosis* only. This care is driven from multiple disciplines including but not limited to the Pediatric Orthopedic Surgeons and residents, pre-op, intra-op and PACU staff, anesthesia and pain management teams, PICU and the Adolescent unit staff, as well as Child Life. All of these disciplines partner with the patient and family to gain the optimal outcome of spinal deformity correction and repair while preventing complications from surgery and hospitalization.

### Types of Scoliosis

**Congenital**-Present at birth, usually noted with congenital anomalies involving other regions than the spine, anomalies usually involve the urinary tract and cardiac, the curve tends to be rigid, therefore bracing is not successful.

**Neuromuscular**-Noted as a result of a neuromuscular condition such as spina bifida, cerebral palsy, post traumatic paralysis and spinal muscle atrophy.

**Idiopathic**-cause is unknown, 3 subtypes: Infantile (0-3 yrs), Juvenile (3-puberty), and Adolescent, which is the most common. The child is usually healthy, has a normal spine at birth and develops the curve during growth.

### Non-Operative Treatment

**Observation**-Depends on stage of maturation: menarche and skeletal age. Usually once menstruation starts, girls will complete their growth within two years. If curve is less than ten degrees and the child is still growing, they will need to see the doctor every 3-6 months until growth is complete

**Bracing-** Usually with curves greater than 25 degrees if pre-menarchal or not skeletally mature, a brace is used. Bracing is effective in the rapidly growing child, purpose is to maintain the curve and prevent further progression.

### **Operative Treatment**

For curves greater than forty five-fifty degrees, or curves that progress while wearing the brace.

### **Common Types of Surgical Procedures:**

**Posterior spinal instrumentation and fusion-** Most common type. Two rods, multiple screws and bone grafts are used. Procedure usually takes about four hours.

**Anterior release and instrumentation and fusion-** Fusion over a smaller area of the spine with preservation of lumbar motion. Procedure usually takes four to five hours.

**Anterior release with posterior instrumentation and fusion-**This procedure is used when the curve is stiff, large or kyphotic (bowing or rounding of the back), may be done in 2 stages.

## **Nursing Care of this patient begins with Preparation:**

### **Pre-op**

- Pre-op work up including X-rays, blood work, anesthesia consult
- Base line vital signs
- Height/weight
- Pre-op Education by Scoliosis Nurse Coordinator. Includes review of all post-op care provided by medical and nursing staff. Patient and family should be included in outlining desired goals associated with the procedure.
- Pt given a prescription for Gabapentin 100 mg tabs to start 2 days prior to surgery—usually one before bed 2 days prior to surgery and then one in am and pm on day before surgery
- Tour of care areas.
- Discussion of approximate length of stay and criteria for discharge
- Consideration of any possible discharge needs to be referred to outcomes management
- Obtain consent forms

All labs and X-rays reviewed by appropriate medical staff. Abnormalities need to be acted on.

### **Pre-op night phone call should include**

- Time to start fasting
- Pre-op medications
- Pre-op shower reminder
- Time to report to the hospital

### **Preoperative**

- Gabapentin 100 mg po x 1 on arrival to CSD with sip of water
  - To be ordered on a written order form by APN during preadmission visit
  - 100 mg Capsule is loaded in CRR7 Pyxis machine, RN to remove
  - For patients unable to swallow, contents of capsule may be dissolved in water

### **Intra-operative**

- Pts will now receive intrathecal opioid (Morphine 5-10 mcg/kg/dose – 0.75 mg max) after inductions of general anesthesia. If challenging spinal block or >15 minutes then abort and have surgeon place spinal or use IV Methadone 0.2mg/kg.

- Dexamethasone 0.15 mg/kg x 1 dose
- Acetaminophen IV 15mg/kg (max 1 gm) to be given during closure
- Cefazolin 30 mg/kg, up to 2 gm. Redose q 4 hours.

### Post-op Day 0 Nursing Care

- Pt will go directly to PICU from OR
- Hourly vital signs including pain assessment
- Hourly I&O
- Hourly Neuro/vascular checks
- CR monitor, IVF, PCA, SCDs, ankle rolls,
- A-line may be removed prior to being OOB
- O2 prn to maintain SpO2 greater than 94%, C&DB,
- I/S instruction and use hourly
- Chest tube for anterior approach
- OOB to chair in evening on POD 0
- May begin clear liquids as tolerated
- Encourage gum chewing to increase GI motility
- Log roll q 2hours
- Hourly leg exercises, ankle circles, knee bends, foot pumps
- Foley Catheter
- Rolled towels under heels for comfort

### Medications POD 0

- IV Fluids: D5W/0.9%NaCl + 20 meq/L KCl at maintenance

CALCULATION OF MAINTENANCE IVF	
BODY WT IN KG	ml/kg/day
0-10 kg	100 ml/kg/day
11-20 kg	1000 ml (for 1 <sup>st</sup> 10 kg) + 50 ml/kg each kg> 10
>20 kg	1500 ml (for 1 <sup>st</sup> 20 kg) + 20 ml/kg each kg> 20

- PCA to be ordered by pain service as bolus only, no continuous
  - Morphine 0.01-0.015 mg/kg bolus, 8 minute lockout (generally 0.5-1 mg)
  - OR
  - Hydromorphone 0.002-0.004 mg/kg bolus, 8 minute lockout (generally 0.1-0.2 mg)

- Acetaminophen 15 mg/kg (max 1 gram) IV q6h, stop after 4 times
  - Begin at least 6 hours after OR dose given
- Ketorolac 0.5 mg/kg (max 30 mg) IV q6h stop after 8 times
  - Begin 6 hours after OR dose given
- Administration times of ketorolac and acetaminophen should be staggered so that the patient is receiving one of them alternatingly at 3 hour intervals.
- Dexamethasone 0.15 mg/kg q 8hrs x 3 doses
- Ondansetron 0.1 mg/kg (max 4 mg) IV q6h
  - Begin 6 hours after OR dose given
- Famotidine 0.5 mg/kg (max 20 mg) IV q12h
- Docusate 100 mg PO bid start at 2200
- Senna (8.6 mg) 1 tablet PO qhs
- Bisacodyl 10 mg suppository PR qhs PRN abdominal distension
- Gabapentin 100 mg PO q8h start at 2200
- Cefazolin 25 mg/kg (max 1 gram) IVPB q8h x 6 doses
  - Begin 8 hours after last OR dose given
- PRN Meds
  - Diphenhydramine 1 mg/kg (flat dose 25-50 mg) IVPB q6h PRN itching
  - Diazepam 2.5-5 mg IV q6h PRN skeletal muscle spasms
    - **\*\*It is critical to differentiate patient pain secondary to muscle spasms – In these instances, diazepam should always be used preferentially before opioid for relief**
- Alternative options to consider for itching or N/V that is refractory to first line agents
  - Metoclopramide 0.25 mg/kg (max 10 mg) IVPB q6h PRN nausea/vomiting unresponsive to ondansetron
  - Nalbuphine 0.05-0.1 mg/kg IV q3h PRN pruritus unresponsive to diphenhydramine
  - Naloxone 0.25 mcg/kg/hr continuous infusion prn pruritus unresponsive to nalbuphine
  - Scopolamine patch can be considered for nausea/vomiting in patients > 12 years old

### **Post-op Day 1 Nursing Care**

- Transfer to adolescent unit after AM care
- H/H and BMP
- Vital signs q4 hours including pain assessment, now until discharge
- I&O q 4 hours

- Remove Foley
- Pulse ox, O2 prn, I/S, C&DB
- Progress diet as tolerated (no carbonated beverages—keep diet bland)
- Ambulate and up in chair 3-4 x/day
- Continue leg exercises

### **Medications POD #1**

- In morning, adjust PCA as needed by increasing PCA dose and/or decreasing lockout as intrathecal morphine wears off and patient begins to mobilize
- Change Acetaminophen from IV to PO q6h around the clock
- Change Famotidine from IV to PO
- Suspend PCA in afternoon/evening.
  - Start Oxycodone 0.15-0.2 mg/kg (max 5-10 mg) PO q4h prn pain
    - Oxycodone 5 mg q4h prn moderate pain
    - Oxycodone 10 mg q4h prn severe pain
  - Discontinue PCA after minimum of 4 hours if tolerating oral oxycodone
- As patient tolerates liquid diet, consider decreasing IV fluids to ½ maintenance

### **Post-op day 2 Nursing Care**

- H/H and BMP
- Adjust/wean IVF and PCA settings PRN
- Suspend PCA early if able to tolerate po pain meds
- Original or back dressing will be replaced with gauze and tegaderm
- Ambulate and up in chair 4-6 x/day
- Consider discharge home if discharge criteria met

### **Medications POD #2**

- Change Ketorolac IV to Ibuprofen 10 mg/kg/dose (flat dose 400-600 mg based on tablet size) PO q6h around the clock
- Continue scheduled Acetaminophen PO q6h around the clock
- Alternate times Ibuprofen/Acetaminophen so that one pain med is given staggered at 3 hour intervals
- Change Ondansetron from scheduled to PRN
- Change IVF to NS at KVO if patient tolerating diet

- Discharge medications prescriptions should be provided to the patient as follows:
  - Oxycodone q4h prn
  - Acetaminophen q6h around the clock
  - Ibuprofen q6h around the clock
  - Gabapentin 100 mg po TID until end of POD #5

### **Post-op Day 3 Nursing Care**

- Taper/discontinue PCA/IV fluids
- Ensure patient is able to transfer independently and negotiate stairs
- Discharge to home if discharge criteria met

### **Post-op Day 3 Medications**

- Fleet Enema or Polyethylene Glycol as needed

### **Criteria for Discharge**

- Patient can walk and transfer to bed/chair independently or with minimal assist from family
- Patient able to negotiate stairs independently
- Spinal and activity precautions understood by family and patient
- Tolerating regular diet
- Pain controlled with po meds only
- Discharge instructions understood by caregiver including signs and symptoms of infection, neurovascular complications, use of pain meds, follow up appointments.
- Parents are provided with contact phone numbers for follow up
- Prescriptions given
- Home activity restrictions continue: no lifting anything over 2 lbs, no bending and no twisting at the waist until cleared by your MD

### **Specific complication related to patients undergoing scoliosis correction and appropriate interventions:**

It is important for all staff taking care of this patient to recognize they are at risk of any possible complication arising from any surgery including bleeding, infection, and hemodynamic compromise.

### **Pulmonary**

Pneumothorax is a potential complication due to the proximity of the pleural space to the anterior thoracic spine. Post-op chest x-ray to be done and read in PICU.

Pneumonia-caused from lying flat for prolonged periods, decreased activity secondary to spinal precautions, anesthesia and opioid use. Interventions include log rolling q2 hours, Incentive Spirometry and C&DB every hour, early return to activity.

### **Neurovascular**

Paralysis/paresthesias due to spinal cord compression. Interventions include hourly neuro vascular checks for 24 hours and then q4 hours until discharge.

### **Blood Loss**

Surgery can result to moderate to severe blood loss. Interventions include monitor dressing for drainage with each log roll, reinforce dressing as needed, notifying orthopedic medical staff of bleeding, vs q hour for 24 hours and then q4 hour until discharge, monitor H&H POD #1 and 2, autotransfusion.

### **Electrolyte Imbalance**

Due to fluid and blood loss during surgery. Check BMP POD 1 and 2.

### **GI**

Secondary to disruption of nerves to the peritoneum, patients may have slow return to normal GI function. In addition, anesthesia and opioid use can decrease gastric activity resulting in nausea/vomiting or ileus. Interventions include monitoring for bowel sounds, gum chewing, gradual return to po intake, early return to activity and use of antiemetic prn. In the event of an ileus, NGT insertion.

### **GU**

UTI secondary to indwelling Foley Catheter. Interventions include the hospital's Foley care policy, and intermittent straight cath policy. Remove Foley AM of POD #1.

### **Skin Integrity**

Potential for breakdown secondary to prolonged bed rest. Interventions include using soft supports at all pressure areas, log roll q2 hours while in bed, rolls under heels, and early return to activity

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