# Spinal Fusion for Neuromuscular Scoliosis Care Guideline

**Inclusion Criteria:** Spinal Fusion for Neuromuscular Scoliosis

**Exclusion Criteria:** Spinal Fusion for Adolescent Idiopathic Scoliosis, Spinal Fusion for other indications

## Postoperative Assessment

- VS with BP and Pain Assessment per unit standards of care
- Neurovascular assessment with vital signs
- ICU: CVP, arterial line, cardio-respiratory monitoring
- Continuous pulse oximetry (while on PCA)
- Labs: Hgb/Hct daily x 3 d

## Postoperative Interventions

- IV Fluids as ordered
- Consult Pulmonary, if not completed preoperatively
- Respiratory Therapy: Supplemental low flow oxygen therapy to maintain SpO2 >92%. Optimal pulmonary hygiene; prevention of post op atelectasis
- Wound Care:
  Change Dressing per MD orders
  Note: If dressing soiled or bloody, change as soon as possible. If sutures or staples: Cleanse wound with CHG chlorascrub
- Sequential compression device x 3 days (continuously while in bed)
- Constavac suction as ordered; reinfusion per protocol
- D/C central line, arterial line, prior to transfer to floor
- Maintain foley catheter until discontinued by Ortho team

## Medication Management

- **Antibiotic Prophylaxis**
  Cefepime 50 mg/kg IV q8h x 24 hours (<40 kg)
  2000 mg IV q8h x 24 hours (>40 kg)
  **AND**
  Vancomycin 15 mg/kg IV q6h x 24 hours (<50 kg)
  1000mg IV q8h x 24 hours (>50 k)

  * If patient has drain 24 hours postop, start cefazolin (Ancef) 30mg/kg IV q8h until drain is removed

- **Pain Management (see page 3 of 4)**
  * Hydromorphone (Dilaudid) PCA continuous and/or demand
  * Breakthrough pain dosing per severity of pain
  * ***Do not order acetaminophen/hydrocodone (Norco) around the clock. Order PRN***

  **POD 0:**
  * With surgeon approval, start ketorolac tromethamine (Toradol) IV q6h x 48h

  **POD 1-2**:
  * Patients HOB needs to be elevated at least 30°
  * **NPO until POD 2*(recommendation).** If PO fed, see page 2 under Dietary/Clinical Nutrition. Only begin feeding when bowel sounds are present and abdomen is soft. See pages 4 and 5 for enteral feed guideline. ***Once patient is tolerating feeds, begin PO/GTT pain medication***
  * After tolerating initial pain medication dose, taper PCA Continuous until discontinued
  * After 48 hours, all pain meds should be transitioned to oral/GTT route
  * CAUTION: No acetaminophen PRN order if taking oral opioids containing acetaminophen
  * Start gabapentin (Neurontin) PO/GTT TID when patient is tolerating feeds.

  **POD 3:**
  * Continue transition off IV pain medication
  * Evaluate daily to transition from around the clock oral pain medication to PRN dosing

  **POD 3-4:**
  * Monitor response to being off IV pain meds x 24 h

- **Antiemetic**
  Ondansetron 0.1 mg/kg/dose IV q8h prn (<40kg); 4 mg IV q8h prn (> 40kg)

- **Stool Softener/Laxative**
  * Assess, daily, potential need related to opioid use for pain management
  * Add polyethylene glycol (Miralax) once PO/GTT feeds start. If no stool within 24hrs of starting feeds, give bisacodyl (Dulcolax) suppository.
  * Patient needs to stool *at a minimum* of every other day



Approved Evidence Based Me1icine Committee
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# Spinal Fusion for Neuromuscular Scoliosis Care Guideline

**With this patient population, there is an increase risk of aspiration due to scoliosis acting as a pseudo fundoplication. The spinal fusion changes the anatomy, inherently acting as the undoing of a fundo. There is recommendation to commence and proceed with caution when beginning refeeding.**

## Activity/PT

- 1st 12 hours: Strict bedrest; keep flat (log rolling okay if cleared by MD)
- After 12 hours: May elevate HOB, as tolerated. Nursing to initiate this even if patient is intubated.
- **POD 1:** PT evaluation in the A.M. (may be postponed to POD day 2, depending on patient's clinical status, for example neurosurgery patients)
- **POD 1-3:** Progress as tolerated with out of bed activity under supervision of PT

## Recommendations/ Considerations

- Notify ortho team prior to blood transfusion if Hgb >7 and patient asymptomatic of anemia
- Consider Infectious Disease, Neurology, Nutrition, Pain, Pulmonary, RT, and Dental consults
- Indications for extending antibiotic prophylaxis beyond 24 hours post op described in CHOC Children's "Antibiotic Prophylaxis for Surgery Guideline"
- Parent note to be given on discharge for return to CCS for PT/OT re-evaluation and wheelchair evaluation for adjustments.
- Central line care – Refer to Patient Care Policy F832 Central Venous Access Device (CVAD)
- Pain Management - Refer to Patient Care Policy F918 - Pain Management; Policy F684 - Organizational Pain Policy; Policy F886 - Pain Assessment Scales

## Dietary/Clinical Nutrition

- **POD 0-1:** NPO for at least 36 hours post-op
  - * Exceptions: seizure medications and baclofen; if GTT: meds only by GTT during NPO status
- **POD 2:**
  - * ***PO fed:*** If bowel sounds present and abdomen is soft begin clear liquids; advance as tolerated to pre-procedure diet.
  - * ***Enterally fed:*** Clarify home tube feeding schedule. If bowel sounds present and abdomen is soft – begin per feeding guideline on pages 4 and 5

***** For all PO/GTT feeds, patient must have HOB elevated to at least 30° ******

- Advance per Enteral Guideline, if applicable (see pages 4 and 5)

## Discharge Criteria

- Off all IV pain meds x 24 h
- Pain controlled with oral/GTT pain meds only
- Tolerating pre procedure diet
- Meets PT d/c criteria (family/ caregiver independent assisting with mobility at home)
- Normal VS
- Returned to prior bladder function
- Bowel function addressed
- Discharge home on gabapentin (Neurontin)

## Patient/Family Education

- "Neuromuscular Instrumentation Discharge Instructions" (located on PAWS, Patient and Family Education)
- Instruct family on SSI, CAUTI, CLABSI, and VAP
- Keep dressing on for 2 weeks, until seen by MD. If dressing becomes soiled, call MD.

## Dilaudid (Hydromorphone)

***Loading dose for pain score ≥ 4:***

* <50 kg: Dilaudid (Hydromorphone) 0.01mg/kg one time prior to starting PCA
* 50 kg or >: Dilaudid ( Hydromorphone) 0.5mg one time prior to starting PCA

***Dilaudid (Hydromorphone) continuous and/or demand PCA***

* <50 kg: continuous rate: 0.002 – 0.003 mg/kg/hr; demand dose: 0.003-0.004mg/kg/dose
* 50 kg or >: continuous rate: 0.1 – 0.2 mg/hr; demand dose: 0.2 – 0.3 mg/dose
  PCA lockout time: 10 minutes

***Breakthrough pain dose***

* <50 kg: Dilaudid (Hydromorphone) 0.004mg/kg IV q2h prn moderate pain (4-6)
* <50 kg: Dilaudid (Hydromorphone) 0.008mg/kg IV q2h prn severe pain (7-10)
* 50 kg or >: Dilaudid (Hydromorphone) 0.2mg IV q2h prn moderate pain (4-6)
* 50 kg or >: Dilaudid (Hydromorphone) 0.4mg IV q2h prn severe pain (7-10)

***Maximum hourly infusion: based on continuous and demand doses***

## Acetaminophen IV

* <50 kg: Acetaminophen 15 mg/kg IV q6h for 3 doses
* 50 kg or >: 1,000 mg IV q6h for 3 doses

# Continuous Enteral Feeding Guideline (NPO until POD #2 & Keep Head of Bed > 30°)

## Continuous Feeding Advancement Protocol

Initiate home formula or formulary therapeutic substitution at full strength running at 25% of usual/goal rate.
**Check residuals every 4 hours using Residual Algorithm.**

(increase after 8 hrs)

Increase to 50% of usual/goal rate.
**Check residuals every 4 hours using Residual Algorithm.**

(increase after 8 hrs)

Increase to 75% of usual/goal rate.
**Check residuals every 4 hours using Residual Algorithm.**

(increase after 8 hrs)

Increase to 100% of usual/goal rate.
**Check residuals every 4 hours x2 using Residual Algorithm.**

## Residual Algorithm

Check residuals every 4 hours.

**Residual < 200% of current rate**

Maintain current rate or advance to next step in protocol for residuals < 2x current hourly rate.

**Residual > 200% of current rate**

If residual is > 2x current hourly rate, hold feed for 1 hour and recheck residual.

If residual after 1 hour is ≤ current hourly rate, resume feeds.

If residual is > current hourly rate, contact physician

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# Bolus/Intermittent Enteral Feeding Guideline (NPO until POD #2 & Keep Head of Bed > 30°)

## Bolus/Intermittent Feeding Advancement Protocol

Initiate home formula or formulary therapeutic substitution at full strength running at 25% of usual/goal bolus volume. Repeat this for a total of 2 feeds. **Check residuals before each feeding using Residual Algorithm.**

(increase after 2 feeds)

Increase to 50% of usual/goal bolus volume. **Check residuals before each feeding using Residual Algorithm.**

(increase after 2 feeds)

Increase to 75% of usual/goal bolus volume. **Check residuals before each feeding using Residual Algorithm.**

(increase after 2 feeds)

Increase to 100% of usual/goal rate. **Check residuals x2 feedings using Residual Algorithm to ensure tolerance.**

## Residual Algorithm

Check residuals before each bolus/intermittent feeding.

**Residual < 75%**

Maintain current bolus volume or advance to next step in protocol for residuals < 75% of previous bolus.

**Residual > 75%**

If residual is > 75% of previous bolus, hold feed for 1 hour and recheck residual.

If residual after 1 hour is ≤ 50% of previous bolus, resume feeds.

If residual is still > 50% of previous bolus, contact physician

**With this patient population, there is an increase risk of aspiration due to scoliosis acting as a pseudo fundoplication. The spinal fusion changes the anatomy, inherently acting as the undoing of a fundo. There is recommendation to commence and proceed with caution when beginning refeeding.**

## References

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