Clinical Pathways

Post-Operative Tethered Cord Patients

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MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

BEST CHILDREN'S HOSPITAL WOMEN'S CHOICE AWARD 2023

What is a Clinical Pathway?

- An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective and consistent patient care.

Objectives of Pathway

- To improve and standardize post-operative care of the patient undergoing tethered cord surgery
- To eliminate variability and establish a standard of care for these patients

Why do we need this pathway?

- To change practice for post operative care of these select group of patients
- To guide care for these children
- To ensure standard of care is successfully implemented for the safety of the patient

What is Tethered Cord?

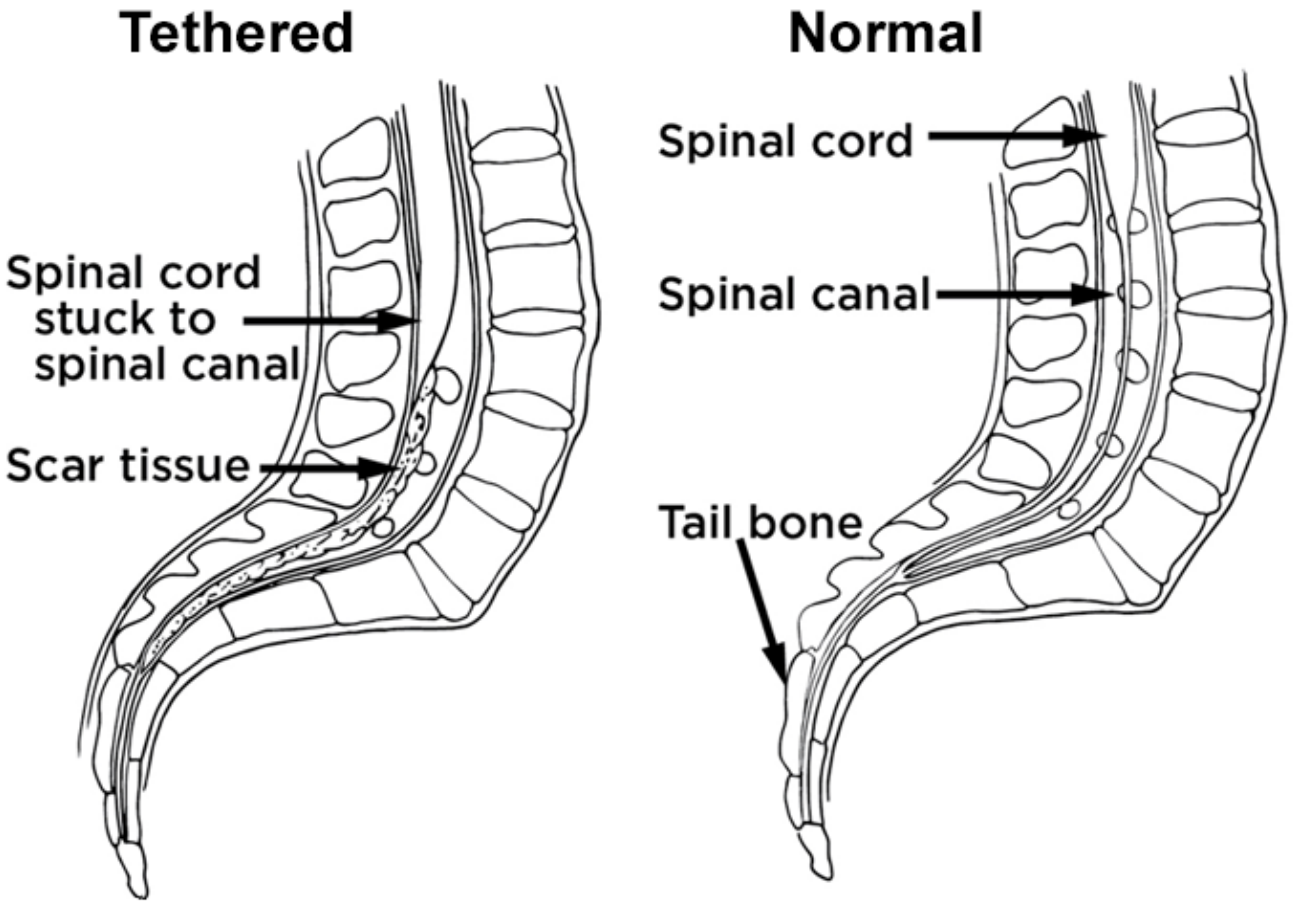


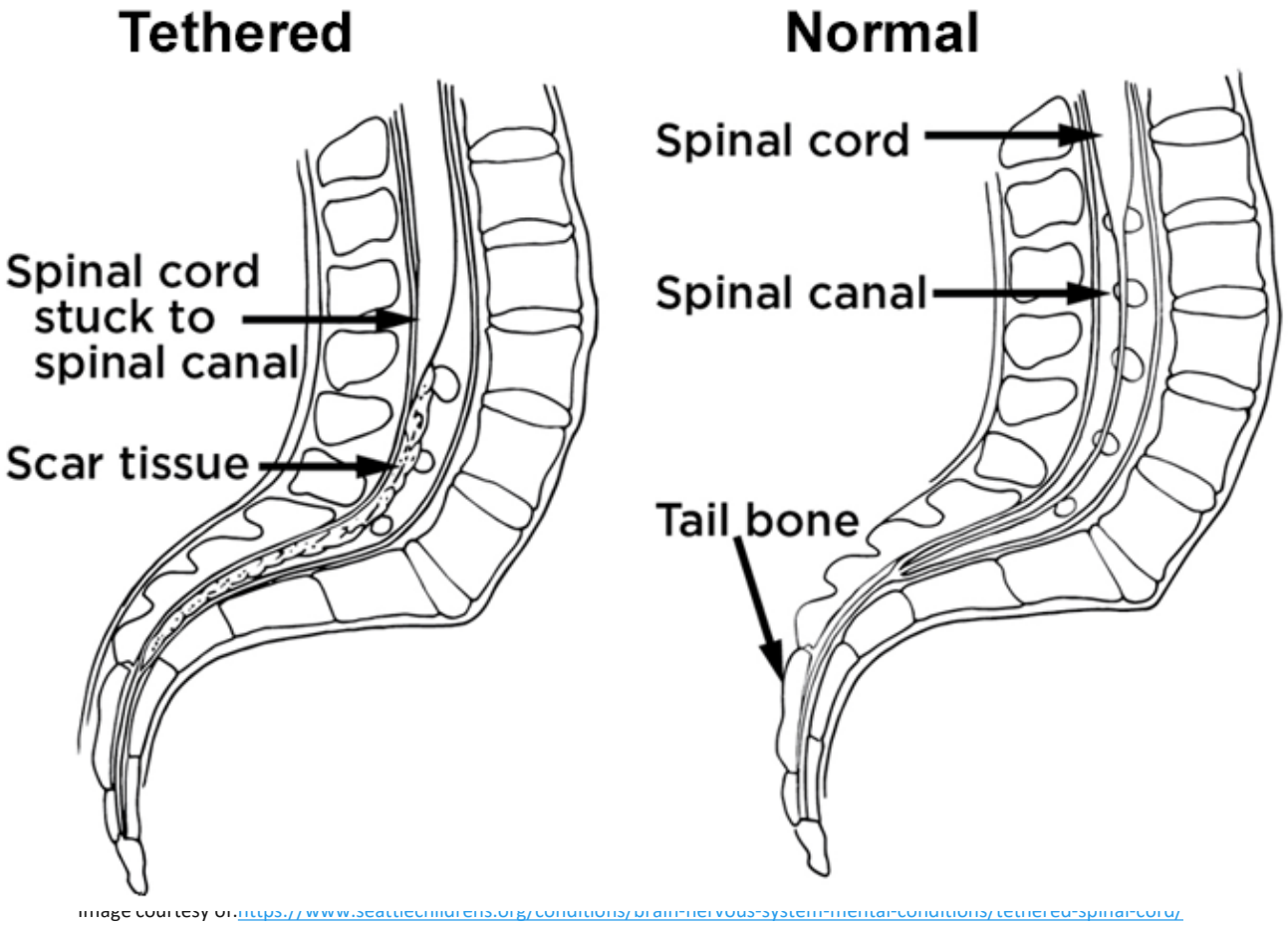
Image courtesy of: https://www.seattlechildrens.org/conditions/brain-nervous-system-mental-conditions/tethered-spinal-cord/

- Tethered cord occurs when the spinal cord is attached to tissues around the spine, most commonly at the base of the spine.
- The attached tissue limits the movement of the spinal cord within the spinal column and causes an abnormal stretching of the spinal cord and impairment of blood flow to the nerve tissue.
- Can be closely associated with spina bifida

OR

- Can occur as an independent entity related to disorders of secondary neurulation and some tumors.

What is Tethered Cord?



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- The lower tip of the spinal cord (conus medullaris) is normally located opposite the disc between the first and second lumbar vertebrae.
- With tethered cord, the conus medullaris may be located below the interspace between the second and third lumbar vertebrae, and/or there may be radiographic evidence of abnormal points of attachment (i.e. thickened filum terminale, intraspinal mass, spinal cord adjacent to thecal sack in a fixed position).

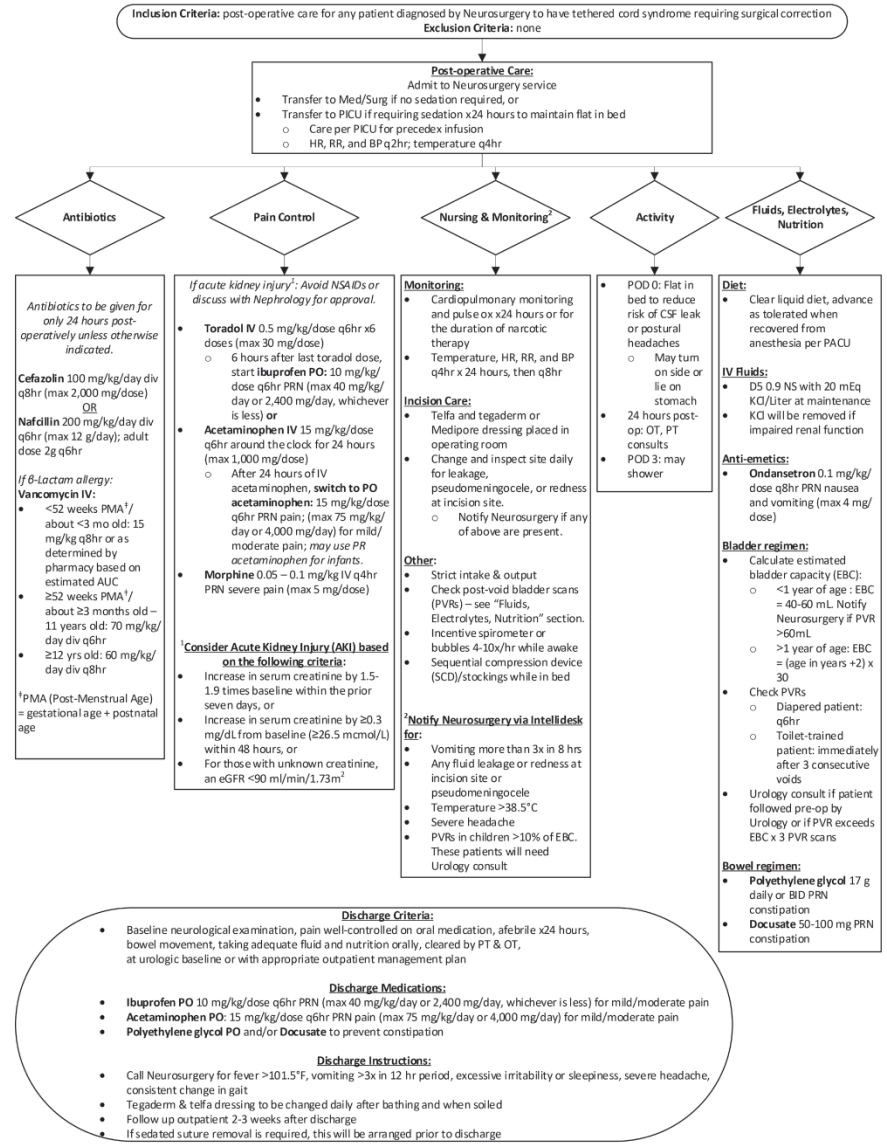
This is the Post Operative Tethered Cord Clinical Pathway.

We will be reviewing each component in the following slides.

CLINICAL PATHWAY:

Post-Operative Tethered Cord

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.



CONTACTS: PETRONELLA STOLTZ, APRN, DNP | MARKUS BOOKLAND, MD | JONATHAN MARTIN, MD

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CLINICAL PATHWAY:

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This pathway is specifically for patients who have tethered cord that required surgical correction.

Inclusion Criteria: post-operative care for any patient diagnosed by Neurosurgery to have tethered cord syndrome requiring surgical correction
Exclusion Criteria: none

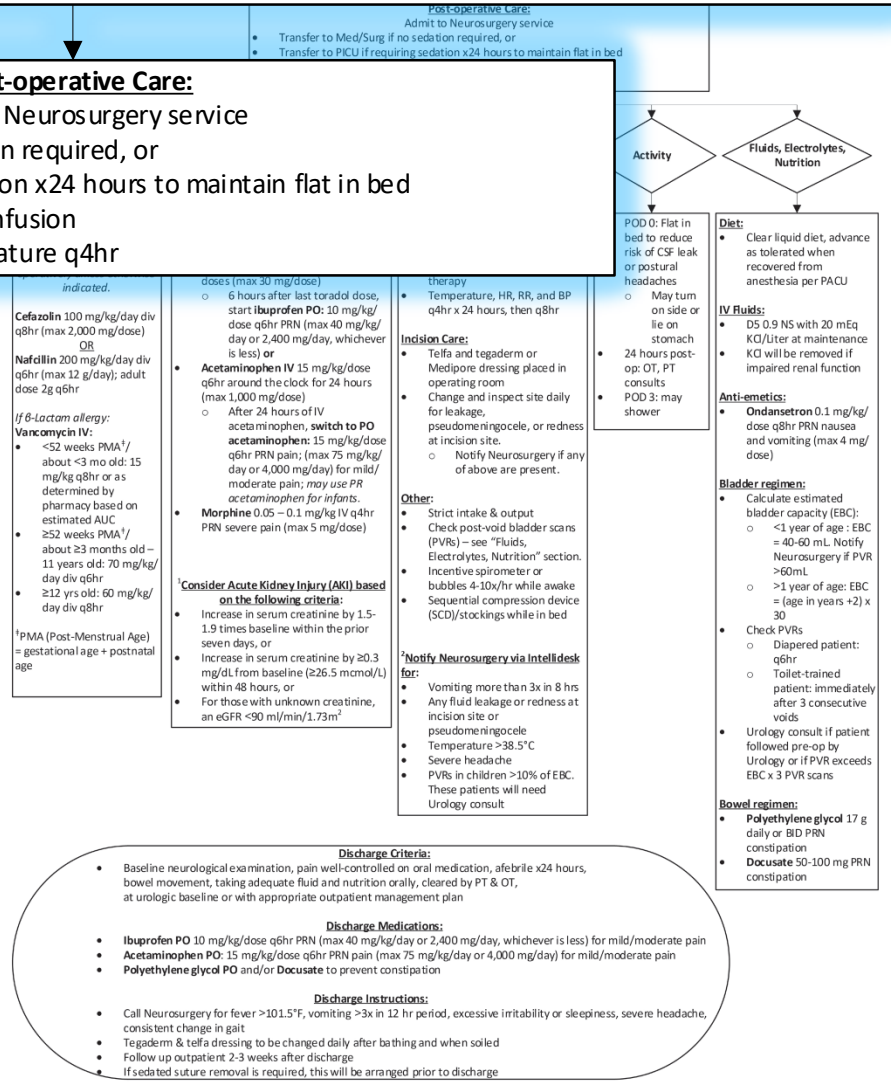
Post-operative Care:

Admit to Neurosurgery service

- Transfer to Med/Surg if no sedation required, or
- Transfer to PICU if requiring sedation x24 hours to maintain flat in bed
  - Care per PICU for precedex infusion
  - HR, RR, and BP q2hr; temperature q4hr

Patients need to be flat in bed for 24 hours post procedure.

- Some patients will require PICU admission for sedation with precedex during this initial period of recovery.
- Most children can then transfer to the Med/Surg unit after 24 hours.



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CLINICAL PATHWAY:

Post-Operative Tethered Cord

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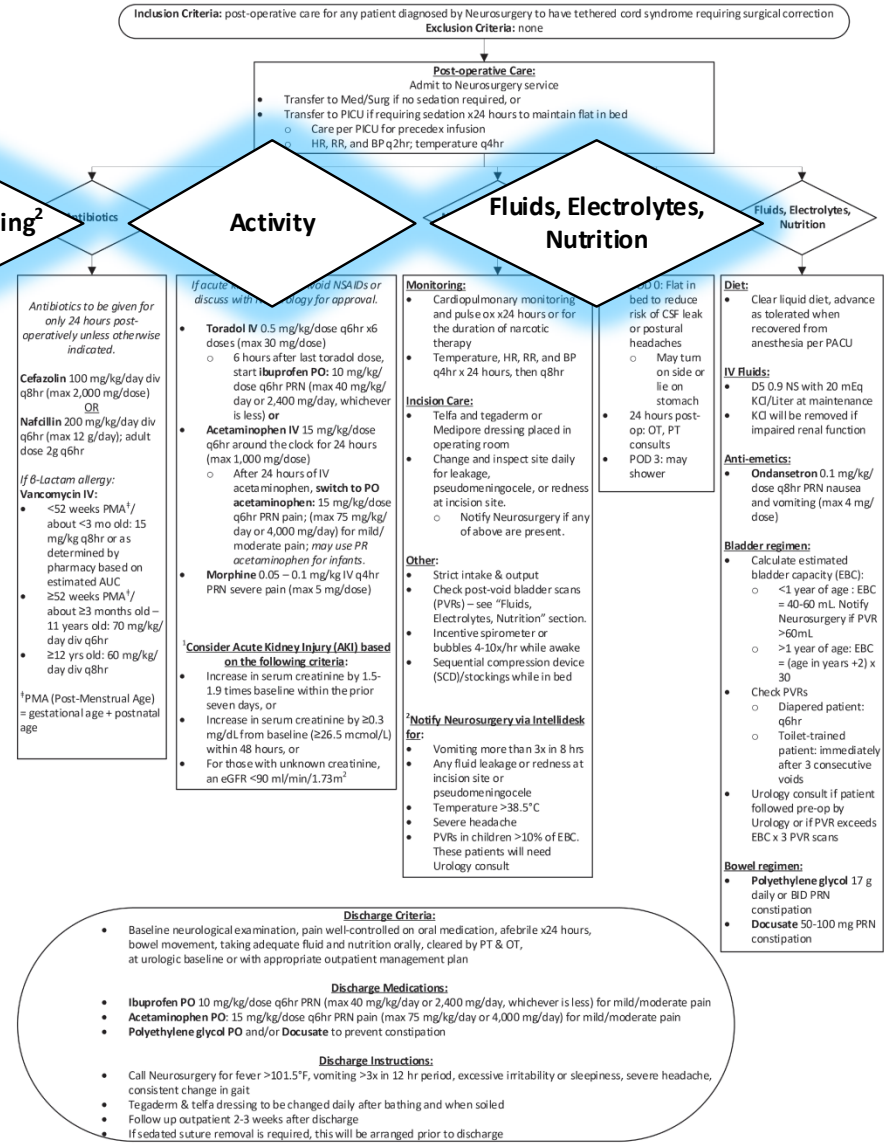
Antibiotics

Pain Control

Nursing & Monitoring[2]

Standardized care for these patients includes five different categories.



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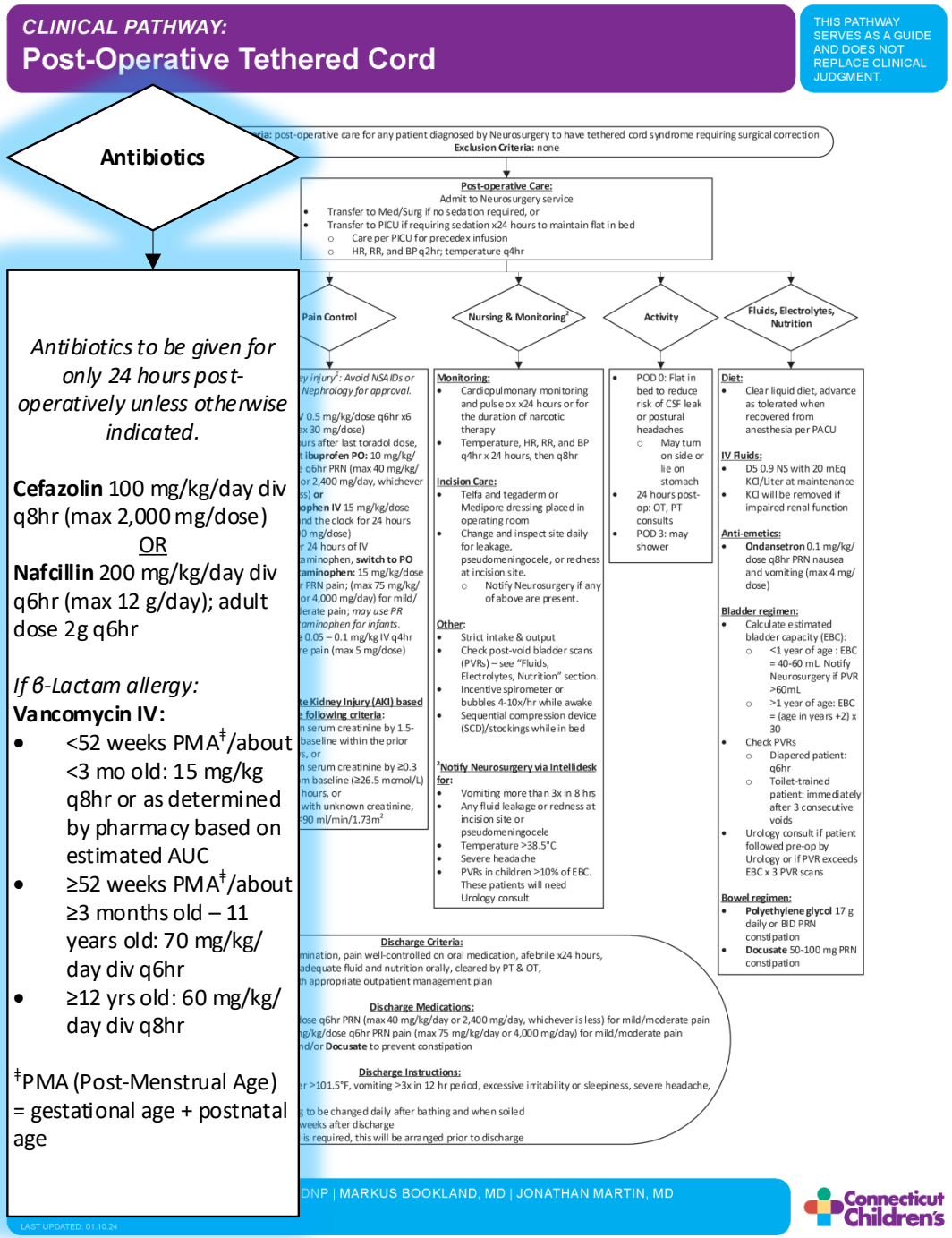
All children will receive antibiotics for the first 24 hours post procedure.

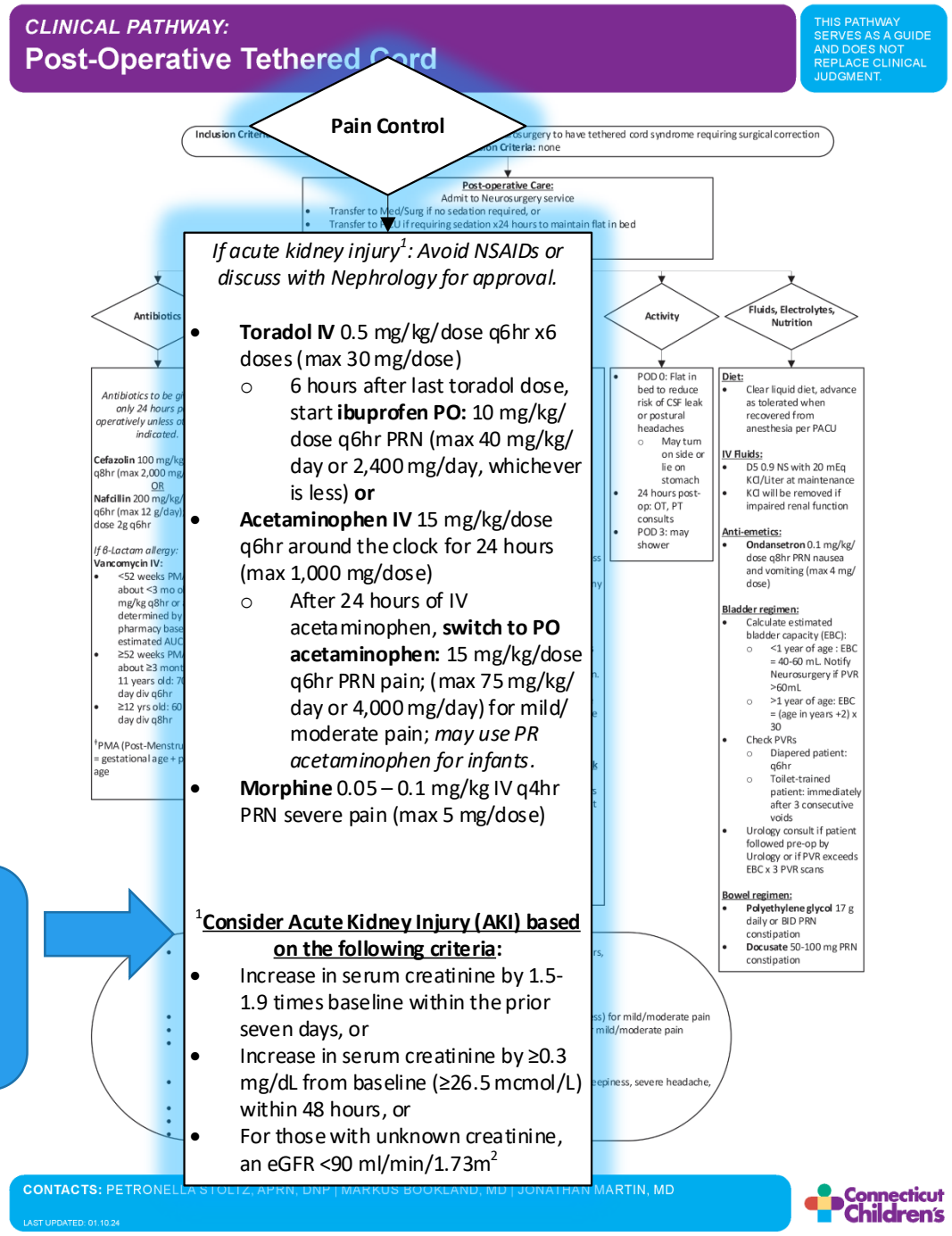
- There is no indication for routine administration of antibiotics beyond 24 hours.



NSAIDs, such as Toradol, are an important part of post operative pain management.

- Children with known renal impairment should only get NSAIDs after discussion with Nephrology

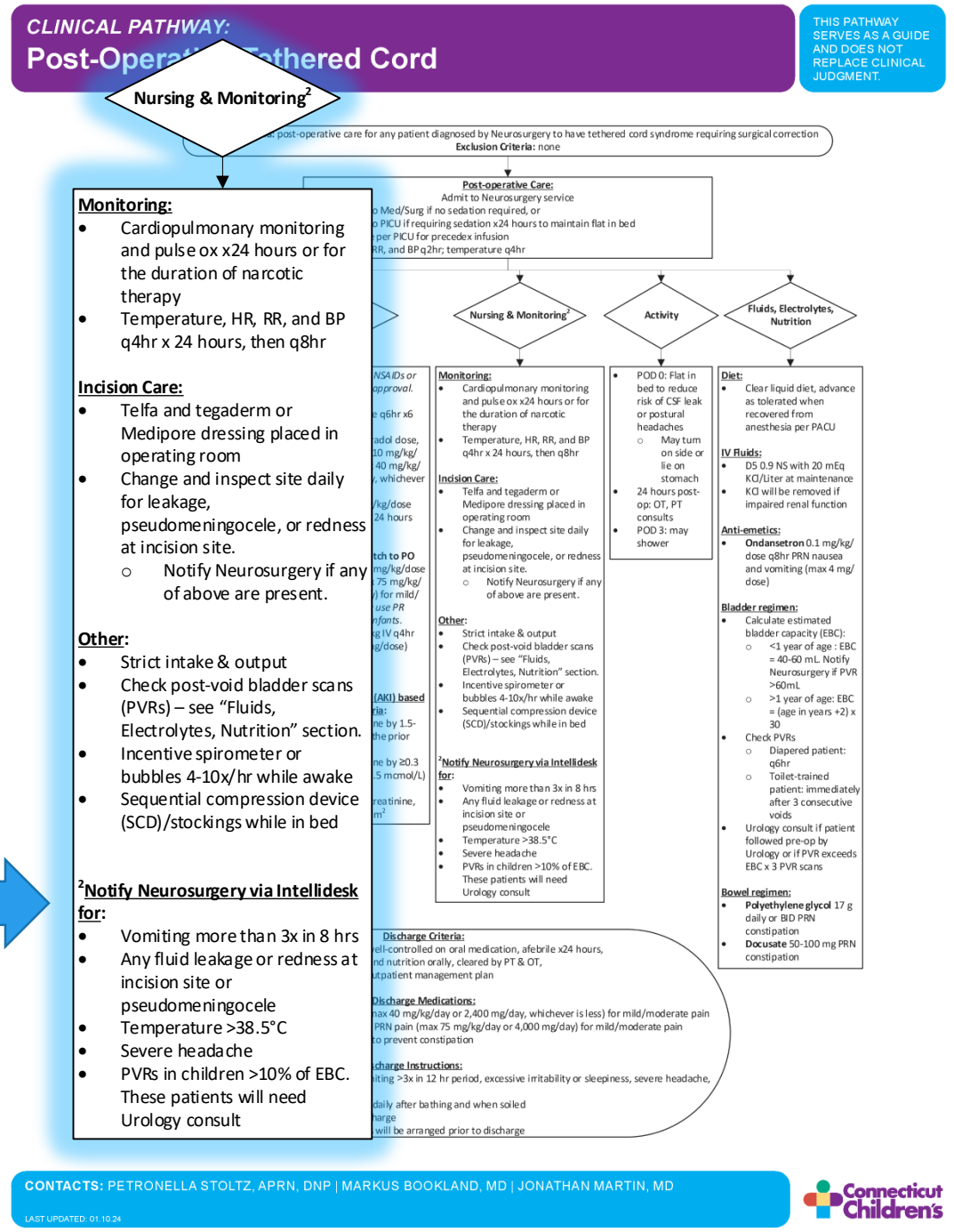
Note: the definition of AKI has been updated and is available at the bottom of the box.



Nursing care includes both routine vital sign monitoring, incentive spirometry, and venous throbmo-embolism (VTE) prevention.

The surgical incision should be closely monitored.

Neurosurgery should be notified of any fluid leakage from the incision



Patients will be on bedrest with the bed flat for the first 24 hours after surgery.

- Once patient is allowed to sit up, RN should evaluate for headaches. If a patient experiences a severe headache, they should return to having the head of bed (HOB) flat then gradually increase the HOB over several hours.

Early PT and OT consults are important to help reduce the risk of complications that may result from immobility.

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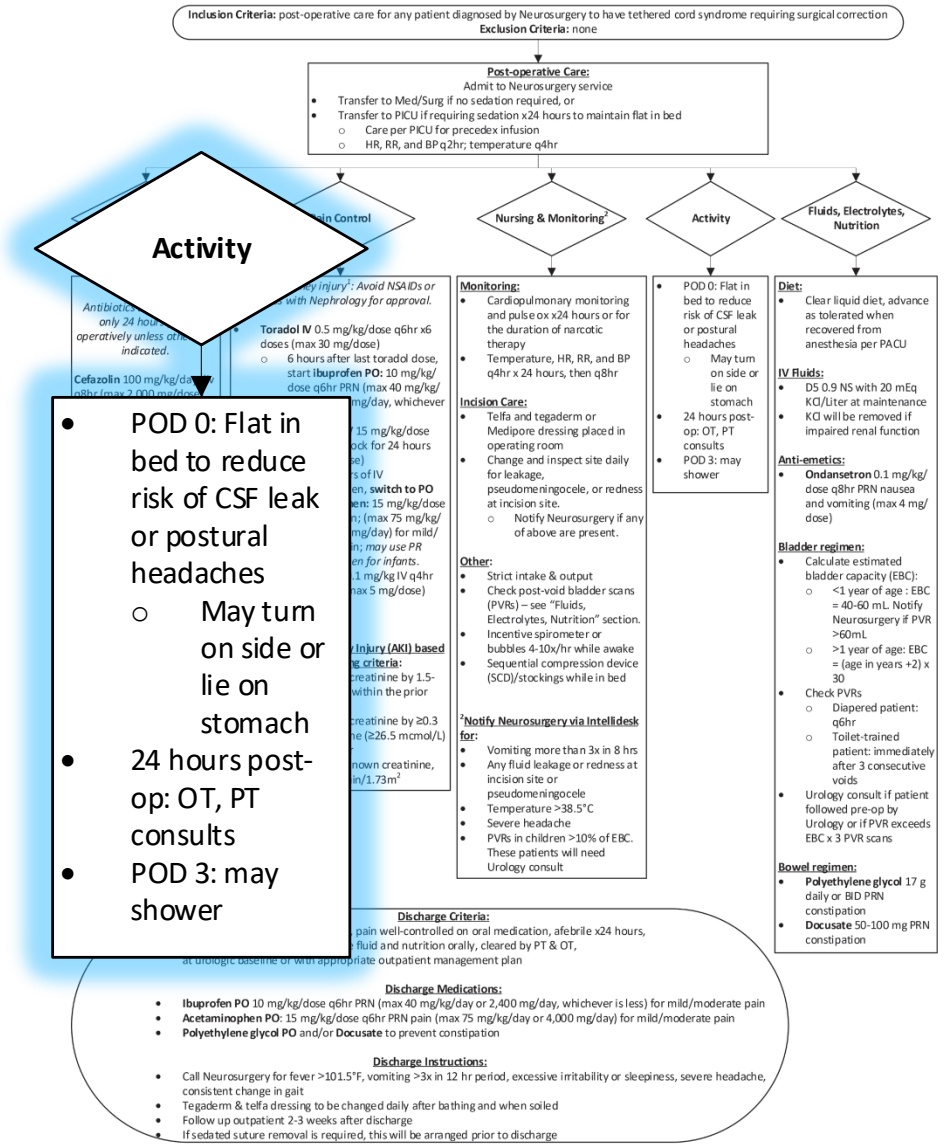

- POD 0: Flat in bed to reduce risk of CSF leak or postural headaches
  - May turn on side or lie on stomach
- 24 hours post-op: OT, PT consults
- POD 3: may shower

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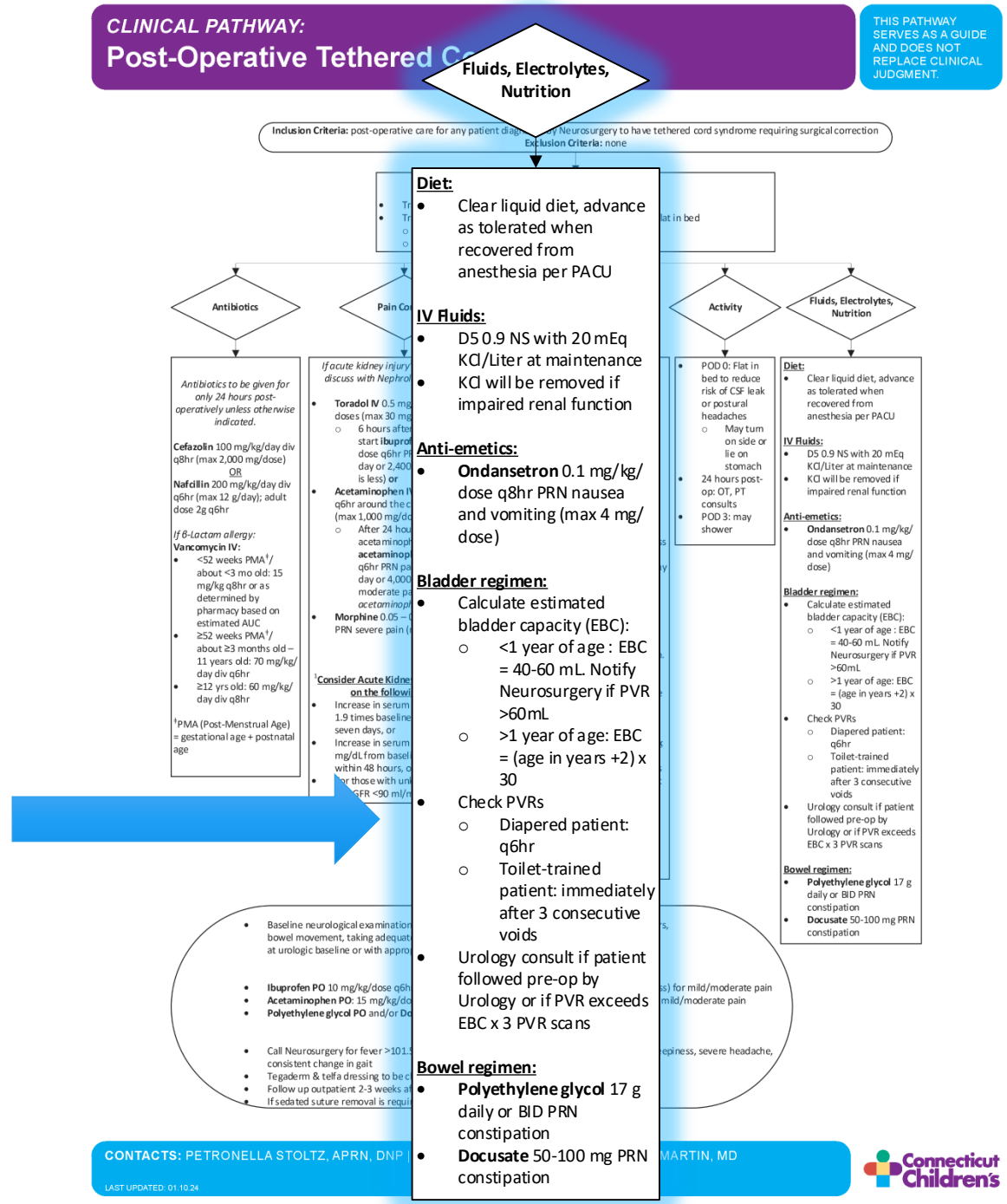
Children will come out of the OR with a foley catheter in place. Once the foley catheter is removed, post void residuals (PVR) need to be checked and documented in the medical record.

- Patients with PVR greater than 10% of their estimated bladder capacity will need a urology consult
- Urology is also consulted for patients with preexisting bladder dysfunction

Other things to note related to Fluids, Nutrition, and Electrolytes:

- Bowel regimen is initiated immediately post op



CLINICAL PATHWAY:

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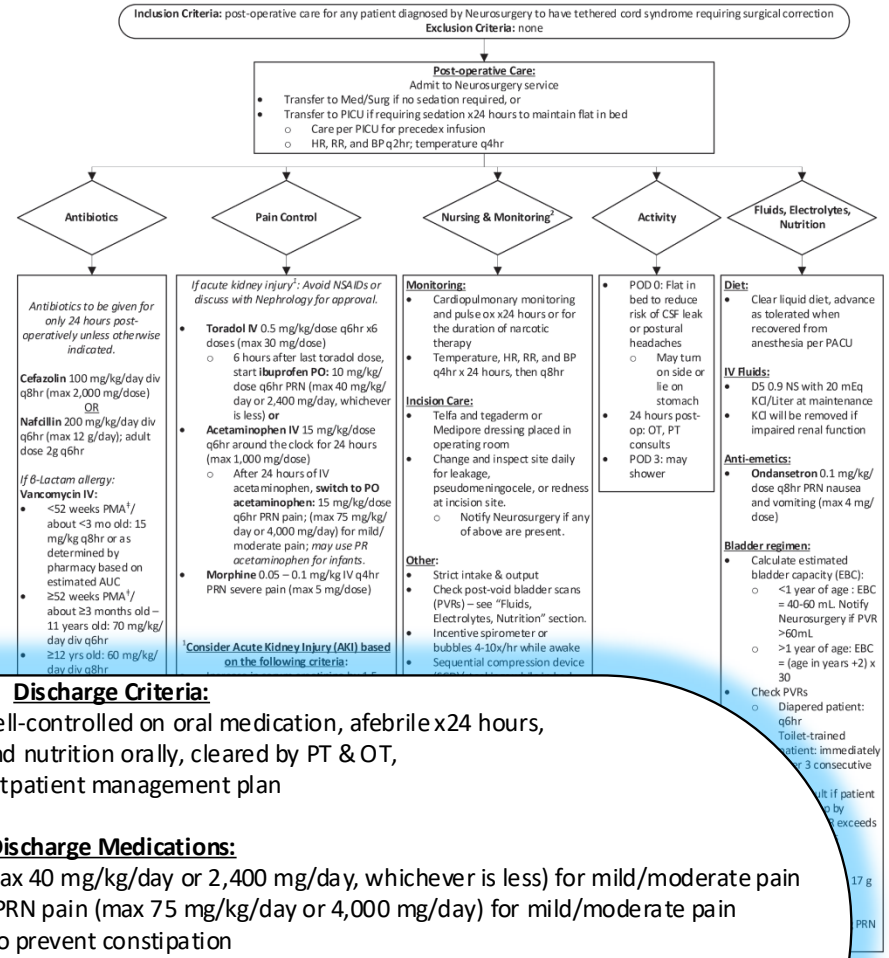
Children criteria, medications and instructions (including when to call neurosurgery once discharged) are clearly outlined.



Discharge Criteria:

- Baseline neurological examination, pain well-controlled on oral medication, afebrile x24 hours, bowel movement, taking adequate fluid and nutrition orally, cleared by PT & OT, at urologic baseline or with appropriate outpatient management plan

Discharge Medications:

- **Ibuprofen PO** 10 mg/kg/dose q6hr PRN (max 40 mg/kg/day or 2,400 mg/day, whichever is less) for mild/moderate pain
- **Acetaminophen PO**: 15 mg/kg/dose q6hr PRN pain (max 75 mg/kg/day or 4,000 mg/day) for mild/moderate pain
- **Polyethylene glycol PO** and/or **Docusate** to prevent constipation

Discharge Instructions:

- Call Neurosurgery for fever >101.5°F, vomiting >3x in 12 hr period, excessive irritability or sleepiness, severe headache, consistent change in gait
- Tegaderm & telfa dressing to be changed daily after bathing and when soiled
- Follow up outpatient 2-3 weeks after discharge
- If sedated suture removal is required, this will be arranged prior to discharge

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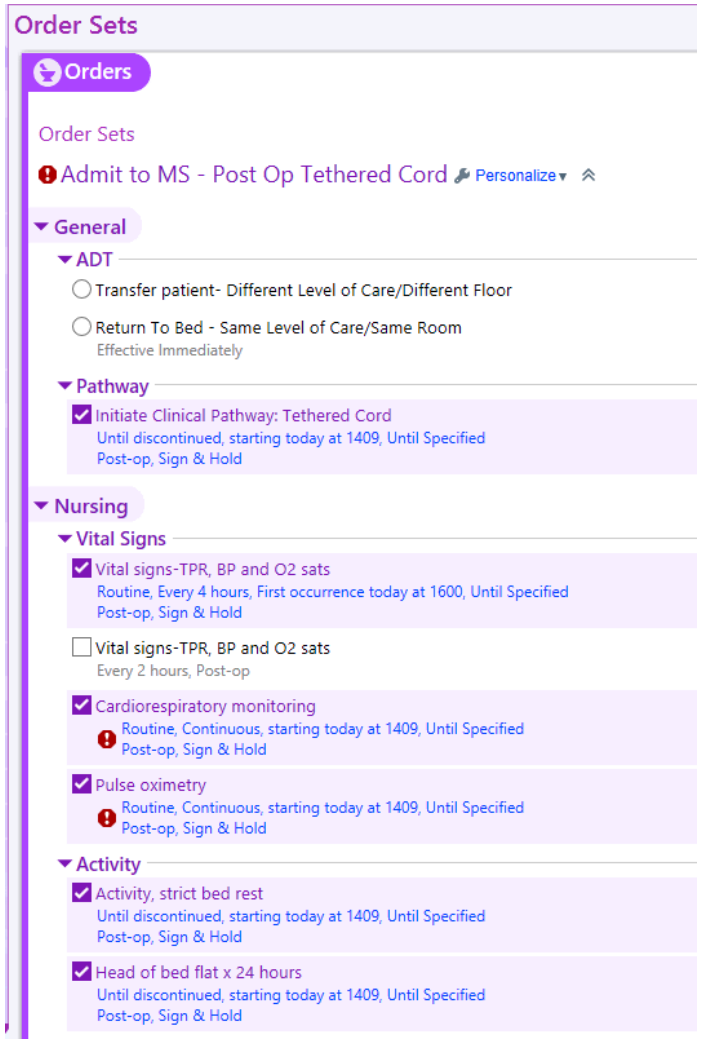
Review of Key Points

- If patient requires Precedex then patient requires admission to PICU
- No BLOOD WORK required for patient post operatively unless unstable
- Pain Control
- Antibiotics x 24 hours
- Notify NS attending for any bleeding, instability or wound drainage immediately
- PVR are essential once foley is out
- If PVR are significant (see algorithm in pathway) Urology consult is indicated

Use of Order Set



The Post-Op Tethered Cord Order set should be used for all patients who are post procedure. It will help ensure that all pathway elements are ordered correctly.

Order sets also help track pathway usage and pathway metrics.

*NOTE: This order set is not to be used for PICU patients. Patients going to the PICU post operatively should use the PICU – Neurosurgery Order Set instead

Quality Metrics

- Percentage of patients with pathway order set usage
- Percentage of patients with deep wound infections
- Percentage of patients with superficial skin infections (SSI)
- Number of patients with organ space infection within 30 days of principal operative procedure
- Readmission within 30 days
- Return to the OR within 30 days

Pathway Contacts

- Petronella Stotlz, APRN, DNP
  - Department of Pediatric Neurosurgery
- Marcus Bookland, MD
  - Department of Pediatric Neurosurgery
- Jonathan Martin, MD
  - Department of Pediatric Neurosurgery

References

- Bowman RM, Mohan A, Ito J, Seibly JM, McLone DG. Tethered cord release: a long-term study in 114 patients. *J Neurosurg Pediatr*. 2009 Mar;3(3):181-187.
- Yamada S, Won DJ, Pezeshkpour G, et al. Pathophysiology of tethered cord syndrome and similar complex disorders. *Neurosurg Focus*. 2007;23(2):E6.
- Bratzler DW, Dellinger EP, Olsen KM, et al. Clinical practice guideline for antimicrobial prophylaxis in surgery. *Sur Infect (Larchmt).* 2013 Feb;14(1):73-156.

Thank You!

About Connecticut Children's Pathways Program

Clinical pathways guide the management of patients to optimize consistent use of evidence-based practice. Clinical pathways have been shown to improve guideline adherence and quality outcomes, while decreasing length of stay and cost. Here at Connecticut Children's, our Clinical Pathways Program aims to deliver evidence-based, high value care to the greatest number of children in a diversity of patient settings. These pathways serve as a guide for providers and do not replace clinical judgment.