1.0 Introduction

Patients with hydrocephalus requiring cerebrospinal fluid diversion via a shunt were identified as a population that Neurosurgery cared for that required streamlining of care due to high volumes and complications such as infection which were relatively high compared to other procedures. This clinical practice guideline has been updated to reflect emerging changes in evidence (initial document developed 1997/98).

Target Population

- Inclusion: (May include cysto-peritoneal shunting and subdural peritoneal shunts)
- Infant/child with hydrocephalus requiring 1st shunt intervention.
- Child with existing shunt for hydrocephalus management.
- Newborn to 18 years of age with signs/symptoms of shunt malfunction (i.e. nausea/vomiting, headache, lethargy, irritability &/or altered level of consciousness (LOC))

Target Users

- All health care providers who may encounter a patient with a shunt or requiring a shunt.

2.0 Definitions

- **Shunt**: Referring only to a ventricular-peritoneal shunt
- **Shunt Revision**: Surgical replacement or change to an existing shunt

3.0 Clinical Practice Recommendations

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### Ventricular Peritoneal Shunt Insertion or Revision

#### Expected Date of Discharge: Post-op Day (POD) #2

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#### Key Points

- **Pre-Admission**
  - History & physical assessment (including fontanelle assessment and head circumference if less than 10 months)
  - CT scan or MRI (new diagnosis should have a 4-D MRI, otherwise just a FAST MRI to assess ventricular size or head US if infant and clinically appropriate)
  - Shunt series if CT/MRI or US is equivocal, abnormal or shunt components out of place. (Could be targeted/aspirated shunt series looking at specific area if recent revision)
  - Abdominal ultrasound (recent shunt insertion, abdominal examination)
  - Pregnancy screening as per policy: [Emphasis on]
  - Precautions
  - Routine lab including CBC, Electrolytes, PT/INR and TSH.

#### Intra-Operative

- Neurological Vital Signs Q 1-4h: assess if patient requires close observation and notify if unable to
- R & F 10 months of age. Check and review fontanelle Q 2-4h and head circumference daily
- Monitor for signs & symptoms of increased ICP
- Neuroradiologist to review intracranial results (consult appropriate services if any abnormalities)
- Post-op bathing as per policy: [emphasis on]

#### Post-OP

- **Vital signs and Neurological Vital Signs Q 2-4h**
- Vital Signs Q 2-4h
- Bovine Q shift
- 9-18 months of age: check and review fontanelle Q 2-4h and head circumference daily
- Monitor for signs & symptoms of increased ICP
  - Neurological Vital Signs Q 2-4h
  - Vital Signs Q 2-4h
  - Bovine Q shift

#### Discharge

- Vital signs and Neurological Vital Signs Q 2-4h
- Fluid restriction recorded
- Signs and symptoms of increased ICP
- Child and family verbalization of pain & nausea controlled well through non-pharmacologic means
- Ensure patient has had a bowel movement
- Vision assessed

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### Pre-operative teaching:
- NPO instructions
- Clear liquids
- IV insertion if applicable
- Prone bath
- Transport to OR
- Answer questions or offer resource for short related topics
- Recovery room
- Post-op medications/Pain management
- Assess child & family's understanding
- Child/family verbalize awareness/understanding of plan of care

### Post-operative teaching:
- Wash to remain d/c for 48 hours
- Pain relieved by day 3
- FHR is notified if any leakage noted from access site
- Expected bruising
- Washless drainage to family
- Signs and symptoms of increased ICP
- Review/Provide short readmission

### Discharge medication reconciliation
- Medication reconciliation completed (medication reconciliation policy)
- Analyzed and entered
- All medications
- Opioids
- Oral morphine
- Antihypertensives
- All doses post-operative day 2

### Discharge summary
- Review with family wound care
- Review/Provide short readmission
- Medications
- Class numbers, office number, contact number
- Follow-up appointment (x imaging required)
- Child/family verbalize awareness and understanding of plan of care post-discharge

### If child has a programmable valve
- MPRF to document setting and ensure family is aware of programmable valve, current setting and MPRF instructions
4.0 Guideline Group and Reviewers

Guideline Group Membership:
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5. Dr. D.D. Cochrane: Staff Neurosurgeon

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9. Sabrina Boodhan, Pharmacist

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2. Dr. Mandee Tamber MD, PhD, FRCSC: Assistant Professor, Pediatric Neurosurgery University of Pittsburgh School of Medicine Children’s Hospital of Pittsburgh

5.0 References


Attachments:

Shunt protocol.pdf

ventricular shunt_CPG_September 2021.pdf