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
# Ventricular Peritoneal Shunt Insertion or Revision

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

### PRE-ADMISSION
- History & physical assessment (including fontanels assessment and head circumference if less than 10 months)
- CT scan or MRI (now diagnostic should have a 4D MRI, otherwise they could just be FAST MRI) to assess ventricular size or Head U/S (if infant and clinically appropriate)
- Shunt series if CT/MRI or U/S is equivocal, abnormal or shunt components out of place (Could be targeted echo/shunt series looking at specific area if recent revisions)
- Abdominal ultrasound (recent shunt insertion, abdominal examination)
- Pregnancy screening as per policy: [Emphysema](#)
- Screening tests:
  - Routine labs including CBC, ECG, cr/crea, PT/INR and type/sens
- If suspected sepsis medical team to consider initiating the empiric antibiotic
- Shunt infection should be suspected in patients who have had a shunt surgery within the past 6 months
- If suspected shunt infection: medical team to consider debridement, shunt revision
- Call neurosurgery immediately if the symptoms are noted or rapidly progressive
- Peri-operative/postop policy: p.r.n. bathing policy
- Awake procedures: postop/bathing policy
- Assess family understanding of plan of care

### ADMISSION/PR-OP
- Neurological Vital Signs Q 1-4h if the patient requires close/constant observation and notify unit if required
- If > 10 months of age, check and record fontanels Q 3-4h and head circumference daily
- Monitor for signs & symptoms of increased ICP
- Neurosurgeon to review stroke results (consult appropriate services if any abnormalities)
- Peri-operative/postop bathing policy

### INTRA-OPERATIVE
- See [Shunt Infusion Protocol Checklist](#) to be completed in OR (swinging room staff only)
- OR intraop
  - Limited by signs on door
  - Number of people scrubbed/bearing not limited
  - Patient position feet closer to door than head
  - Wash shunt with pre-op shunt

### POST-OP
- Vital signs & Neurological Vital Signs Q 3-4h
  - Vital signs Q 3-4h
  - Head circumference recorded
- Signs and symptoms of increased ICP
- Child and family verbalization pain & nausea well controlled prior to discharge
- Ensure patient has food a bowel movement
- Inoculation is assessed

### DISCHARGE
- Vital signs & Neurological Vital Signs prior discharge
- Monitor for signs & symptoms of increased ICP
- Time-panning or head shunt insertion depending on child's age
- Removing post-op shunt series is not required – will only be ordered when specifically indicated

## Consults
- Neurosurgery consult if indicated
- Neurosurgeon to complete pre-operative orders in electronic system
- IV therapy for hydration and antibiotics if indicated
- Neurosurgeon to obtain consent from parents/guardian
- Consults: Pharm (including side effects of medications, for example Endetan, fentanyl, Zoladex, etc)
- Social Work, Child Life consult as indicated

## Nursing
- Use protocols and policies
- Use intraoperative and perioperative policies
- Use team to follow-up recommendations for change

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### Ventricular Peritoneal Shunt Insertion or Revision

**Activity**
- Activity As Tolerated

**Nutrition & Diet**
- NPO or Diet As Tolerated [American Academy of Pediatrics (AAP) guidelines]
- Activity As Tolerated

**Activity**
- Complete falls assessment, document in care plan, and on patient record [falls and CPTG guidelines]
- Activity As Tolerated

**Nutrition & Diet**
- NPO or Diet As Tolerated [American Academy of Pediatrics (AAP) guidelines]

**Activity**
- Elevate head of bed as per medical orders
- Activity as tolerated or bedrest as per medical team
- Encourage deep breathing and coughing exercises

**Nutrition & Diet**
- Diet As Tolerated

**Dressing & Wound Care**
- Neurorsurgical to note in chart type of closure (Vacuum/Drain)
- Instruct to remain on bedrest for 24-48 hours post-op
- Notify MD if dressing well or oozing from incision noted
- Change allow at daily post-op

**Fixed Management**
- Discontinue IV when antibiotics completed, tolerating full fluids and no nausea and no further investigations pending (CT, MRI)

**Activity**
- Activity As Tolerated

**Nutrition & Diet**
- Diet As Tolerated

**Dressing & Wound Care**
- Neurorsurgical to note in chart type of closure (Vacuum/Drain)
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### Ventricular Peritoneal Shunt Insertion or Revision

#### Medicals
- Complete medication reconciliation. Ensure to evaluate if child is on any antihypertensive or other medications (prescription or over-the-counter) that may affect surgery or GA. Consultation: Anesthesia.
- Vasoactive medications may be required preoperatively.
- Rifampicin: 10 mg/kg IV (max 25 mg) given 1 dose 6 hrs post intra operative time.
- Antibiotics: Undertaken or dimethadione.
- Discharge medication reconciliation completed: Medication reconciliation policy.
- Pain assessment: Analgesics ordered based on pain assessment.
- Nitrous oxide.

#### Pre-operative teaching:
- NPO instructions
- CRU time
- 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/parent verbal awareness/understanding of plan of care

#### Post-operative teaching:
- Washout to remain dry for 48 hours
- Pain management
- II insertion if required (max 25 mg)
- Expected recovery
- Washout to remaining to family
- Signs and symptoms of increased ICP
- Review/provide short mention of health

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5.0 References


Attachments:

Shunt protocol.pdf
ventricular shunt_CPG_September 2021.pdf