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

©The Hospital for Sick Children ("SickKids"). All Rights Reserved. This document was developed solely for use at SickKids. SickKids accepts no responsibility for use of this material by any person or organization not associated with SickKids. A printed copy of this document may not reflect the current, electronic version on the SickKids Intranet. Use of this document in any setting must be subject to the professional judgment of the user. No part of the document should be used for publication without prior written consent of SickKids.

Ventricular Peritoneal Shunt Insertion or Revision
### Ventricular Peritoneal Shunt Insertion or Revision

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

<table>
<thead>
<tr>
<th><strong>PRE-ADMISSION</strong></th>
<th><strong>ADMISSION/PRE-OP</strong></th>
<th><strong>INTRA-OPERATIVE</strong></th>
<th><strong>POST-OP</strong></th>
<th><strong>DISCHARGE</strong></th>
</tr>
</thead>
</table>

**Consults**
- Neurosurgery consult if indicated
- Neurosurgeon to explain procedure to patient
- Social worker consultation

**Vital Signs & Neurological Vital Signs**
- Monitor for signs & symptoms of increased ICP
- Monitor for signs & symptoms of decreased ICP

**Imaging**
- CT scan: Full MR or head scan depending on patient's age
- CT scan post-op shunt not required

**CT scan:**
- Full MR or head scan depending on patient’s age

**Discharge**
- Discharge home with appropriate follow-up

---

©The Hospital for Sick Children (“SickKids”). All Rights Reserved. This document was developed solely for use at SickKids. SickKids accepts no responsibility for use of this material by any person or organization not associated with SickKids. A printed copy of this document may not reflect the current, electronic version on the SickKids Intranet. Use of this document in any setting must be subject to the professional judgment of the user. No part of the document should be used for publication without prior written consent of SickKids.
### Activity
- Activity As Tolerated

### Nutrition & Diet
- NPO or Diet As Tolerated (American RCP guidelines)

### Activity
- Complete falls assessment document in care plan and in patient record (falls and CSE model)
- Activity As Tolerated

### Nutrition & Diet
- NPO or Diet As Tolerated (American RCP 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
- Patient to be eating moderate amounts with no限制 and maintaining hydration prior to discharge

### Dressing & Wound Care
- Neurosurgeon to relieve in sheet of closure (spigot/washout)
- Incision to remain covered for 24-48 hours post-op
- Notify MD if dressing is wet or oozing from incision noted
- Change all upper and per

### 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
- Neurosurgeon to relieve in sheet of closure (spigot/washout)
- Incision to remain covered for 24-48 hours post-op
- Notify MD if dressing is wet or oozing from incision noted
- Change all upper and per

### 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
- Neurosurgeon to relieve in sheet of closure (spigot/washout)
- Incision to remain covered for 24-48 hours post-op
- Notify MD if dressing is wet or oozing from incision noted
- Change all upper and per

### 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
- Neurosurgeon to relieve in sheet of closure (spigot/washout)
- Incision to remain covered for 24-48 hours post-op
- Notify MD if dressing is wet or oozing from incision noted
- Change all upper and per

### 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
- Neurosurgeon to relieve in sheet of closure (spigot/washout)
- Incision to remain covered for 24-48 hours post-op
- Notify MD if dressing is wet or oozing from incision noted
- Change all upper and per

### 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
- Neurosurgeon to relieve in sheet of closure (spigot/washout)
- Incision to remain covered for 24-48 hours post-op
- Notify MD if dressing is wet or oozing from incision noted
- Change all upper and per

### Fixed Management
- Discontinue IV when antibiotics completed, tolerating full fluids and no nausea and no further investigations pending (CT, MRI)
### Ventricular Peritoneal Shunt Insertion or Revision

#### Medications
- Complete medication reconciliation. Errors to evaluate if child is on any anticoagulants or other medications (prescription or over-the-counter) that may affect surgery.
- Analgesic ordered.
- Based on pain assessment give:
  - Morphine
  - Anti-emetics as required (dimenhydrinate or ondansetron)
- See Anesthesia Guidelines

#### Pre-operative Teaching:
- NPO instructions
- OR insertion if applicable
- Prone bath
- Transport to OR
- Answer questions or offer resource for related questions
- Recovery room
- Post-operative pain management
- Assess child and family’s understanding
- Child-family verbal awareness/understanding of plan of care

#### Post-operative Teaching:
- Wash to remain dry for 48 hours
- Firm bandage daily
- Monitor bowel function
- Expect bleeding
- Wash out bleeding if family
- Sits and sits at family
- Increased ICP
- Monitor ICP
- Monitor respiratory
- Monitor ICP
- If child has a programmable valve:
  - MCPAP to document setting and rate
  - Ensure family and nurses are aware of programmable valve, current settings, and how to perform teaching
  - Provide family with a Patient Data sheet

#### Discharge Considerations
- Review patient with family
- Review/Provide short
- Review and request
- Medications
- Class numbers, office number, contact number
- Follow-up appointment (if imaging
- Child-family verbal awareness and understanding of plan of care post-discharge

#### Complications
- Increased ICP
- Seizures
- Hypotension
- Hypertension
- Infection
4.0 Guideline Group and Reviewers

Guideline Group Membership:
1. Patricia Rowe, RN (EC), MN, NP Paeds Nurse Practitioner Neurosurgery
2. Maria Lamberti-Pasculli, RN, Neurosurgery Research Nurse
3. Sara Breiltart, RN, (EC), MN, NP Paeds Nurse Practitioner Neurosurgery
4. Dr. Abhaya Kulkarni: Staff Neurosurgeon
5. Dr. D.D. Cochrane: Staff Neurosurgeon

Internal Reviewers:
1. Dr. James Drake, Chief of Neurosurgery
2. Dr. James Rutka: Staff Neurosurgeon
3. Dr. Peter Dirks: Staff Neurosurgeon
4. Dr. Michael Taylor: Staff Neurosurgeon
5. Arbelle Manicat-Emo, RN (EC), MN, NP Paeds Nurse Practitioner Neurosurgery
6. Herta Yu, RN (EC), MN, NP Paeds Nurse Practitioner Neurosurgery
7. Dr. Dennis Scolnik Staff Physician, Emergency
8. Dr. Jamie Hutchison Staff Physician, CCU
9. Sabrina Boodhan, Pharmacist

External Reviewers:
1. Dr Jan Riva-Cambrin MD FRCS: Assistant Professor of Neurosurgery, University of Utah
2. Dr. Mandeep Tamber MD, PhD, FRCS: 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