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
### Ventricular Peritoneal Shunt Insertion or Revision

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

#### Pre-ADMISSION
- History & physical assessment (including fontanella assessment and head circumference if less than 10 months)
- CT scan or MRI (new diagnosis should have a full MRI, otherwise could just be FAST MRI) to assess ventricular size or Head US (if infant and clinically appropriate)
- Shunt status if CT/MRI or US is residual, abnormal or shunt components out of place (could be targeted by small shunt series looking at specific area if recent revision)
- Abdominal ultrasound (recent shunt insertion, abdominal examination)
- Pregnancy screening as per policy: *Pregnancy Screening Policy*
- Routine labs including CBC, Electrolytes, PTT/INR and Type/Sens
- If suspected sepsis medical team to consider initiating the sepsis protocol
- Shunt infection should be suspected in patients who have had a shunt surgery within the past 6 months
- If suspected infection: medical team to consider decubitus, IVH
- Call neurosurgery immediately if the symptoms are noted or rapidly progressive
- Pre-op bathing as per policy *pre-op bathing policy*
- Assess pre-operative coping and hospitalization
- Assess family understanding of plan of care

#### Consults
- Neurosurgery consult if indicated
- Neurosurgeon to complete pre-operative orders in electronic system
- IV therapy for hydration and antibiotic if indicated
- Neurosurgeon to obtain consent from family
- Social work, child life consult as indicated

#### Admission/Pre-Op
- Neurological Vital Signs Q 1-4h: assess if the patient requires bedside/critical care observation and notify if unit is required
- If 6-10 months of age, check and record Fontanel Q 3-4h and head circumference daily
- Monitor for signs & symptoms of increased ICP
- Neurosurgeon to review stroke treatment results (consult appropriate services if any abnormalities)
- Pre-op bathing as per policy *pre-op bathing policy*

#### Intra-Operative
- See Shunt Insertion Protocol Checklist to be completed in OF (swimming room staff only)
- OR intrao:
  - Limited by signs on door
  - Number of people scrubbed/hearing not limited
  - Patient position feet closer to door than head

#### Post-Op
- See Admission/Pre-Op
- Vital signs & Neurological Vital Signs Q 2-4h
- Vital Signs Q 3-4h
- Monitor for signs & symptoms of increased ICP
- IV fluids
- Monitor for signs & symptoms of increased ICP
- Sydrys

#### Discharge
- Vital signs & Neurological Vital Signs Q 2-4h
- Head circumference recorded
- Signs and symptoms of increased ICP
- Child and family verbalize pain & assess well controlled prior to discharge
- Ensure patient has had bowel movement
- Indomethacin is assessed

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### Ventricular Peritoneal Shunt Insertion or Revision

<table>
<thead>
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<th>Activity</th>
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<tr>
<td>Activity As Tolerated</td>
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<tr>
<td>Nutrition &amp; Diet</td>
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<tr>
<td>NPO or Diet As Tolerated Anesthesia NPO guidelines</td>
<td>NPO or Diet As Tolerated Anesthesia NPO guidelines</td>
</tr>
</tbody>
</table>

#### Pain Management

- Age appropriate pain assessment using pain assessment tool
- Infuse Canada/Canadian bundle
- Pain assessment tools (please select appropriate):
  - PAPP
  - FLACC
  - Wong
  - Numeric
  - Faces
  - NCCPC-P
  - NCCPC-PV

#### Nutrition & Diet

- Activity As Tolerated

#### Dressing & Wound Care

- Nonadherent to reline in sheet type of closure (Biornder/Turkot)
- Incision to remain covered for 24-48 hours post-op
- Notify MD if dressing well or oozing from incision noted
- Change allowable daily and post

#### 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

- Patient to be on eating moderate amounts with nosnacks and maintaining hydration prior to discharge

- Discharge and Wound Care

- Remove original dressing prior to discharge, occur with new Pressure if required (less than 48 hours)
- Review wound care instructions
- MDNP to view incision prior to discharge
- If drain is place, instruct family that will drain over time (~4 weeks)
- If allowed: Instructions for family MD to remove 10th day post-op
- If tube: give staple remover to family with instructions for family MD to remove 10th day post-op
- Information: give staple remover to family with instructions for family MD to remove 10th day post-op

- Neurosurgery to indicate if further
### Ventricular Peritoneal Shunt Insertion or Revision

<table>
<thead>
<tr>
<th>Pre-operative Teaching</th>
<th>Post-operative Teaching</th>
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<tbody>
<tr>
<td>• NPO instructions</td>
<td>• Wash to remain dry for 48 hours</td>
</tr>
<tr>
<td>• Head / IV insertion if applicable</td>
<td>• Pain instruction on day 3</td>
</tr>
<tr>
<td>• Prone bath</td>
<td>• MRI scan notified if any leakage noticed on scans</td>
</tr>
<tr>
<td>• Transport to OR</td>
<td>• Expected bleeding</td>
</tr>
<tr>
<td>• Answer questions or offer resource for short related questions</td>
<td>• Wash out bleeding to family</td>
</tr>
<tr>
<td>• Recovery room</td>
<td>• Signs and symptoms of increased ICP</td>
</tr>
<tr>
<td>• Post-op medications</td>
<td>• Review short neurosurgical surgery information</td>
</tr>
<tr>
<td>• Pain management</td>
<td>• Maintain awareness and understanding of plan of care post-discharge</td>
</tr>
<tr>
<td>• Assess child &amp; family's understanding</td>
<td>• If child has a programmable valve: MCRP is default setting and ensure family are aware of programmable valve, current setting and MRI restrictions. RV to reinforce teaching. Provide family with a Patient Data card</td>
</tr>
</tbody>
</table>

**Discharge medication reconciliation:**
- Medication reconciliation completed
- Medication reconciliation policy
- Medication errors noted
- Prophylactic:
  - Analgesics
  - Antibiotics
  - Anticonvulsants

**Anesthesia:**
- General
- Local
- Spinal

**Medication Reconciliation:**
- Enteral
- Intravenous
- Oral

**Endocardial Ablation:**
- None

**Ventricular Peritoneal Shunt Insertion or Revision**
- Review with family wound care
- Review/Provide short neurosurgical surgery information
- Review/Provide healthcare Abkhazian information
- Meds
- Class number
- Room number
- Contact number
- Follow-up appointment (if imaging required)
- Child and family understanding and awareness of plan of care post-discharge
- If child has a programmable valve: MCRP is default setting and ensure family are aware of programmable valve, current setting and MRI restrictions. RV to reinforce teaching. Provide family with a Patient Data card

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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 Breitbart, 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. Arabelle 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