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

<table>
<thead>
<tr>
<th>PRE-ADMISSION</th>
<th>ADMISSION/PRE-OP</th>
<th>INTRA-OPERATIVE</th>
<th>POST-OP</th>
<th>DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consults</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History &amp; physical assessment (includingfontanelle assessment and head circumferences if less than 10 months)</td>
<td>Neurological Vital Signs Q 1-4h. Assess if the patient requires close/critical observation and notify if required</td>
<td>Neurosurgeon to review bloodwork results consult appropriate services if any abnormalities</td>
<td>Neurological Vital Signs Q 2-4h. Vital Signs Q 1-4 h</td>
<td>Vital signs &amp; Neurological Vital Signs per discharge</td>
</tr>
<tr>
<td>CT scan or MR (new diagnosis should have a full MR, otherwise they should do a FAST MR) to assess ventricular size or Head Ultrasound (if infant and clinically appropriate)</td>
<td>Head Ultrasound (if infant and clinically appropriate)</td>
<td>Neurosurgeon to review bloodwork results consult appropriate services if any abnormalities</td>
<td>Head ultrasound recorded</td>
<td>Head ultrasound recorded</td>
</tr>
<tr>
<td>Shunt fluid 3T/1.5T or MRI is optional, abnormal or shunt components not out of place. (Could be targeted/diagnostic shunt series looking at specific area if recent revisions)</td>
<td>Monitor for signs &amp; symptoms of increased ICP</td>
<td>Intracranial pressure</td>
<td>Signs and symptoms of increased ICP</td>
<td>Signs and symptoms of increased ICP</td>
</tr>
<tr>
<td>Abdominal ultrasound (recent shunt insertion, abdominal distension)</td>
<td>Anticoagulation as per policy pre-op bathing policy</td>
<td>Neuroradiology</td>
<td>Child and family education pain &amp; nausea well controlled prior to discharge</td>
<td>Child and family education pain &amp; nausea well controlled prior to discharge</td>
</tr>
<tr>
<td>Pregnancy screening as per policy</td>
<td>Post op bathing as per policy pre-op bathing policy</td>
<td>Sedation</td>
<td>Ensure patient has had a bowel movement</td>
<td>Ensure patient has had a bowel movement</td>
</tr>
<tr>
<td>Routine labs including CBC, Electrolytes, PT/INR and TaperedPinn</td>
<td>Pre-op bathing as per policy post-op bathing policy</td>
<td>Sepsis</td>
<td>Indication</td>
<td>Indication</td>
</tr>
<tr>
<td>If suspected sepsis medical team to consider initiating the sepsis protocol</td>
<td>Pre-op bathing as per policy post-op bathing policy</td>
<td>Line insertion</td>
<td>GI bleed</td>
<td>GI bleed</td>
</tr>
<tr>
<td>If suspected surgery immediately if the symptoms are rapidly progressive</td>
<td>Pre-op bathing as per policy post-op bathing policy</td>
<td>CT scan</td>
<td>Carboplatin</td>
<td>Carboplatin</td>
</tr>
<tr>
<td>Pre-op baking as per policy post-op bathing policy</td>
<td>Pre-op bathing as per policy post-op bathing policy</td>
<td>CT scan</td>
<td>Carboplatin</td>
<td>Carboplatin</td>
</tr>
<tr>
<td>Assess family understanding of plan of care</td>
<td>Pre-op bathing as per policy post-op bathing policy</td>
<td>CT scan</td>
<td>Carboplatin</td>
<td>Carboplatin</td>
</tr>
</tbody>
</table>

**Consults**

- Neurosurgery referral and investigations completed
- Use interprofessional and family team approach
- Update medical plan based on outcomes
- Place on bath list for discharge
- Arrange follow-up recommendations for change
### Pre-operative teaching:
- NPO instructions
- OR time
- IV insertion if applicable
- shower bath
- Transport to OR
- Answer questions or offer resource for short related questions
- Recovery room
- Post-op medications/Pain management
- Assist child & family’s understanding
- Child/family verbalize awareness/understanding of plan of care

### Post-operative teaching:
- Wish to remain dry for 48 hours
- Pain management
- FRB to be notified if any leakage noted from drain site
- Expected bloating
- Wish to be taught to family
- Signs and symptoms of increased ICP
- Review/Provide short renal/infusion
- Review/Provide instructions
- Review/Provide ICD
- Follow-up appointment (as imaging required)
- Child/family versatile awareness and understanding of plan of care post-discharge
- If child has a programmable valve
- MOP to document setting and ensure family is aware of programmable valve, current setting and future teaching
- Provide family with a Patient Data sheet

**Ventricular Peritoneal Shunt Insertion or Revision**
4.0 Guideline Group and Reviewers

Guideline Group Membership:
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Children’s Hospital of Pittsburgh

5.0 References


Attachments:

Shunt protocol.pdf
ventricular shunt_CPG_September 2021.pdf