

Children's Mercy Kansas City

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Care Process Models

Quality Improvement and Clinical Safety

11-2018

Neurosurgical Shunts, Trouble Shooting for Malfunction

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These guidelines do not establish a standard of care to be followed in every case. It is recognized that each case is different and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare guidelines for each. Accordingly, these guidelines should guide care with the understanding that departures from them may be required at times.

- Shunt types:**
- Shunts used to treat hydrocephalus (**malfunction can be life threatening**):
 - Ventriculo-peritoneal (VP)
 - Ventriculo-atrial (VA)
 - Ventriculo-pleural (VPI)
 - Neonatal devices to treat intraventricular hemorrhage (**patient may need evaluation if less than 2yo for the development of hydrocephalus**):
 - Ventriculo-subgaleal (VSG)
 - Ventricular reservoir / access device (VAD)
 - Cranial shunts not used to treat hydrocephalus (**malfunction is not life threatening and can be treated on an outpatient basis**):
 - Subdural-peritoneal (SDP)
 - Cysto-peritoneal (CP)
 - Spinal shunts (**malfunction is not life threatening and can be treated on an outpatient basis**):
 - Lumbo-peritoneal (LP)
 - Syringo-pleural (SP)
 - Syringo-subarachnoid (SSA)

Troubleshooting Neurosurgical Shunts for Malfunction

- S/S of increased ICP:**
- Headache
 - Vomiting
 - Altered mental status
 - Bradycardia with hypertension

Does patient have any S/S suggestive for increased ICP?

No → Based on HPI and exam, consider other diagnoses and W/U

Yes → Identification of shunt type

Does the patient have a ventricular shunt?

No → If patient has a nonventricular shunt have family contact Neurosurgery Clinic for follow up

Yes → Does the patient have altered mental status or bradycardia with hypertension?

Yes → Initiate emergent care procedures including:

- STAT Neurosurgical Consult
- CT and Shunt Series per Neurosurgery recommendation

No → Can, and does, the patient report a headache?

No → If patient is nonverbal, does patient exhibit other signs of raised ICP?

Yes → Obtain:

1. CT or rMRI
2. Shunt series

Yes → Are the patient's ventricles slit, dysmorphic, or enlarged?

Yes → Call Neurosurgery

No → Does the shunt series identify disruption of the shunt hardware?

Yes → Call Neurosurgery

No → Based on HPI and exam, consider other diagnoses and W/U

Timing of previous imaging in relationship to prior malfunction is **critical** to identify. If most recent prior imaging was obtained immediately prior to a malfunction, new imaging may not show "enlargement" of ventricles comparatively because the current imaging also represents a shunt malfunction. Consult Neurosurgery.

Slit or **dysmorphic** ventricles may not change in size when exposed to increased intra-cranial pressure. If the CT or MRI radiology report states slit or dysmorphic ventricles and shunt malfunction is suspected based on the patients signs and symptoms, consult Neurosurgery.

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