

CSF Shunts

Types of CSF Shunts:

- Ventriculoperitoneal (VP) shunts (catheter ends in peritoneal cavity)
- Ventriculopleural shunts (catheter ends in the pleural space)
- Ventriculoatrial (VA) shunts (catheter ends in right heart atrium)
 - Placed if VP or ventriculopleural shunt is not feasible
- Ventriculosubgaleal shunts (catheter ends in subgaleal pocket)
 - Placed temporarily in preterm infants who are too small for other shunts

Structure/Function of CSF Shunts:

- Proximal catheter - typically placed in a lateral ventricle; occasionally placed in 4th ventricle
 - Can be multiple proximal catheters
- One-way valve - designed to drain when pressure exceeds set value (mm H₂O)
 - Higher shunt setting = less fluid drained
 - Lower shunt setting = more fluid drained
 - Some shunts, known as programmable shunts, may have valves that are adjustable
 - Some programmable shunts can be affected by magnets - important to know before performing an MRI because programmable shunt will need to be reprogrammed after MRI

- Reservoir – holds small amount of CSF, can be tapped percutaneously for CSF sample
- Distal catheter - ends in peritoneal cavity, right heart atrium, pleural space, or subgaleal pocket
- Anti-siphon device – decreases over-drainage when patient is upright

Causes of Shunt Malfunctions:

- Kinked or fractured catheter
- Clogged catheter or valve
- Migration of the intraventricular catheter
- Excessive drainage

Workup of Potential Shunt Malfunction/Infection:

- Bloodwork as indicated
- Neurosurgery can tap CSF shunt reservoir to obtain CSF studies
- Xray shunt series (only useful if malfunction highly suspected/confirmed; otherwise unnecessary radiation exposure)
 - Provides imaging of the shunt/tubing pathway
 - Images – skull, cervical spine, chest, abdomen
- Fast MRI (MRI shunt series)
 - Shows size of ventricles – likely enlarged in case of shunt malfunction
 - Shows location of proximal catheter
- Abdominal imaging (ultrasound or CT)
 - Indicated to evaluate for potential etiology of distal shunt obstruction

