

Shunt

Background

A shunt is an implanted catheter used to drain excess cerebral spinal fluid (CSF) circulating around the brain. An obstruction in the normal outflow or a decreased absorption of the CSF can increase intracranial pressure causing irritability, chronic headaches, learning difficulties, and visual changes. Surgical placement of a ventriculoperitoneal (VP) shunt is most often used to treat a condition known as hydrocephalus.

During surgery, a shunt consisting of a ventricular catheter and distal catheter is connected by a valve. The valve opens when fluid pressure gets too high in the brain, diverting CSF from the brain via the distal catheter and into the peritoneum. This excess fluid is then absorbed into the bloodstream, filtered through the kidneys, and eventually excreted through urine.

As a surgically implanted device, VP shunts require monitoring for infection and malfunction. Swelling along the shunt tract, reports of headache, nausea, vomiting, irritability, changes in vision or coordination, and decrease in sensory function should be reported to the school nurse. A VP shunt is most at risk for an infection secondary to an abdominal infection, but complications are often less severe. Fever, chills, neck stiffness, tenderness, or pain should be assessed.

Valves can have fixed or programmable settings, but both operate to maintain even pressure between the proximal and distal catheter. It is important to note that a programmable valve can be adjusted by a strong magnetic field. Some valves may be susceptible to adjustment by strong magnets (e.g., toys, electronic devices) while others are only able to be altered by a manufacturer specific tool.

Shunt complications can occur on either the ventricular or distal catheter. Obstruction, infection, and equipment malfunction (e.g., kinked tubing) are possible. Obstruction by blood cells or tissue can cause disruption of the flow of CSF. A shunt can also drain too quickly causing damage to the blood vessels and ventricles resulting in headaches or further complications. Shunt tapping can be performed by the healthcare provider for diagnostic and therapeutic evaluation.



Top Takeaways for School

A shunt is a surgically placed device used to divert the flow of CSF. A ventriculoperitoneal (VP) shunt is most often used to treat hydrocephalus.

A VP shunt requires monitoring for infection and malfunction. The student's emergency plan should include signs and symptoms of both.

Initial signs and symptoms of complications may be more subtle and first reported by the classroom teacher (e.g., irritability, changes in personality, disorganization, declining school performance).

Manufacturers guidelines should be followed for safety restrictions or precautions specific to the student's VP shunt. This may include magnet safety.

Considerations for the Individualized Healthcare Plan (IHP)

- Nursing diagnoses: Impaired thought process, risk for injury and risk for infection
- Assessment of implanted medical device (consider location, date of surgical placement, and device-specific information)
- Temperature regulation considerations in school setting and transportation
- Activity, positioning, transferring (consider precautions and/or restrictions)
- Use of specialized equipment, adaptive equipment and orthotics
- Consider emergency action plans (EAPs) and emergency evacuation plans (EEPs) related to special health care needs, including staff education/training

Discussion Starters for the Educational Team

1. Would the student benefit from evaluations or assessments in any of the following areas: physical therapy, occupational therapy, speech and language therapy, assistive technology, adapted physical education, functional behavior, psychology, hearing and vision?
2. Would the student benefit from additional academic support and/or modified education (e.g., copies of notes, extra time, reduced workload, simplified instructions, alternative formats for presentation of material, 504/IEP)?
3. Does the student require activity precautions to prevent injury?
4. Does the classroom environment support the student's needs and/or equipment (e.g., desk/seating options, maneuverability space, electrical outlets, flash pass for bathroom or nurse)?
5. Will staff receive education/training to implement the student-specific emergency plan?

Resources

Kennedy Krieger Institute: Center for Spina Bifida and Related Conditions
[kennedykrieger.org/patient-care/centers-and-programs/center-for-spina-bifida-and-related-conditions](https://www.kennedykrieger.org/patient-care/centers-and-programs/center-for-spina-bifida-and-related-conditions)

Hydrocephalus Association
[hydroassoc.org/](https://www.hydroassoc.org/)



For more information, please scan the QR code or visit: [KennedyKrieger.org/SHNIC](https://www.KennedyKrieger.org/SHNIC)

