

Shunt Surgery for Hydrocephalus

What Is Shunt Surgery for Hydrocephalus?

Treatment for **hydrocephalus** with a shunt involves surgically implanting a flexible plastic tube, called a shunt, into the brain or spinal cord to divert excess cerebral spinal fluid (CSF) away from the brain. The shunt is then adjusted and monitored regularly. Shunt placement and management is the most common treatment for hydrocephalus. In some cases, specialists use endoscopic third ventriculostomy.



A ventricular shunt is a flexible plastic tube, about 1/8 inch in diameter, with a valve that controls the flow of cerebral spinal fluid (CSF) draining from the cavities (ventricles) of the brain. The brain shunt gets placed in the lateral ventricle, where it can drain to one of the following areas:

- **Abdomen (ventriculoperitoneal shunt).** When CSF drains into this area that holds the digestive organs, it gets absorbed into the bloodstream. Placement of a ventriculoperitoneal shunt usually involves fewer risks than other types of shunts.
- **Heart (ventriculoatrial shunt).** A ventriculoatrial shunt runs through a vein in the neck into the right atrium of the heart, where CSF flows directly into the bloodstream.
- **Chest (ventriculopleural shunt).** These types of shunts divert CSF into the chest cavity around the lungs.

A fourth type of shunt—lumboperitoneal shunt—drains fluid from the space around the spinal cord in the lower back (lumbar) into the abdomen.

Shunt systems typically include a programmable valve, which can control the rate of drainage without additional surgery.

Who Benefits from Shunt Surgery?

Shunt surgery helps children who have hydrocephalus live full and successful lives. Kids diagnosed and treated in infancy have heads similar in size to those of their peers. Following surgery, your child can participate in most day-

to-day activities, but should still be careful in rough contact sports.

Preparing for Surgery

You can help make sure your child has the best possible surgery outcome by understanding what to expect before, during and after brain shunt surgery at Gillette Children's Specialty Healthcare.

Here are a few resources to help you feel more prepared:

- Review tips to [prepare for surgery at Gillette.](#)
- Understand the [amenities available at Gillette.](#)

A Week Before Surgery

A week before the surgery, we will contact you to:

- Gather a health history, including details about medicines (name, dose, frequency), pharmacy and primary care doctor.
- Discuss what to expect on the day of surgery and during the hospital stay.
- Let you know what you'll need when your child leaves the hospital.

Maintain a Healthy Diet and Regular Activity

Overall health can affect how well and how quickly your child recovers from hydrocephalus surgery. In general, kids should maintain regular levels of activity

Before and after the surgery, make sure your older child eats enough food with iron, calcium and vitamins C and D. Fresh colorful fruits and vegetables, dairy food, and other products with added iron and calcium offer great ways to get these nutrients.

Tell Us About Latex Allergies

Gillette is a latex-free facility. However, we still want to know if your child has a latex allergy or has ever had a severe reaction to latex.

Manage Stress

Sometimes fears, behavior or expectations related to upcoming surgery can cause stress for families. Contact your child's primary health care provider or Gillette [Child and Family Services](#) for support.

We can also help with resources that might reduce anxiety for your family. Our [child life specialists](#) can provide emotional support and distractions, such as toys and movies in the waiting area before surgery begins. Child life specialists can also meet with your child's siblings to address their feelings and concerns.

Knowing what to expect can help everyone feel more prepared. We'll take time to clarify short- and long-term expectations for outcomes following shunt surgery.

During Your Hospital Stay

The Day of Surgery

Arrival

The perianesthesia staff welcomes you when you arrive. We weigh your child, and ask them to change into a hospital gown. We also check temperature, pulse and blood pressure. A **child life specialist** helps your child feel more at ease with toys, crafts or movies.

Surgery Preparation

Next, you and your child meet with the surgery team, which includes:

- Pediatric neurosurgeon.
- Nurse anesthetist.
- Anesthesiologist.
- Nurses.

This is a chance for you to raise any questions or concerns. The anesthesiologist discusses how anesthesia and pain medicine are used during surgery. You can talk about your child's experiences with pain and request medicine or other techniques to help them relax.

Surgery

A **pediatric neurosurgeon** implants the shunt's tubing, which runs from the brain along the neck, just behind the ear, and down to the drainage area where the excess CSF gets reabsorbed. The surgery typically lasts less than an hour.

After Surgery

After surgery, all parts of the shunt remain under the skin. Shunts usually aren't visible through the skin, except in infants. Following shunt placement, the pressure inside your child's head (intracranial pressure) returns to normal and the size of their brain's cavities decreases.

In infants, the space between the bones of the skull (called the fontanel, or "soft spot") becomes soft and might appear sunken. The gaps (sutures) will narrow or possibly overlap.

Your child will be in the hospital two to seven days, depending on their clinical progress following surgery.

Follow-up Care

Because hydrocephalus is almost always a lifelong condition, children who have shunts usually need surgeries throughout their lives to adjust, replace or repair their shunts. Our medical specialists work with your family to teach proper shunt maintenance—and how to tell whether or not a shunt is working properly.

Gillette neurosurgeons use programmable shunts to adjust intracranial pressure without additional surgery. We use a magnetic device held over your child's scalp to make the adjustments. Most shunt systems also have an access area (usually called a reservoir) that lets doctors take samples of CSF using thin needles.

Although shunt surgery usually treats hydrocephalus successfully, you should watch for signs of possible shunt malfunction. Contact Gillette immediately if you notice any of these symptoms:

Blockage (obstruction)

The most common type of complication is an obstruction along the shunt tube. A blockage can happen when brain or bowel tissue plugs one end of the shunt. Depending on the seriousness of the obstruction, periodic or ongoing symptoms of hydrocephalus will return.

Shunt obstruction requires immediate medical attention. A neurosurgeon will run tests to find the location and degree of a shunt obstruction. The neurosurgeon might need to remove and replace all or part of the shunt system.

Infection

Because shunts are foreign objects inside the body, they run a small risk of becoming infected. Signs of infection include redness and swelling along the length of the shunt. To treat an infection, a neurosurgeon will remove the shunt, insert a temporary drainage tube and administer antibiotics. Once the infection clears, the neurosurgeon implants a new shunt. Infected shunts occur in less than 5 percent of surgeries. They usually become obvious within one to six months after surgery.

Excess drainage

Shunts can sometimes drain fluid too quickly. This excess drainage usually happens when children are standing. Excess drainage can lead to headaches, vomiting, drowsiness and changes in vision.

Integrated Care

If your child has hydrocephalus, Gillette pediatric neurosurgeons and specialists will work closely with you to develop a customized treatment plan. As a regional leader in pediatric neurology and neurosurgery, we offer access to a full range of services and family support.

Your child might receive care in the following areas related to hydrocephalus shunt treatment:

- **Neurosurgery.**
- Nursing.
- **Gillette Lifetime Specialty Healthcare for Older Teens and Adults.**

Make An Appointment [651-290-8707](tel:651-290-8707) Refer a Patient [651-325-2200](tel:651-325-2200)

This information is for educational purposes only. It is not intended to replace the advice of your health care providers. If you have any questions, talk with your doctor or others on your health care team.

If you are a Gillette patient with urgent questions or concerns, please contact Telehealth Nursing at [651-229-3890](tel:651-229-3890).