

Hydrocephalus

This handout includes information on symptoms, treatment and life after treatment.

My child's shunt is a _____

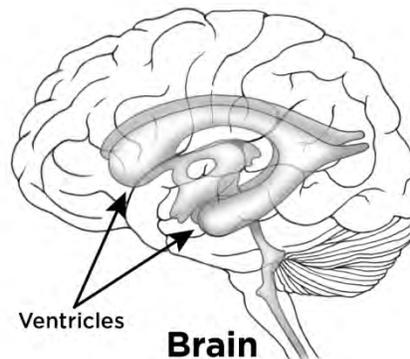
It is:

Non-programmable

Programmable, and set at: _____

What is hydrocephalus?

Hydrocephalus is when too much cerebrospinal fluid (CSF) builds up in the spaces inside your child's brain called ventricles. The ventricles are normally filled with CSF. Cells in the ventricles constantly produce and reabsorb CSF.



CSF moves through the brain and is absorbed into the bloodstream. Hydrocephalus happens when too much CSF is produced, when CSF is not absorbed quickly enough, or both. This causes pressure inside your child's head to build. Hydrocephalus can be present at birth or happen during the course of your child's life for various reasons.

What are the signs and symptoms of hydrocephalus ?

Infants

- Abnormally rapid head growth
- Bulging "soft spots" (fontanelles) on your baby's head
- Vomiting
- Sleepiness
- Eyes that seem to look down all the time
- Poor feeding
- Irritability

Toddlers

- Abnormally rapid head growth
- Vomiting
- Irritability
- Sleepiness
- Loss of developmental milestones (crawling, talking, etc.)

Children and adolescents

- Vomiting
- Headaches
- Vision problems
- Irritability
- Sleepiness
- Loss of coordination or balance
- Decline in academic performance

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To Learn More

- Neurosurgery Clinic
206-987-2544
- Neurodevelopment Clinic
206-987-2210
- Ask your child's healthcare provider
- seattlechildrens.org

Free Interpreter Services

- In the hospital, ask your nurse.
- From outside the hospital, call the toll-free Family Interpreting Line, 1-866-583-1527. Tell the interpreter the name or extension you need.

How is it treated?

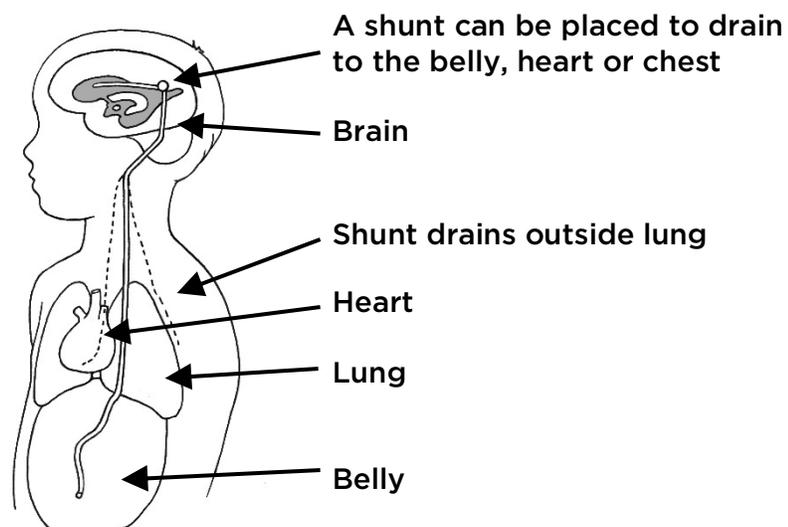
Most children need surgery to help drain the CSF from their head. Surgery most often involves the placement of a tube called a shunt, which drains excess fluid from the brain and brings it to a different place in the body. Shunts can drain into the belly, the heart or the chest. The fluid does not harm these body parts. Moving this fluid to a different space helps to decrease the pressure in the brain.

Another possible treatment for hydrocephalus is a small cut in one of the blocked spaces (endoscopic third ventriculostomy). For this treatment, a shunt is not used. Instead, your child's surgeon makes a small hole into one of your child's ventricles with an endoscope (a thin tube that carries a light and a camera). This allows the CSF to drain on its own through this hole into an area of your child's brain to be reabsorbed. This procedure does not work for all children. Your surgeon will determine if your child is a candidate for this surgery.

Are there different types of shunts?

Yes, there are a variety of shunt types, but they all have 3 parts. These are:

1. A tube that goes into the ventricle where fluid is building up.
2. A valve that controls how much fluid drains out. This controls the pressure in your child's brain and keeps fluid flowing away from it. There is also a small disc called a reservoir that allows your child's surgeon to access the shunt without touching the valve. The reservoir and valve, although small, can be felt and seen under your child's skin. This is more obvious in a baby. The hardware will appear less prominent as your child grows.
3. More tubing is connected below the valve and tracks down to the site chosen for drainage.



The shunt type is named by the part of the body where it drains. The tube in the brain is the ventricular tube.

- **Belly:** In most cases, the end of the shunt is placed in the sac (peritoneum) which holds the organs of the belly. This is called a ventriculoperitoneal (ven-trick-yoo-lo-pair-ih-it-tuh-NEE-ahl) shunt.

- **Heart:** In some cases, the end of the shunt is placed in the upper chambers of the heart (atria). This is called a ventriculoatrial (ven-trick-yoo-lo-ate-RI-al) shunt.
- **Chest:** In other cases, the end of the shunt is placed in the space just outside of the lung, inside the chest wall (pleural space). This type of shunt is called a ventriculopleural (ven-trick-yoo-lo-PLUR-uhl) shunt.

Certain shunt systems have adjustable valves which allow your providers to choose a pressure based on the needs of your child.

These valves can be adjusted from outside your child's body by a small magnet. If this is the valve chosen, we recommend that your child be cautious around electronics which may contain magnets, such as headphones, tablets, or iPads.

Companies that make this shunt valve recommend that parents keep magnets in headphones, tablets, or iPads more than 2 inches away from the shunt. No turning motion should be made with these devices either. Cellphones, microwaves, high tension wires and airport security do not interfere with shunts. Any time your child has an MRI, this type of valve must be reset. Our providers can reset these valves.

What do I need to know after surgery?

- Your child will typically be in the hospital overnight after surgery.
- Your child will have stitches that dissolve 3 to 4 weeks after surgery.
- Begin bathing your child's wound 1 or 2 days after the surgery. Wash the wound with soap and water. Gently rinse and pat dry. Do not put your child's incision under water until the wound is completely healed and the stitches are fully dissolved. This usually takes about 6 to 8 weeks.

Will my child have pain?

We partner with you and your child to prevent and relieve pain as completely as possible. You know your child best. We encourage you to take an active part in your child's recovery by talking with your care team about options for your child. After a surgery your child is likely to have some pain and discomfort. In addition to medicine prescribed for pain, we will work with you to create a plan that encourages coping activities to treat pain and provide support, including acetaminophen (Tylenol) and ibuprofen (Motrin). No matter the level of your child's pain, we join you to assess and respond right away. Help your child get better, faster with good pain treatment.

When can my child go back to school and normal activities?

Your child may be able to return back to school within a week; however each child is different. Generally, your child should not go to school if they still need strong pain medicines which may make them sleepy. Your child should limit activity and sports, including swimming, until the wound heals. Your neurosurgery provider will discuss restrictions with you before discharge and at your follow-up visit in clinic.

How long will it take my child's wound to heal?

Your child's wound will take about 6-8 weeks to fully heal.

What are possible complications?

Infection

The risk of your child's shunt getting infected is about 5 out of 100. Infection happens most commonly in the first few months after shunt surgery. Symptoms of shunt infection vary and may not be because of shunt failure.

Infection is usually treated by removing the shunt and placing a temporary drain. Your child will also get medicine (antibiotics) through a small tube (IV) for 2 weeks or less in the hospital. Your child will then have a second surgery to replace the shunt. Symptoms of infection may include:

- Fever of 101.5 degrees Fahrenheit or more
- Different color (irritation) around the wound or along the shunt tract
- Pus at the wound
- Belly (abdominal) pain

Malfunction

Shunts rarely stop working because of bumps or falls. Children with shunts should be allowed to participate in normal activities, sports and recess once recovered from surgery.

However, shunts can malfunction since they are mechanical devices. Your child will begin to feel pressure in their head if the shunt is not working right. Shunt symptoms are different for every child, but may look similar to the signs and symptoms of hydrocephalus listed above.

School

Children with hydrocephalus are at increased risk of learning issues and behavior issues. You may want to consider having an Individualized Education Program (IEP) evaluation. This is not true of all children with hydrocephalus.

Talk to your provider for more information. You can also talk to your child's school or read this handout: [A Teacher's Guide to Hydrocephalus](http://hydroassoc.org/docs/A_Teachers_Guide_to_Hydrocephalus.pdf) hydroassoc.org/docs/A_Teachers_Guide_to_Hydrocephalus.pdf.

When do we come back for a follow-up appointment?

Your child will have:

- An appointment 2 weeks after surgery to check their wound.
- An appointment 2 to 3 months after surgery for a visit and a MRI or CT scan, so your provider can look at your child's ventricles.
- Routine follow-up appointments every year until they are 5.
- After age 5, your child will have appointments every other year. During these visits, we will x-ray to check the shunt tubing. We will use imaging (MRI or CT scan) to check the ventricles in the brain. If your child ever needs surgery that is not related to the shunt, a neurosurgery provider will need to see your child and do imaging within the last year to make sure the shunt is working correctly.

When do I call my healthcare provider?

Call your provider if your child is showing any of the following signs and symptoms:

- Symptoms of shunt malfunction (listed above)
 - Fever of 101.5 degrees Fahrenheit or higher within the first month after surgery
 - Swelling along the shunt tract
 - Irritation along the shunt tract that is a different color and warm to the touch
 - Any fluid draining from your child's wound
 - Moderate to severe pain, especially pain that is not relieved by acetaminophen or ibuprofen
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