Hydrocephalus

What is hydrocephalus?
Hydrocephalus is when too much cerebrospinal fluid (CSF) builds up in the ventricles of your child’s brain. The ventricles are cavities full of CSF and this fluid is always being made.

CSF moves through the brain and is absorbed into the bloodstream. Hydrocephalus happens when the CSF is not absorbed quickly enough. This causes pressure inside your child’s head to build up. Hydrocephalus can happen at birth or happen during your child’s life because of different reasons.

What are the signs and symptoms of hydrocephalus?

<table>
<thead>
<tr>
<th>Infants</th>
<th>Toddlers</th>
<th>Children and adolescents</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Head growth that is larger than normal</td>
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<td>• Vomiting</td>
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<tr>
<td>• Bulging “soft spots” (fontanelles) on your</td>
<td>• Vomiting</td>
<td>• Headaches</td>
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<tr>
<td>baby’s head that may be soft or firm</td>
<td>• Irritability</td>
<td>• Vision problems</td>
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<tr>
<td>• Vomiting</td>
<td>• Sleepiness</td>
<td>• Irritability</td>
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<tr>
<td>• Sleepiness</td>
<td>• Loss of previous abilities (crawling,</td>
<td>• Sleepiness</td>
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<td>• Eyes that seem to look down all the time</td>
<td>talking, etc.)</td>
<td>• Personality change</td>
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<td>• Does not seem to be hungry</td>
<td></td>
<td>• Loss of coordination or balance</td>
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<td>• Irritability</td>
<td></td>
<td>• Decline in academic performance</td>
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My child’s shunt is a __________________________

It is:
- Non-programmable
- Programmable, and set at: ___________________
Hydrocephalus

How is it treated?

Most children need surgery to help drain the CSF from their head. This is done with a long tube called a shunt. The shunt is placed in your child’s brain to move the CSF from the ventricles to your child’s belly (abdomen) or some other part of their body (atrium of their heart, pleural space around their lungs, etc.). This allows the pressure in your child’s head to lessen.

Another possible treatment for hydrocephalus is an endoscopic third ventriculostomy. For this treatment, a shunt is not used. Instead, your child’s provider 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 through this hole into an area of your child’s brain to be reabsorbed. This procedure does not work for all children and your provider will be able to make this decision.

Are there different types of shunts?

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

• A tube that goes into the ventricle where fluid is building up.
• A reservoir and valve that controls how much fluid drains out. This controls the pressure in your child’s head and keeps fluid flowing away from the brain only. The reservoir and valve, although small, can be felt and seen under your child’s skin. This is more obvious in a baby.
• A small tube that comes off the valve and is connected to the area of your child’s body that is chosen for drainage.

A shunt can be placed to drain to the belly, heart or lung.
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 bottom part of the tube is in your child’s belly (peritoneum). This type of shunt is named a ventriculoperitoneal (pronounced ven-trick-yoo-lo-pair-ih-it-tuh-nee-ah) shunt.
- **Heart**: In some cases, the bottom part of the tube is placed in the heart. This type of shunt is called a ventriculoatrial (ven-trick-yoo-lo-ate-RI-al) shunt.
- **Lung**: In other cases, the bottom part of the tube is placed in the lung (pleural space). This type of shunt is called a ventriculopleural (ven-trick-yoo-lo-PLUR-uhl) shunt.

There are no permanent shunts that go outside of your child’s body. Certain shunt systems have adjustable valves which allow your providers to choose a pressure based on the needs of your child.

In some cases, your provider will use a shunt with a valve that can be adjusted from the outside of your child’s body by a small magnet. If this is the valve chosen, we recommend that your child be cautious around magnets, like in headphones, tablets, or iPads.

Generally, your child’s shunt will be fine. Companies that make this shunt state to 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 for 24 hours after surgery.
- Your child will have stitches that will 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. Do not soak until the stitches are fully dissolved. Gently pat dry.

**How can I help my child’s pain?**

Your child might have pain after surgery. If your child has mild pain, talk with your provider about giving them an over-the-counter pain medicine like Tylenol. Your provider may prescribe a stronger pain medicine if the pain is bad. Tell your provider if your child has bad pain for a long time. Always check with your provider before giving your child medicine.

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

Your child may be able to return back to school within a week. Your child should have limited activity and sports, including swimming, until the wound heals.
How long will it take my child’s wound to heal?

Your child’s wound will take between 6 weeks and 2 months to fully heal.

What are possible complications?

Infection

The risk of your child’s shunt getting infected is less than 20%. Infection happens most commonly in the first few months after some 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
• Redness around the wound or along the shunt track
• Pus at the wound
• Belly (abdominal) pain

Malfunction

Shunts are very strong. They rarely malfunction 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.

Vision

Children with a shunt should have their eyes tested every year.

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 Teachers Guide to Hydrocephalus www.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.
• Your child will have another appointment 2 to 3 months for a visit and a scan so your provider can look at your child’s ventricles.
Your child will have routine follow up appointments every year until they are 5.

After age 5, your child will have appointments every other year. During these visits some scans are usually done. If your child ever needs surgery that is not related to the shunt, your child will need to have been seen by neurosurgery within the last year with a scan.

**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° or higher within the first month after surgery
- Swelling along the shunt tract
- Redness along the shunt tract that is bright red and warm to the touch
- Any fluid draining from your child’s wound
- Moderate to severe pain