

Cook Children's

Dept of Neurosurgery

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Doctor: _____

Cerebrospinal fluid (CSF)

CSF circulates around the brain and spinal cord.

CSF is a clear, watery fluid. CSF is *continuously* made in the spaces of the brain called ventricles.

- CSF flows out of the ventricles and circulates around the brain and spinal cord.
- CSF is then absorbed into the bloodstream.

Functions of CSF:

- Acts as a cushion to protect the brain and spinal cord from injury.
- Delivers nutrients to the brain.
- Removes waste products from brain tissues.

Hydrocephalus

Caused by increased CSF in the brain.

If CSF cannot flow normally, fluid builds up inside the ventricles. This causes the ventricles to enlarge and increases the pressure inside the brain. This is called *hydrocephalus*.

Problems:

If left untreated, the enlarged ventricles start placing pressure on the delicate brain tissue. This will soon damage the brain tissue and cause *serious* health problems, including death.

Types of hydrocephalus:

1. **Obstructive hydrocephalus:** Something is blocking the usual flow of the CSF.
2. **Absorptive hydrocephalus:** Inability of the brain to re-absorb the CSF that it is making.

Ventriculoatrial Shunt (VA Shunt)

Ventriculo: Ventricle in the brain.

Atrial: The upper chamber in the heart. The right atrium receives blood from the veins.

VA Shunt: Medical device and tubing that relieves pressure on the brain caused by the buildup of CSF.

We place the tip of the catheter inside the brain ventricle. The tubing then goes under the skin, down the neck, and into right atrium.

Goal of Surgery

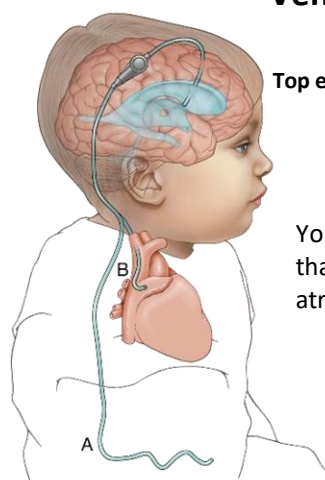
Keep the CSF volume in the ventricles balanced.

The amount of CSF *flowing out* of the ventricles is equal to the amount of CSF *made* in the ventricles.

VA Shunt Surgery

1. We carefully guide the top end of the shunt tip (called the proximal end) into the ventricle and connect the tubing to a pressure valve.
2. The pressure valve controls the flow of fluid by acting like an on-off switch. It opens to release CSF when the pressure builds up and then closes.
3. Excess CSF drains through the bottom end (called the distal end) and flows out into the right atrium. CSF mixes with the incoming blood and is absorbed.

Ventriculoatrial Shunt (VA)



Top end of shunt tube in ventricle.

Your child will only have "Tubing B" that extends down into the right atrium of heart.

Figure 5.

Ventricular shunting systems. A. Ventriculoperitoneal shunt. B. Ventriculoatrial shunt.

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VA Shunt device:

We tunnel the shunt tubing under the skin behind the ear, down the neck, and into the right atrium.

- You may be able to see the outline of the tubing in the neck of a thin child.
- The pressure valve is behind the left or right ear and is usually easy to feel.
- As your child grows taller, the tubing in the atrium may start to move up. If this happens, we may need to replace the shunt.

Post-Operative Care after a VA Shunt

1. Immediately after surgery:

We closely monitor your child.

2. Incision and Dressing

- There will be a small incision on your child's head and chest. We may cover this incision with a gauze dressing.
- Keep the dressing clean and dry.

3. Pain medicine

- Your child may have some discomfort for the first few days after surgery.
- The Neurosurgery team will order pain medicine as needed.

4. Activity

- Your child can return to normal activity when the team tells you it is ok. This is usually at your 1 month follow-up appointment.
- *Do not* exercise, play sports, or rough play until your team approves.

5. Shower or Bath

- You may shower or wash over incision sites 48 hours after surgery.
- You may wash your child's hair with soap and water 48 hours after surgery.
- Do not let incisions get under water until your doctor approves.

6. Follow-up Appointments

We will schedule all follow-up appointments before you go home.

Shunt Malfunction

A shunt is like any other medical device. Problems and complications with a VA shunt can occur. The most common is a shunt malfunction.

Warning signs of a shunt malfunction can appear quickly.

Call your provider or nurse if you see the following:

Infants:

- Full, tense fontanel or head enlargement.
- Bulging scalp veins.
- Swelling or redness along shunt tract.
- Unusual vomiting, fussiness or sleepiness.
- Decreased interest in eating.
- Downward looking of the eyes.

Older children:

- Headaches, vomiting, fussiness, tiredness.
- Swelling or redness along the shunt tract.
- Loss of previous abilities.
- Constant downward looking of the eyes.

Shunt Infection

The VA shunt is a foreign body. Any implanted foreign body is at risk for infection.

Call your provider or nurse if you see the following:

- Redness around the area of the incision.
- Yellow discharge from the incision.
- Temperature higher than 102 F.
- Fever lasting longer than 48 to 72 hours after surgery.

These instructions are only general guidelines. Your surgeon may give you special instructions. If you have any questions or concerns, please ask a member of the Neurosurgery team.