

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.
- The blood vessels of the brain reabsorb the CSF 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 will start placing pressure on the delicate brain tissue. This can damage 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.

## Ventricular Access Device (VAD)

**Ventricular:** Ventricles in the brain.

**Access Device:** Small reservoir placed under the baby's scalp. It is connected to a tube placed inside the ventricle.

### Goal of Surgery

Keep the CSF volume in the ventricles balanced.

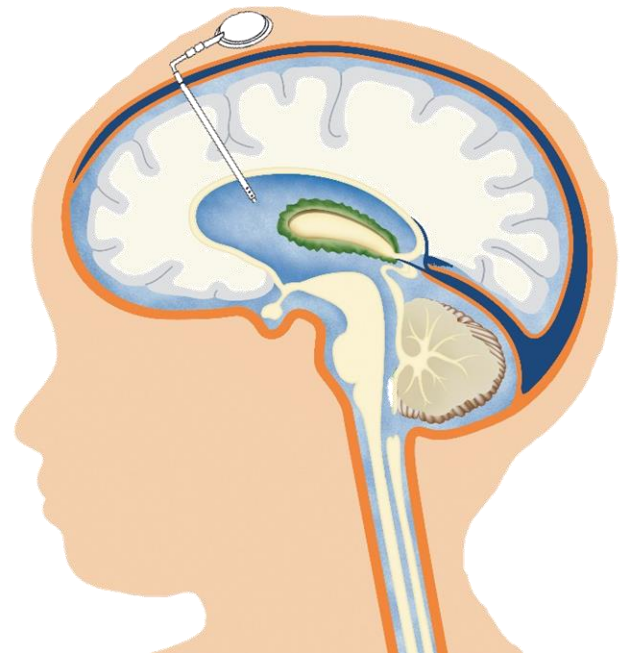
The amount of CSF *flowing out* of the ventricles is equal to the amount of CSF *made* in the ventricles.

## VAD Surgery and your premature baby

### Premature babies:

- May not weigh enough for placement of a permanent shunting device.
- May be at a higher risk for developing an infection following surgery.

The VAD is a *temporary* device. We use the VAD to remove excess CSF until your baby grows and gains weight.



## VAD Device and your NICU nurses

Your NICU nurses are specially trained to remove excess CSF from the VAD.

- Your neurosurgery team will decide how much CSF the nurses need to remove and how often.
- Your nurses use sterile technique to clean the VAD site. They will insert a needle into the VAD reservoir and slowly withdraw excess CSF.

## Post-Operative Care in NICU

### 1. Immediately after surgery:

We closely monitor your baby.

### 2. Incision and Dressing

- There will be a small incision on your baby's head.
- We may cover this incision with a gauze dressing. The nurses will keep the incision clean.
- There may be some swelling around the incision. It is not uncommon to have a small amount of fluid collecting around the VAD reservoir.
- We will check the incision frequently for any leaking or signs of infection.

### 3. Pain medicine

- Your baby may be fussy and have a small amount of discomfort for the first few days after surgery.
- Most infants do very well with pain and only need a mild pain medicine such as acetaminophen (Tylenol™).

### 4. Shower or Bath

48 hours after surgery:

- You may gently wash-over incision site.
- You may wash your baby's hair with soap and water or a gentle shampoo.
- Do not let incisions get under water until your doctor approves.

## 5. Head Ultrasounds

Your infant may need several head ultrasounds. This helps us monitor the amount of fluid in the ventricles.

**Your infant will stay in NICU while the VAD is in place.**

Your Neurosurgery team will:

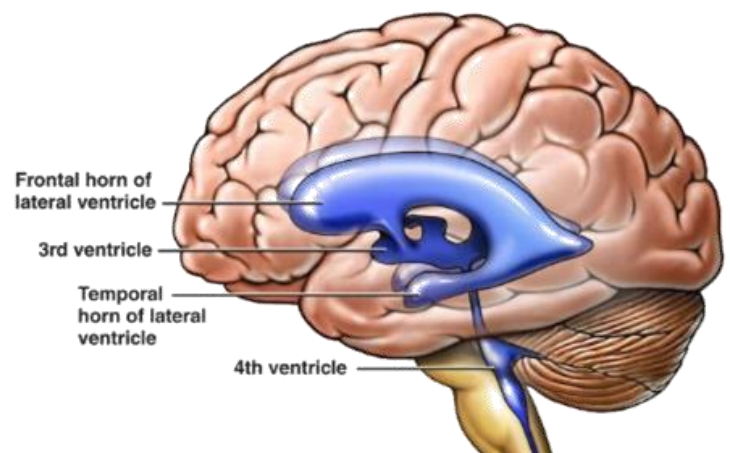
- Continue to check on your infant's progress and weight gain.
- Closely monitor the amount of CSF in the ventricle.
- Check for signs of increasing hydrocephalus.
- Determine when we can safely remove the VAD.
- Decide if and when your infant may need a permanent shunting device.

## VAD Shunt Infection

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

Your health care team will watch for any signs of infection. This may include:

- 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.



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