

Hydrocephalus

Hydrocephalus is when there is too much fluid inside or around the brain. This fluid is cerebrospinal fluid (CSF) — the clear fluid that surrounds and cushions the brain and spinal cord. Backup of CSF happens when it cannot drain from the brain or skull. The backup of CSF can cause the skull to become larger, can increase the pressure inside the brain, and can be harmful to the brain.

Cause

CSF levels in the brain rise if:

- The flow of CSF is blocked.
- It does not get absorbed into the blood properly.
- The brain makes too much of it.

Hydrocephalus can be congenital, meaning that it happens before your baby is born, or it can start later in life.

Hydrocephalus can affect the brain and your baby's development. The extent of the problem depends on the severity of the hydrocephalus, and the presence of other problems such as:

- Genetic defects
- Certain infections during pregnancy
- Bleeding inside the head
- Tumors in the brain or spinal cord
- Injury
- Prematurity
- Abnormalities of brain development

How hydrocephalus is found

You may have a prenatal ultrasound done while you are pregnant to learn about the health of your baby. Hydrocephalus may be found during a routine prenatal ultrasound, but sometimes it is discovered when your baby is born.

Symptoms of hydrocephalus:

- Rapid increase in head size
- Bulging soft spot (fontanelle) on the top of the head
- A shiny scalp, with obvious blood vessels
- A downward gaze and retracted eyelids, which reveal the whites of the eyes above the pupil, “sun-setting of the eyes”

If pressure in the baby's head builds, symptoms will get worse and may include:

- Irritability
- Excessive sleeping
- Poor feeding and frequent vomiting
- Breathing or swallowing problems

Care during your pregnancy

Your doctor will have a detailed plan to watch your pregnancy very closely. If you need a cesarean section (C-section), your doctor will discuss it with you. It is important to call your doctor if you have any questions or concerns during your pregnancy.

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Ohio Fetal Medicine Collaborative

If this problem is found while you are pregnant, you will continue to receive care from your doctor and may be referred to the Ohio Fetal Medicine Collaborative (OFMC).

Through the OFMC, you will see a doctor who specializes in taking care of high-risk patients. You will also meet with a pediatric neurosurgeon at Nationwide Children's Hospital to learn more about the care of your baby's CSF backup after birth. You may also meet with a pediatric neurologist at Nationwide Children's Hospital to learn more about your baby's brain development. Nurse coordinators will be available to help answer your questions and concerns, guide you through your pregnancy, and prepare you for what to expect.

You will deliver your baby at a hospital that is prepared to care for high-risk babies.

Care after your baby is born

At the delivery hospital, a neonatologist (a doctor who specializes in treating newborns) will manage the care of your baby.

Your baby's head may appear larger than normal. Your baby's head size will be measured.

Your baby may have several tests to confirm hydrocephalus and look for the cause.

- Ultrasound
- Magnetic resonance imaging (MRI)
- Computed tomography (CT) scan

Depending on your baby's condition:

- Your baby may be able to breastfeed or feed from a bottle and go home with you. It is very important for your baby to follow up with the neurosurgeon in the office for a complete evaluation.
- Your baby may receive care in the hospital's neonatal intensive care unit (NICU).

- An intravenous line (IV) may be started in your baby's arm, hand, foot or scalp. The IV provides fluids, medicines, nutrients and antibiotics to prevent dehydration and infection.
- Your baby may be transferred to the NICU at the Main Campus of Nationwide Children's Hospital for further care.
- You and your baby will be linked with a physical or occupational therapist to help meet your baby's developmental and individual needs.

Treatment

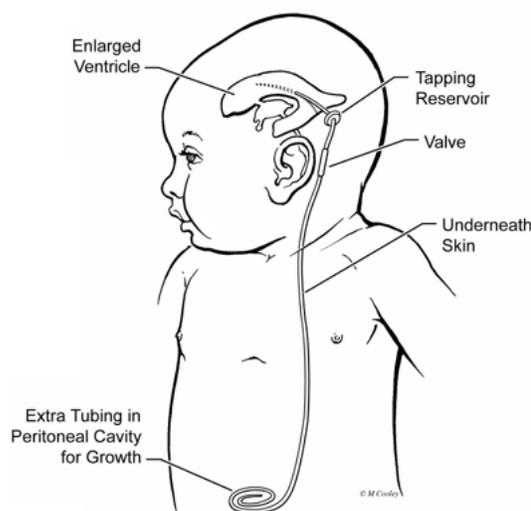
If treatment is needed, the goal is to reduce the pressure in the baby's head and to drain the cerebral spinal fluid (CSF).

Surgery may be needed to treat hydrocephalus.

A common treatment for congenital hydrocephalus is placing a ventriculoperitoneal shunt (VP shunt). A shunt redirects extra fluid inside of the brain to another part of the body, such as the abdomen, where it can be absorbed.

The VP shunt usually runs behind the ear. The tubing threads under the skin to the area of the abdomen.

Ventriculoperitoneal (VP) Shunt



continued

Endoscopic third ventriculostomy (ETV) with choroid plexus cauterization (CPC)

An alternative to shunt placement for the treatment of hydrocephalus in some patients is endoscopic third ventriculostomy (ETV). CSF leaves the brain through an opening made deep in the floor of the brain. This procedure may be used in place of a shunt when hydrocephalus is caused by certain CSF flow blockages.

In children younger than 1 year old, ETV must be combined with choroid plexus cauterization (CPC). CPC reduces the amount of CSF made in the brain. If you think of hydrocephalus like a blocked sink, the ETV creates a new drain and the CPC slows the amount of water coming from the faucet.

Care after surgery

After surgery, your baby will receive care in the hospital's Neonatal Intensive Care Unit (NICU). Your baby will need to be on a breathing machine until he or she is fully recovered from surgery.

Other treatments your baby will probably need after surgery are:

- Antibiotics to prevent infection
- Fluids and nutrients given through an IV
- Pain medicines as needed

The total length of time your baby will stay in the hospital will vary. It will depend on whether your baby is born with other health issues. You may be able to take your baby home once he or she is feeding well and gaining weight.

Complications from shunts:

- infection
- bleeding
- malfunction (blockage)

Follow up

Your baby will need regular follow-up appointments to measure growth, development and nutrition. You will want to find a local pediatrician to take care of the routine checkups, immunizations, and doctor's visits. The program coordinator can help if needed.

Your child will need to be seen by the pediatric neurosurgeon to check his growth and development and that the shunt or ETV-CPC is working properly.