

Hydrocephalus

Hydrocephalus is the abnormal enlargement of the brain cavities (ventricles) caused by a build-up of cerebrospinal fluid (CSF). Usually, the body maintains a constant circulation and absorption of CSF. Untreated, hydrocephalus can result in brain damage or death. There is no cure, but hydrocephalus can be managed with surgery.

Cerebrospinal fluid (CSF) is a clear fluid that is made and absorbed by the brain. CSF circulates through the cerebroventricular (brain cavity) system and then through the subarachnoid space that surrounds the brain and spinal cord. It serves to protect and nourish the brain and spinal cord.

Symptoms

Hydrocephalus sometimes has no symptoms (it is asymptomatic). When symptoms occur, they can include:

- Difficulty in walking
- Incontinence
- Memory problems
- Headache
- Nausea and vomiting
- Loss of consciousness
- Vision problems
- Hearing sensitivities
- Seizures
- Enlarged skull (infants).

The movement of cerebrospinal fluid

The brain contains cavities called ventricles. Cerebrospinal fluid is made in the ventricles, then flows down channels through the brain and exits near the base of the skull. The fluid then moves to the surface of the brain and spinal cord and is absorbed just below the top of the skull.

If the movement of CSF is hampered along any point of this journey, the fluid will build up behind the blockage. The ventricles enlarge with fluid and pressure rises inside the skull (intracranial pressure).

A range of causes

Hydrocephalus can be caused by problems with CSF secretion, CSF flow or CSF absorption. The different categories of hydrocephalus include:

- **Congenital hydrocephalus** – is present from birth and is associated with other birth defects such as spina bifida and Dandy-Walker syndrome.
- **Acquired hydrocephalus** – can be triggered by tumours, infection or bleeding within the brain that blocks the movement or absorption of CSF.
- **Normal pressure hydrocephalus** – older people are more commonly affected. Generally, CSF outflow over the surface of the brain is reduced, for unknown reasons.

Diagnosis methods

The various tests used to diagnose hydrocephalus include:

- Physical examination
- Eye examination
- CT scan
- MRI scan.

Treatment options

Treatment depends on the underlying cause, but can include:

- **Drugs** – for example, antibiotics are given in the case of infection. Surgery is needed if clearing the infection doesn't resolve the hydrocephalus.
- **Surgery** – the cause of the blockage is surgically removed. In cases of temporary hydrocephalus, a small catheter may be inserted to allow the fluid to drain while the underlying cause (such as bleeding) has time to resolve. In other cases (such as congenital hydrocephalus), a permanent tube (shunt) is inserted to allow the excess CSF to drain out.
- **Wait and see approach** – if hydrocephalus is found incidentally (for example, during a CT or MRI examination for other reasons) and is not causing any symptoms, no specific treatment other than careful review and monitoring by a doctor may be needed.

Surgical treatment

The two main types of surgery for hydrocephalus include:

- **Ventriculoperitoneal shunt** – this operation can relieve hydrocephalus irrespective of the cause. The neurosurgeon cuts a hole into the skull to access the brain. A small tube is inserted into one of the lateral (side) ventricles of the brain and is tunnelled underneath the skin to the abdomen. Another incision is made in the abdomen to access the peritoneal (abdominal) cavity. The tube is inserted into the peritoneal cavity, where the excess CSF will drain and be absorbed back into the body. A one-way valve is programmed to control the drainage of CSF. Shunts may be temporary or permanent.
- **Surgery to address the cause of the hydrocephalus** – for example, hydrocephalus may be due to a narrowing (stenosis) of the connection between the ventricles causing a flow obstruction. This type of hydrocephalus may be cured by an endoscopic third ventriculostomy – where the neurosurgeon cuts a hole into the skull to access the brain. A small camera attached to a flexible instrument called an endoscope is inserted into the lateral ventricles of the brain. A tunnel is formed to correct the disturbance of flow that is causing the hydrocephalus.

Where to get help

- Your doctor
- Neurologist
- Neurosurgeon
- Spina Bifida Association of Victoria Tel. (03) 9663 0075.

Things to remember

- Hydrocephalus is the abnormal enlargement of the brain cavities (ventricles) caused by a build-up of cerebrospinal fluid (CSF).
- Hydrocephalus can be caused by problems with CSF secretion, CSF flow or CSF absorption.
- Depending on the underlying cause, surgery for hydrocephalus includes removal of the blockage, or insertion of a small tube (shunt) to allow the excess CSF to drain out.

This page has been produced in consultation with, and approved by:

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