

## Fact Sheet

### What is hydrocephalus?

Hydrocephalus comes from the Greek words:

**hydro** • **cephalus**  
meaning water      meaning head

Hydrocephalus is an abnormal accumulation of fluid – cerebrospinal fluid (CSF) – within cavities called ventricles inside the brain. This condition may occur at any age.

CSF is produced in the ventricles, circulates through the ventricular system in the brain, and is absorbed into the bloodstream. CSF is in constant circulation and has many functions. It surrounds the brain and spinal cord and acts as a protective cushion against injury. CSF contains nutrients and proteins that are needed for the nourishment and normal function of the brain. It carries waste products away from surrounding tissues.

Hydrocephalus occurs when there is an imbalance between the amount of CSF that is produced and the rate at which it is absorbed. As the CSF builds up, it causes the ventricles to enlarge and the pressure inside the head to increase.

### What causes hydrocephalus?

Hydrocephalus is a condition, not a disease. It can develop for a variety of reasons, sometimes as part of another condition.

Hydrocephalus that is congenital (present at birth) is thought to be caused by a complex interaction of genetic and environmental factors. Aqueductal stenosis, an obstruction of the cerebral aqueduct, is the most frequent cause of congenital hydrocephalus. Hydrocephalus is believed to occur in about 1.5 per 1,000 births.

Hydrocephalus that is acquired may result from intraventricular hemorrhage, meningitis, head trauma, tumors, or cysts. Over 1,000,000 people suffer with the condition in the United States.

Normal Pressure Hydrocephalus (NPH) occurs when the ventricles of the brain are enlarged, but there is little or no increase in the pressure within the ventricles. Sometimes the cause of NPH is known – but most often it is idiopathic, which means the cause is not known. NPH is most common in older adults.

### How is hydrocephalus treated and what are the effects of the condition?

There is no known way to prevent or cure hydrocephalus. To date, the most effective treatment is surgical, most commonly the insertion of a shunt. A shunt is a flexible tube placed into the ventricular system of the brain which diverts the flow of CSF into another region of the body, most often the abdominal cavity, where it can be absorbed. A valve within the shunt maintains the CSF at normal pressure within the ventricles.

- Over 36,000 shunt surgeries are performed each year (an average of one every 15 minutes).
- The cost of shunt surgeries is over \$1 billion per year, not including rehabilitative therapy or educational accommodation.
- The average cost per surgery is over \$40,000.
- 50% of shunts will fail within 2 years, and 70% of all shunts fail within 10 years, making shunt procedures the number one reason for brain surgery in children.

Individuals shunted in childhood are likely to face some or all of the following:

- Learning disabilities, motor impairments and deficits in visual and auditory processing that require accommodations in school.
- Socialization challenges.
- Repeated brain surgeries.
- Life and death decisions every time symptoms of shunt malfunction appear.
- Adults with hydrocephalus are less likely to have a college degree, drive a car, live independently, be in a relationship, or have a job.

### What is being done about this problem?

Despite being a major public health burden affecting over a million people in the U.S. alone, surprisingly little public or private investment is currently made into understanding and improving outcomes for people with hydrocephalus. Shockingly, less than \$5 million per year in public and private money combined is directed to hydrocephalus research. The Hydrocephalus Association aims to improve this situation by increasing both public and private funding for research. Through this commitment to funding research, we will improve the quality of life for people living with hydrocephalus and we will, ultimately, find a cure.

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For additional resources about hydrocephalus and information about the services of the Hydrocephalus Association, please contact:



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