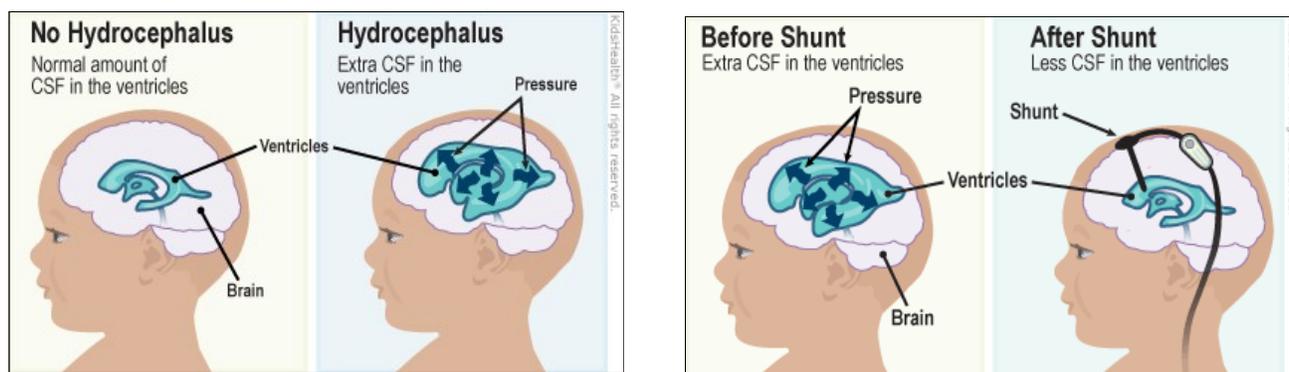


# HYDROCEPHALUS

## What is it?

Hydrocephalus is caused by a build up of excess cerebrospinal fluid (CSF) in the ventricles in the brain. Normally there is a balance between the rate at which CSF is produced and the rate it is absorbed. When this delicate balance is disrupted, hydrocephalus occurs. There are many factors that disrupt this balance with the most common being a blockage. Without a release of excessive fluid, pressure in the brain will increase and cause brain damage. Congenital hydrocephalus exists at birth while acquired hydrocephalus is the result of an issue after birth such as stroke, hemorrhage, infection, cysts, or trauma. Hydrocephalus is a life threatening condition. Although hydrocephalus can occur at any age, it is most common in infants and those over age 60. Comorbid conditions include spina bifida, cerebral palsy, and Dandy Walker syndrome. (See SHNIC's factsheet section on Medical Conditions for more information on these conditions.)



## What are the characteristics or complications?

Similar to most disorders, symptoms will vary from child to child. Symptoms might also vary based on the child's age. Symptoms could include the following:

- Unusually large head size, rapid increase in head size (usually seen in infants)
- Headaches
- Impaired vision
- Seizures
- Cognitive difficulties
- Muscle weakness
- Hearing loss
- Loss of coordination
- Incontinence
- Sleepiness
- Irritability

## What is the treatment?

While there is no cure for hydrocephalus, treatments available focus on relieving the pressure on the brain. One of the most common treatments is brain surgery involving the placement of a shunt. A shunt is an implanted device used to drain extra cerebral spinal fluid (CSF) that circulates around the brain and spine. (See SHNIC's Shunt factsheet). Another surgery performed for hydrocephalus is called endoscopic third ventriculostomy (EVT). EVT surgery involves making a tiny hole in the third ventricle of the brain to allow CSF to flow into another area of the brain for reabsorption. EVT is the preferred surgery for obstructive hydrocephalus. Those diagnosed with hydrocephalus will often be followed by numerous specialists including neurosurgeons, neurologists, neuropsychologists, eye specialists, and other healthcare professionals. A team of medical and developmental specialists are key to the best possible outcome.



Kennedy Krieger Institute

The **Specialized Health Needs Interagency Collaboration (SHNIC)** program is a collaborative partnership between the Kennedy Krieger Institute and the Maryland State Department of Education.

## Suggested school accommodations

Pressure on the brain from hydrocephalus can cause short and long term effects. Often these children experience some degree of learning difficulty including retrieving stored information, issues with abstract concepts, and spatial/perception disorders. They can also have poor motor coordination making them appear clumsy and poor fine motor skills affecting handwriting, use of scissors, etc. Supporting students with this condition in the school requires educators and parents/guardian to work as a team. Some accommodations to consider for a 504/IEP could include:

- Monitoring for visual impairment
- PT/OT/SLP consult to identify needs
- Monitor coordination/motor skills
- Providing clear schedules
- Chunking information
- Tools to aid in memory
- Allowing extended time for response
- Use of discussion rather than lecture
- Offer clear, concise direction
- Offer rest breaks as appropriate
- Break down complex tasks
- Consider assistive technology
- Staff education/training as appropriate
- Emergency Evacuation plan (EEP)

### Specific health issues for Individualized Healthcare Plan

- Diagnosis including all affected systems, symptoms, and any other associated conditions
- Current medication list for home and school
- Healthcare provider orders for physical activity restrictions
- Child specific signs and symptoms of increased intracranial pressure
- Orders for emergency medications, when to administer, dose, route
- Plan for monitoring neurological changes, headaches, anxiety, depression
- Plan/protocol for chronic pain
- Provide rest area if needed
- Communicate with school staff, parents, and provider any changes or concerns about the disease
- Medical device information (see SHNIC's "Medical Device Information Guide")
- Emergency Care Plan (ECP) related medical needs in the school setting and staff training as appropriate for each

#### Resources & Manuals

##### American Association of Neurological Surgeons-Hydrocephalus

<https://www.aans.org/Patients/Neurosurgical-Conditions-and-Treatments/Hydrocephalus>

##### Hydrocephalus Association

<https://www.hydroassoc.org/hydrocephalus/>

##### Mayo Clinic-Hydrocephalus

[https://www.mayoclinic.org/diseases-conditions/hydrocephalus/symptoms-causes/syc-20373604?utm\\_source=Google&utm\\_medium=abstract&utm\\_content=Hydrocephalus&utm\\_campaign=Knowledge-panel](https://www.mayoclinic.org/diseases-conditions/hydrocephalus/symptoms-causes/syc-20373604?utm_source=Google&utm_medium=abstract&utm_content=Hydrocephalus&utm_campaign=Knowledge-panel)

##### National Institute of Neurological Disorders and Stroke-Hydrocephalus Fact Sheet

<https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Hydrocephalus-Fact-Sheet>