

# Hydrocephalus & Shunts:

## *Frequently Asked Questions*

### *What are the treatments for hydrocephalus? Are they permanent?*

A shunt, which has been used to treat hydrocephalus since the 1950s, is a device that allows excess cerebrospinal fluid (CSF) to get “shunted” (moved) to another area of the body. As the pressure of CSF inside the brain increases, the one-way valve opens and the excessive fluid drains to the downstream cavity. As there is no cure for hydrocephalus, these treatments are, in fact, permanent. They allow patients to lead normal lives without limitations.

### *What are the different types of shunts?*

The choice of shunt depends on the type and blockage location that characterizes the patient’s hydrocephalus. The type of shunt system is named by the inflow and outflow locations. Most hydrocephalus patients undergo shunt placements, chosen from the types below:

**Subdural-peritoneal shunt (SDP)** – shifts fluid from subdural space to peritoneal cavity

**Ventriculo-peritoneal (VP) shunt (most common)** – shifts fluid from the brain into the peritoneal cavity (a fluid-filled gap between the walls of the abdomen and the organs in the abdomen)

**Ventriculo-pleural (VPL) shunt** – shifts fluid from the brain into the pleural cavity (space between the walls of the lung)

**Ventriculo-atrial (VA) shunt or “vascular shunt”** – shifts fluid from the brain to the right atrium (upper right chamber) of the heart

**Ventriculo-gallbladder (VGB) shunt** – shifts fluid from the brain to the gallbladder. Often used in cases of hydrocephalus when treatment with other shunt locations is not possible

### *These shunts have the following additional features:*

**Fixed pressure shunt (most common)** – regulates the flow-rate of the fluid based on a predetermined pressure setting; used for specific situations in which fluid output needs to be regulated

**Programmable shunt** – adjusts how much fluid is drained by a patient’s VP shunt, even after that shunt has been placed, because it is externally adjustable by a magnetic device

### *What does shunt surgery entail?*

In shunt surgery, one catheter is threaded into the fluid space through a tiny skull opening. The other catheter goes behind the ear. This tube travels down the neck, then chest and abdomen, allowing excess fluid to drain into the abdominal cavity where the body absorbs it. A tiny pump (also referred to as a *valve*) is then attached between both catheters. All of this is placed under the skin. When the pressure in the ventricles is increased, the valve will automatically activate to shunt the fluid out of the brain.

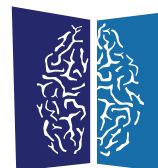
Shunt surgery takes less than an hour. In addition, as the entire shunt is implanted either within the skull or under the skin, no components of the shunt are visible outside of the body. Recovery from a VP shunt placement takes about one to two days.

At ANA, we are a highly experienced multidisciplinary team that treats hundreds of hydrocephalus patients annually. Our team walks each patient through the shunt implantation surgical process from beginning to end.

### *What are the signs of a shunt malfunction?*

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# Hydrocephalus & Shunts:

## *Frequently Asked Questions (Cont'd.)*

Although a shunt works well and saves lives, we recognize that complications can occur with its use. Complications include malfunction (shunt failure) blockage or infection. A shunt may also disconnect, break or become too short or less effective. Our neurosurgeons are fully equipped to help avoid and rectify any shunt problems.

**Symptoms below represent possible shunt malfunction:**

- Headaches
- Vomiting
- Lethargy (sleepiness)
- Irritability
- Swelling or redness along the shunt tract
- Seizures
- Fever
- Weakness or gait issues
- Incontinence
- Periods of confusion
- Decreased school performance

It is important to note that more subtle signs can include fatigue, behavioral changes, lethargy and/or decline in academic performance.

### ***What is shunt maintenance following surgery?***

At ANA, we are focused on the importance of follow-up care after shunt surgery. As part of our shunt maintenance, patients are reevaluated on a regular basis or as needed in the presence of any post-surgical signs, symptoms or concerns, with or without imaging. All patients and/or caregivers are educated to understand any shunt-related symptoms and encouraged to contact ANA with any concerns.

### ***Are there other surgical methods for treating hydrocephalus?***

The neurosurgeons at ANA are pioneers in endoscopic third ventriculostomy (ETV), a minimally invasive procedure relevant for patients for whom hydrocephalus follows certain criteria. In ETV, surgeons make an opening in the floor of the brain's third ventricle, allowing trapped fluid to drain through its normal pathway. However, if the ETV fails a shunt placement would be needed.

