HYDROCEPHALUS: The Facts

What is it?
Hydrocephalus is the accumulation of excess cerebrospinal fluid (CSF) in the brain.
(\textit{Hydro}=Water, \textit{Cephalus}=Head)
CSF is a watery substance containing proteins, salts and sugars which protect and nourish the brain and spinal cord tissues. Our brain also contains four interconnecting cavities called ventricles in which CSF flows between the surface of the brain and the skull acting like a cushioning agent for the brain. CSF is continually being produced and absorbed buy the body. Hydrocephalus occurs when the CSF cannot circulate properly and an excess of this fluid causes intracranial pressure.

Types of Hydrocephalus
- \textbf{Obstructive}
  This form also called non-communicating hydrocephalus, occurs when a blockage in a ventricle restricts the flow of CSF

- \textbf{Non-obstructive}
  This form also called communicating hydrocephalus occurs when CSF is not absorbed properly into the bloodstream

- \textbf{Normal Pressure Hydrocephalus}
  Occurs often with age as the result of a gradual blockage and build-up of CSF

- \textbf{Congenital}
  Occurs during fetal development and is present at birth

- \textbf{Acquired}
  Occurs after birth usually as a result of trauma to the brain through infection or injury, meningitis or tumor

Symptoms
- \textbf{Infant / Toddler:}
  - Enlarged head
  - Bulging or tense Fontanelle (soft spot)
  - Irritability
  - Lethargy
  - Downward displacement of the eyes
  - Seizures
  - High pitched crying

- \textbf{Children / Adults:}
  - Headache
  - Nausea and vomiting
  - Vision problems
  - Fever
  - Irritability
  - Lethargy
  - Loss of coordination
  - Decline in performance
  - Personality changes

When left untreated, hydrocephalus can cause serious brain damage and even death.

Cause
Scientists believe that congenital hydrocephalus is a result of environmental and genetic factors while Acquired version are the results of trauma and/or injury to the brain.

Did you know that 80-90\% of people with Spina Bifida have Hydrocephalus?

A shunt (small drainage tube) was invented in the 1950’s by John Holter, an engineer whose son had hydrocephalus?
Treatment of Hydrocephalus

There is no cure for hydrocephalus, however, the surgical insertion of a shunt can control the condition. A shunt is a long, flexible tube with a one way valve. The most common of which is the Ventriculoperitoneal (VP) shunt.

The excess of CSF is re-directed using the shunt which is inserted under the skin from the brain to the abdomen. The CSF is then absorbed into the bloodstream.

Another type of shunt re-directs the CSF from the brain to the heart.

After shunt insertion, most people with hydrocephalus will lead normal lives with few limitations.

Another treatment option is an Endoscopic Third Ventriculostomy. In which a small hole is created in the floor of the brain using a laser. CSF can then naturally flow through this opening.

Cautions with Shunts

People with hydrocephalus will have their shunt tubing replaced at least once due to growth. The shunt may also have to be replaced due to a number of complications. The most common of such complications are:

Obstruction
The tubing may become plugged with blood elements, brain fragments or tumor cells. Scar tissue or structures may obstruct the ends of the tubing as well. Symptoms of an obstructed shunt are similar to those for hydrocephalus.

Infection or Erosion
Infection should be suspected is there is unusual swelling along the shunt tract visible behind the ear.

Overdrainage
Symptoms are similar to those of hydrocephalus with the most common being a severe headache which is reduced when lying down.