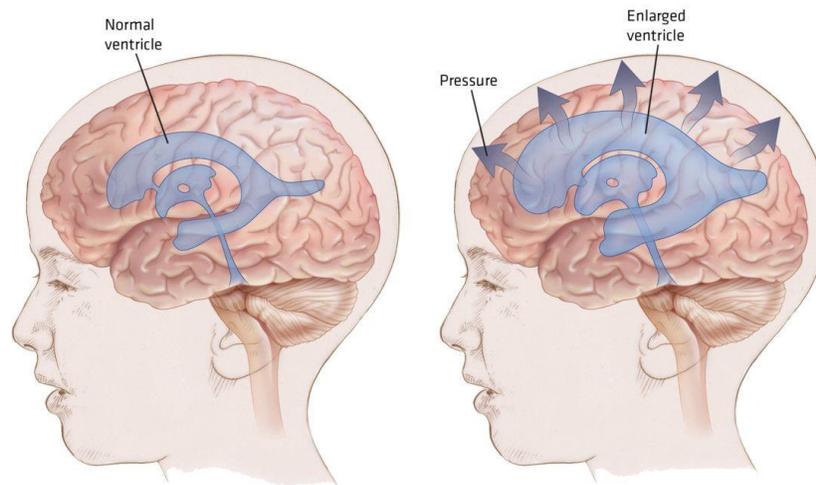


Appendix 4- Management of Post- Hemorrhagic Ventricular Dilatation (PHVD) Information for Parents

What is Post- Hemorrhagic Ventricular Dilatation (PHVD) ?

Our brain and spinal cords are surrounded by fluid called cerebrospinal fluid (CSF). CSF is continuously produced within small chambers inside the brain called ventricles. It is produced by small, delicate tufts of specialized tissue called the choroid plexus. CSF passes through small spaces into the subarachnoid space, goes around the spinal cord and finally gets absorbed by small absorptive sites (arachnoid villi) over the surfaces of the brain. When babies have bleeding inside the ventricles (Intraventricular hemorrhage, IVH), this can lead to blockage of CSF pathway, or inability to absorb CSF. In either condition, CSF can start to build up inside the ventricles leading to ventricular dilatation (Post- Hemorrhagic Ventricular Dilatation, PHVD) PHVD especially if not adequately treated can increase the risk of neurodevelopmental impairment.



Why do babies develop IVH?

Intraventricular hemorrhage (IVH) in newborns is a condition that happens when blood vessels inside a newborn baby's brain bleed. It is most common in newborns who born very premature.

Is there a way to prevent IVH?

There is no way to completely prevent intraventricular hemorrhage. However, there are measures done before birth (e.g. prenatal steroids), during birth (e.g. delayed cord clamping) and after birth (e.g. bundle care of very premature infants) which can decrease this risk.

How can PHVD be detected and its severity measured?

Doctors can test for this condition with an ultrasound of the baby's head. An ultrasound uses sound waves to create pictures of the inside of the body. Measurements of the sizes of the ventricles using head ultrasound were found to be the earliest and best measure for this condition.

Are there signs I can see in my baby due to PHVD?

Although PHVD can cause rapid head growth , wide head sutures and increased respiratory events, these findings often appear later than ultrasound findings.

What consulting services will my baby need?

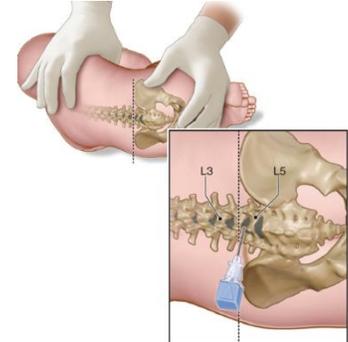
The NICU team might want to consult specialists from Boston Children's hospital to help with medical management (pediatric neurologists) and possible surgical management (neurosurgeons) for your baby.

What are the types of treatment my baby might need?

There are different types of procedures which can help. The decision to do a specific procedure depends on many variables including the age, weight, and general condition of your baby. Your baby might need none, one or more of these procedures.

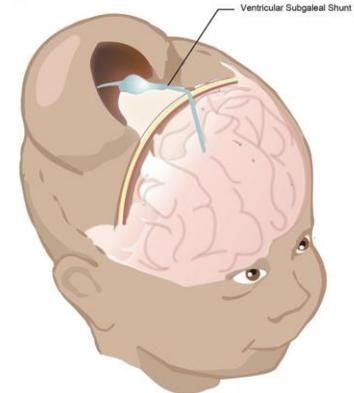
- **Lumber puncture (LP)**

A lumbar puncture is procedure in which a doctor uses a needle to get fluid (CSF) from your infants' lower back. In this procedure, your infant lies on the side and is held still, and a doctor puts a needle between the bones of the lower back. It does not go near the spinal cord. This procedure allows relieving some of the pressure caused by fluids accumulating in the ventricles.



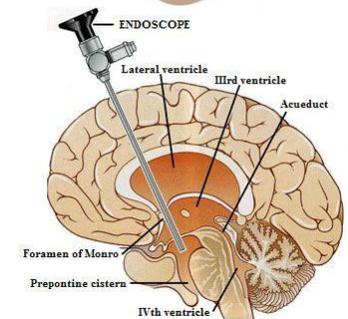
- **Ventricular-subgaleal shunt**

In this neurosurgical procedure, a small tube is inserted inside the ventricles under anesthesia. This tube allows CSF inside the ventricle to go to a chamber (reservoir) outside the head but under the scalp, then freely travels into a space naturally present under the scalp (Subgaleal space). Following this procedure, sometime the doctors use a small needle to get fluids out of this reservoir if needed.



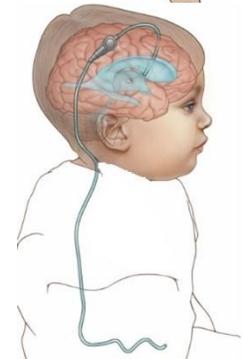
- **Endoscopic third ventriculostomy/ Choroid plexus cauterization (ETV/CPC)**

In this neurosurgical procedure, the neurosurgeons use a small camera and small tools to create a pathway for the CSF trapped. In same surgery they might want to cauterize the choroid plexus to produce less CSF.



- **Ventriculoperitoneal Shunt (VP Shunt)**

In this neurosurgical procedure, the neurosurgeons place a tube called a shunt under the skin from the ventricles to the abdomen. The shunt channels the flow of fluid away from the brain or spinal cord into abdominal cavity, where the fluid can be absorbed.



We realize this is a difficult time for you and your family. Your baby is being cared for by a large team of doctors, nurses, respiratory therapists, social workers, and family support personnel. Any member of your baby's team will be happy to answer your questions and concerns.