

UNDERSTANDING Intraventricular Hemorrhage

IVH



What is intraventricular hemorrhage (IVH)?

The **ventricles** are spaces inside the brain. Ventricles contain a liquid, called **cerebrospinal fluid**, that is important for brain function. With IVH, small blood vessels near the ventricles break and leak blood into the ventricles.

What are the risk factors for IVH?

The highest risk for IVH is in babies born more than 10 weeks early. Premature babies are also at higher risk for IVH if they have other health problems, such as **respiratory distress syndrome**, infection, or unstable blood pressure, or if the mother had an infection before the baby was born.

What are the symptoms of IVH?

Many babies with IVH do not have any symptoms. When symptoms occur, they may include:

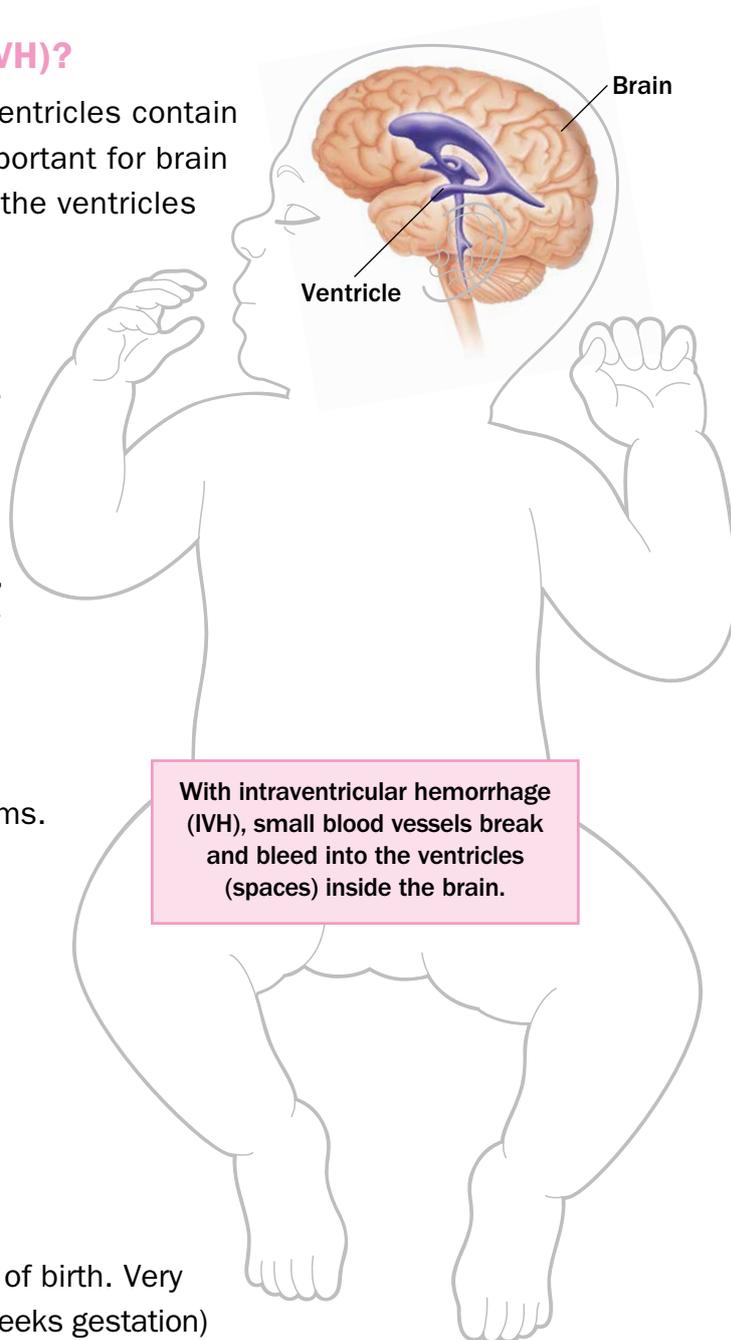
- Short stops in breathing (**apnea**)
- Low blood pressure
- Slow heart rate
- Decreased muscle tone and reflexes
- Seizures

How is IVH diagnosed?

Almost all cases of IVH occur within one week of birth. Very premature babies (born at less than 30 to 32 weeks gestation) are routinely screened for IVH before they are 14 days old. Premature babies are usually screened if they have risk factors, such as breathing problems or an infection. Babies are screened for IVH using an **ultrasound** machine. This machine generates a picture of the baby's brain. The test is painless and is usually done at the bedside in the NICU.

What are the different grades of IVH?

There are four grades of IVH. With grades 1 and 2 IVH, there is a small amount of bleeding in the ventricles. With grade 3 IVH, there is enough bleeding that the ventricles become enlarged. With grade 4 IVH, blood leaks from the ventricles into the brain tissue.



Treating Intraventricular Hemorrhage

Does IVH cause permanent problems?

The long-term impact of IVH depends on both the amount of bleeding and the location of the bleeding within the brain. In most cases, babies with grade 1 or 2 IVH do not have any long-term problems as a result of the bleeding.

Babies with grade 3 or 4 IVH may develop blood clots that block the movement of the fluid through the ventricles. This is called **hydrocephalus**. With this extra fluid, the ventricles may swell and push on the brain, possibly causing damage.

IVH increases the risk of another kind of brain injury called **periventricular leukomalacia (PVL)**. This happens when small areas of the brain near the ventricles are damaged. Babies with PVL are at risk for developmental problems.

What treatment will my baby receive?

Your baby will receive treatment to keep him or her stable and to relieve any symptoms that are caused by IVH. Treatment may include supportive care, blood transfusions, and medicines.

Babies with grade 3 or 4 IVH who develop hydrocephalus may need treatment to relieve the pressure in the ventricles. If this is necessary, the health care team will describe the procedure to you.

How is IVH monitored?

IVH is usually monitored using ultrasound scans. If doctors need more information, they may order a more detailed test such as a **CT scan** or **MRI**.

What will happen next?

Each baby is different, but the long-term effects of IVH are related to the location and the amount of bleeding that occurred. Be sure to keep all follow-up appointments after you leave the hospital. Children who had IVH as infants may need to be checked for several years to see if the bleeding harmed the brain. Talk to your baby's health care team. They can answer any questions you have about your baby.

Glossary

Apnea – a brief stop in breathing

Cerebrospinal fluid (CSF) – fluid that surrounds the brain and spinal cord

CT scan – painless test that uses X-rays to create a 3D picture of structures inside the body

Hydrocephalus – extra fluid inside the ventricles

MRI – painless test that produces an image of structures inside the body. MRI machines do not use radiation

Periventricular leukomalacia (PVL) – type of brain damage involving small areas of tissue near the ventricles

Respiratory distress syndrome – a condition that makes it hard for babies to breathe

Ultrasound – painless test that uses sound waves to create a picture of structures inside the body

Ventricles – fluid-filled spaces in the brain

Ask the health care team when you have questions — they are there to help.

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