# Understanding Intraventricular Haemorrhage

## What is intraventricular haemorrhage?

**Intraventricular haemorrhage (IVH)** is when small blood vessels break and bleed into the ventricles (small chambers) inside the brain. The ventricles contain a liquid called **cerebrospinal fluid** that is important for brain function.

## What causes IVH?

IVH occurs when small blood vessels near the ventricles break. IVH is most common in premature babies, especially very low birth weight babies (less than 1500 grams). 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.

## 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 (apnoea)
- Low blood pressure
- Slow heart rate
- Decreased muscle tone and reflexes
- Seizures

## How is IVH diagnosed?

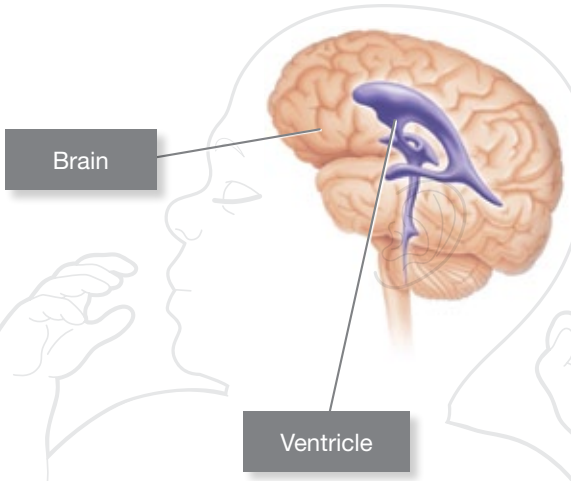
Almost all cases of IVH occur within one week of birth. Very premature babies (born at less than 30-32 weeks gestation) are routinely screened for IVH before they are 14 days old. Premature babies born after 30-32 weeks gestation are usually screened if they have risk factors, such as breathing problems 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 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.

Grade 1 and 2 are the most common (75%) and are rarely associated with any specific problems with later brain function. Grade 3 and 4 may cause later problems with brain function in 30 - 50% of cases.




**Intraventricular haemorrhage**

*With intraventricular haemorrhage (IVH), small blood vessels break and bleed into the ventricles (spaces) inside the brain.*

# Treating Intraventricular Haemorrhage

## 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, or "water on the brain". With 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 healthcare 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 us different, but 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 the healthcare team. They can answer any question you have about your baby.

## Glossary

**Apnoea**
*breathing stops for a short period of time*

**Cerebrospinal fluid**
*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)**
*the 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**
*a painless test that uses sound waves to create a picture of structures inside the body*

**Ventricles**
*fluid-filled spaces in the brain*

Ask the healthcare team when you have questions – they are there to help.

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