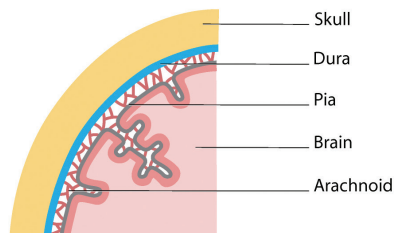


**Neurological deficit** – Following SAH, a number of individuals may be left with a neurological disability. This may affect speech, strength in the arms and legs, conscious level or even personality. These people will require a period of rehabilitation to maximise their recovery.



## Glossary of terms

**Interventional Neuroradiologist:** A doctor who uses image guidance (e.g. X-rays) to perform endovascular (blood vessel) treatments.

**Neuro-critical care:** A critical care unit dedicated to caring for patients with neurological conditions.

**CT scan:** Computerised Tomography uses a series of x-ray beams to produce a 2D image of the brain.

**CT Angiogram:** CTA is a CT scan where a dye is injected into the bloodstream, to produce images of the brain blood vessels.

**Lumbar puncture:** Under local anaesthetic, a needle is inserted into the spinal canal, to confirm an SAH has occurred.

**DSA:** Digitally Subtracted Angiography is a very in-depth study where a fine tube is threaded up into the arteries that supply the brain. A dye is then injected to create a 3D image of the blood vessels of the brain.

**Vasospasm:** A complication of SAH where the blood vessels in the brain constrict, decreasing the blood supply to brain tissue sometimes creating neurological symptoms or a stroke.

**Hydrocephalus:** A build up of fluid inside the water-filled chambers within the brain (ventricles), leading to enlargement of these chambers (hydrocephalus) and a build up of pressure inside the brain. Enlargement of the ventricles can be seen on a CT scan and the pressure inside the head can be measured with a lumbar puncture or an intracranial pressure monitor.

## Useful contact numbers

**Ward 407:** 0121 371 4070 (4th Floor)

**Ward 409:** 0121 371 4090 (4th Floor)

**Ward 411:** 0121 371 4110

**CCU Area C:** 0121 371 2571 (2nd Floor)

**Visiting times:** 11:00–20:00 Mon–Sun



### NEUROSURGICAL DEPARTMENT

**Heritage Building (Queen Elizabeth Hospital)**

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Telephone: 0121 371 2000



**University Hospitals Birmingham**  
NHS Foundation Trust

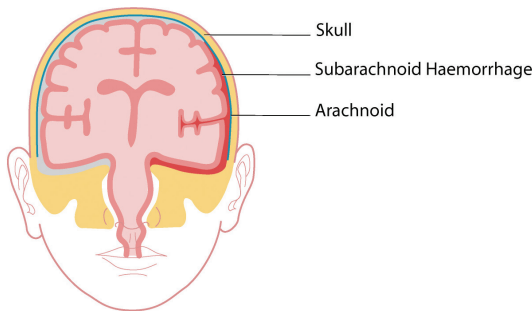


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## What is Subarachnoid Haemorrhage?

Subarachnoid haemorrhage (often abbreviated to SAH) is a bleed into the space between the brain and one of the membranes surrounding the brain, called the arachnoid. This space is normally filled with a watery fluid, known as *cerebro-spinal fluid* (CSF), which surrounds the brain and the spinal cord. When bleeding occurs into this space it causes a very sudden and severe headache, neck stiffness, nausea and other neurological symptoms.



## What are the causes of SAH?

**1. Aneurysm** Due to differences in individual anatomy, some people may develop weak points on blood vessels of the brain. These weak points are known as aneurysms. Aneurysms can bleed suddenly and without warning. They are more likely to form in people who smoke.

**2. Ateriovenous malformation (AVM)** An AVM is a complex malformation, or abnormal “tangle” of blood vessels in the brain which can include aneurysms also. These abnormal structures are weaker than normal blood vessels and, as a result, they can sometimes bleed without warning.

**3. Head injury** is the most common cause of SAH. In such cases it is the head injury as a whole that requires treatment, which is not the subject of this leaflet.

**4. Idiopathic** Sometimes, even after full investigation, we cannot find the cause of a SAH. Bleeds of this type are unlikely to recur in future.

## Why have I been transferred to the Queen Elizabeth Hospital?

The Queen Elizabeth Hospital Birmingham (QEHB) is the regional centre for neurosurgery—surgery of the brain and spine. This means that we have access to specialist services and facilities that local hospitals do not have. Patients with a SAH will commonly need to spend some time on the Neuro Critical Care Unit.

## What further investigations are required?

More head scans may be needed, including a CT angiogram (CTA) which shows the blood vessels inside the head. Thereafter a digitally subtracted angiogram (DSA) is likely to be carried out, to display the blood vessels in more detail. These investigations help identify the source of the haemorrhage and help plan how we should treat it.

## How SAH patients are treated

**1. Bed rest and observation** – Following a SAH bed rest and a period of observation are required. The patient may be asked to take in a minimum of 3 litres of fluid per day to help maintain good blood flow through the brain.

**2. Medication** – Patients are usually started on a medication called “nimodipine”. This helps to reduce incidence of vasospasm (see “complications” below) following SAH.

**3. Interventional Radiology** – Most patients are treated by a neuro-interventional radiologist.

These specialist doctors insert tiny platinum coils or other devices, into abnormal blood vessels or aneurysms, to stop them bleeding again to and restore blood flow to brain tissue.

**4. Surgery** – At times an open surgical procedure (craniotomy) is required when either a small clip is placed on the weak part of the vessel or the vascular abnormality is removed all together.

## What is the long term outcome of SAH?

Subarachnoid haemorrhage is a serious condition and can be life-threatening if not treated promptly. Even if a source of bleeding is found it may take several months for somebody to recover fully. Even patients who are doing very well can suffer from a degree of physical/mental disability and may require a period of rehabilitation (see below).

## Complications

**Vasospasm** – Sometimes after SAH the blood vessels in the brain react by narrowing, potentially creating stroke-like symptoms or lead to a stroke. This may be an emergency that requires admission to the Critical Care Unit.

**Re-bleed** – SAH caused by an aneurysm may be followed by further bleeds, sometimes within days of the first bleed. This is why people with SAH are treated as soon as possible.

**Hydrocephalus** – Blood shed into the head can sometimes cause blockage to the flow of cerebrospinal fluid, normally clear in appearance that we all have inside our brains and spinal canal. Hydrocephalus can cause headaches and drowsiness. Sometimes a small supplementary operation may be needed to treat hydrocephalus.