

Subarachnoid Hemorrhage (SAH)

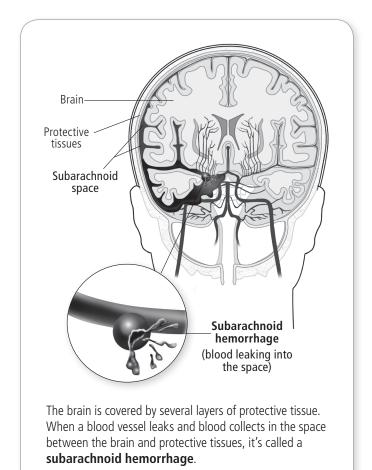
What is it?

A **subarachnoid hemorrhage** happens when blood vessels rupture (break) and cause blood to leak on the surface of the brain. Blood builds up in the **subarachnoid space** — the space between the brain and the thin tissues that cover it.

What are the symptoms?

A subarachnoid hemorrhage puts pressure on the brain, irritates the tissues that cover the brain, and can also deprive the brain of blood. For this reason, **SAH may be a life-threatening condition**. The symptoms of SAH include:

- **Severe headache.** The first symptom is often a fierce, sudden headache like no other headache you've ever had. Phrases used to describe the pain include "worst headache of my life" and "thunderclap headache."
- Other symptoms. These include:
 - Loss of consciousness
 - Nausea or vomiting
 - Mood changes, such as suddenly feeling confused or irritable
 - **Trouble moving** or loss of movement or feeling
 - Stiff neck, which may appear suddenly
 - Seizures
 - Light sensitivity (light bothers or hurts your eyes)
 - Vision/eye problems, including blurry or double vision, blind spots, or temporary vision loss in one eye. Eyelids may also droop or pupils may appear to be different sizes.



What causes it?

The causes of SAH include:

- Bleeding from a **cerebral aneurysm**, a weak area or bulge in a blood vessel near the brain
- Bleeding from an abnormal tangle of tiny blood vessels called an arteriovenous malformation (AVM)
- A head injury
- Bleeding disorders

Sometimes a clear cause of a subarachnoid hemorrhage can't be identified — in these cases, it is called **idiopathic**.

How is it diagnosed?

To diagnose a subarachnoid hemorrhage, the doctor will examine you and run various tests.

- **In the exam,** the doctor will check for a stiff neck, signs of decreased nerve and brain function, and eye problems.
- A head CT scan will be used to look for areas of bleeding. A CT scan is a test that uses x-rays to create many cross-sectional pictures of your skull and brain. (The CT scan may appear to be normal if there has been only a small area of bleeding.)
- If the CT scan is normal but SAH is still suspected, you may have a **lumbar puncture** (spinal tap) to check for blood in your spinal fluid.
- Other tests include:
 - CT scan angiogram. This test is a CT scan that uses contrast dye and x-rays to check your blood vessels. This test helps the doctor check for an aneurysm.
 - Cerebral angiogram. This test involves inserting a catheter (tiny tube) into a blood vessel and threading it up to an artery in your neck. The catheter is used to inject contrast dye, and x-rays record how the dye passes through the blood vessels of the brain. This test can provide more detail than a CT scan.
 - Magnetic resonance imaging (MRI) or magnetic resonance angiogram (MRA). These tests involve powerful magnets and radio waves to create detailed images.

How is it treated?

Treatment depends on what caused your SAH and the amount of bleeding. Treatment of the SAH focuses on:

- Managing symptoms and preventing complications
- Treating the cause of bleeding
- Helping you recover

Managing symptoms and preventing complications

Treatment varies, and will focus on the primary symptoms caused by SAH. Treatments can include:

- Treatment for coma or decreased alertness.

 This may include life support procedures such as a breathing tube.
- **Pain medication**. To treat the headache and pressure, you will be given pain medication and sometimes anti-anxiety medication.
- Testing for blood vessel spasms. You might have a test called a transcranial doppler ultrasound to check for blood vessel spasms (blood vessels tightening) as a result of the SAH. This test involves ultrasound (high-frequency sound waves) that are sent through your skull by a hand-held device or headset. As the sound waves bounce off the blood vessels, information is sent to a computer screen. This test may also be used to guide treatment.
- Other medications. You will also receive other medications, often through an IV in your wrist or arm. These may include:
 - Medication to control your blood pressure
 - Medication to treat or prevent blood vessel spasms
 - Medication to prevent or treat seizures
- Procedures to reduce pressure and irritation in the brain. You may have surgery to remove a hematoma (a collection of blood), clear away dead tissue, or temporarily remove part of your skull. If fluid builds up inside the brain because of bleeding, your doctor may need to do a ventriculostomy. This is a surgery to place a small, soft tube into your skull. The tube stays in until the extra fluid has drained.
- Precautions against further pressure on your brain. You may need to avoid anything that increases pressure inside the head, such as sudden changes in position, bending over, or straining. You may need to take laxatives to prevent you from straining during bowel movements.

Rest and observation. You may need to stay in the
hospital for several days or even weeks. Further bleeding
or blood vessel spasms can happen soon after the initial
SAH, so healthcare providers will monitor you closely
and continue treatment.

Treating the cause

Often the bleeding is caused by a condition that must be treated.

- If the cause was an aneurysm, you may have:
 - Surgery to clip the aneurysm.
 The surgeon opens a small hole in the skull and places a small clip on the blood vessel "upstream" from the aneurysm. This can help prevent re-bleeding or rupture of the aneurysm.
 - Coil embolization (coiling).
 In this procedure, a doctor pushes a tiny platinum coil through a tube (catheter) placed inside your blood vessel. The catheter and coil are threaded up through the blood vessel toward the trouble spot. Once there, the coil opens up to fill the vessel, causing it to clot and seal itself off from connecting blood vessels.



- If the cause was an AVM, you may have:
 - A **coiling** procedure (see above)
 - Surgery to remove the AVM if it isn't too large or too deep inside the brain. Removing the AVM can lower the chance of future bleeding.
 - Stereotactic radiosurgery, a procedure that uses
 3-dimensional X-ray guidance to focus a radiation beam on the the tangled vessels. The radiation causes the vessels to clot and seal themselves off. Without a blood supply, the AVM eventually disappears.

Helping you recover

You will have treatment to help you recover from complications caused by the SAH. For example, an SAH can cause a stroke or symptoms very similar to those of a stroke. In this case, you will begin **stroke rehab**. Stroke rehab is a general name for a variety of therapies and services that can help your brain learn new ways of working and help you regain more of the abilities you lost during the stroke.

For more information on stroke recovery, see Intermountain's handbook *Recovering from a Stroke*.

What can I expect afterward?

Your long-term outlook depends on the location and amount of bleeding during the SAH, as well as any complications that occurred. Here are several things you might expect:

- Continued stroke rehab if you lost brain function during the SAH.
- Continued medication to prevent future complications. After going home, you will probably continue to take medication long-term. For example, you might take medications to control your blood pressure or prevent blood vessel spasms.
- Monitoring yourself for warning signs. There's a chance that a subarachnoid hemorrhage can bleed again, so it's important to watch for:
 - A sudden, intense headache
 - Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body
 - Sudden vision problems, confusion, trouble speaking or understanding
 - Sudden trouble walking, dizziness, or loss of balance or coordination

If you have any of these symptoms, call 911 immediately. Note the exact time the symptoms started and give this time to the paramedics or hospital staff.

Are some people more at risk for SAH?

Subarachnoid hemorrhage can occur at any age, and is slightly more common in women than in men. The following factors can increase your risk for SAH:

- Smoking
- High blood pressure
- Aneurysms in other blood vessels anywhere in your body
- A strong family history of aneurysms
- Connective tissue disorders that weaken blood vessels, such as fibromuscular dysplasia (FMD)
- History of polycystic kidney disease

How can I reduce my risk?

You can help reduce your risk of a future SAH by following these guidelines:

- If you smoke, quit. This is the single biggest difference you can make in your health.

 Intermountain's booklet *Quitting Tobacco:*Your Journey to Freedom has information and encouragement. And help is available. Call 1-888-567-TRUTH for the Utah Tobacco Quit Line, or go to www.utah.quitnet.com.
- Control your blood pressure. Have your blood pressure checked frequently. If your doctor prescribes blood pressure medication, continue to take it even if you feel fine.

When to seek medical help

Call your doctor if you experience any of these:

- Side effects from your medication ask your doctor what to watch for
- Frequent headaches ("normal" headaches, not the sudden, severe headache of SAH)
- Fatigue (extreme tiredness) this can be common after a brain injury

Call 911 immediately and make a note of the time if you experience any of these symptoms:

- A sudden, intense headache similar to the headache you had with the first SAH
- Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body
- Sudden vision problems, confusion, trouble speaking or understanding
- Sudden trouble walking, dizziness, or loss of balance or coordination