

Stroke: What is it?

Every year, more than 750,000 people have a stroke. A stroke is a “brain attack” caused by a lack of blood flow to the brain.

Blood is carried from the heart to the brain in arteries or blood vessels. The brain needs a constant supply of blood. Blood flows easily through a normal, clear artery.

When one of the arteries to the brain is either blocked or bursts, the brain does not get the blood it needs to function and brain cells die. There are many things that can affect blood flow. One of these is atherosclerosis.

Atherosclerosis is a narrowing and hardening of the arteries. It is caused by a build-up of plaque around the walls of the arteries. If enough plaque builds up, there is less room for blood to flow through. Over time, the build-up can reduce or completely block blood flow through the arteries. Atherosclerosis can occur in most major arteries.

What are the symptoms of stroke?

Symptoms include:

- **Sudden numbness or weakness of face, arm or leg, especially on one side of the body**
- **Sudden confusion, trouble speaking or understanding**
- **Sudden trouble seeing in one or both eyes**
- **Sudden trouble walking, dizziness, loss of balance or coordination**
- **Sudden severe headache with no known cause**

If symptoms go away within 24 hours, then you’ve had a transient ischemic attack (TIA) or ministroke. Unlike strokes, TIAs usually do not result in permanent brain damage. However, TIAs should never be ignored! More than one third of people who have TIAs will go on to have a stroke.

What is intracranial atherosclerosis?

Intracranial simply means “inside the skull.” Atherosclerosis is a hardening of the arteries. So, intracranial atherosclerosis is a narrowing and hardening of the arteries in the skull.

Generally there are no symptoms until the arteries are so clogged with plaque that blood can no longer flow through them. In fact, most people find out they have this problem only after they have already had a stroke.

Who has it?

Because there are no symptoms, we don’t really know how many people have some degree of atherosclerosis in their brain arteries. What we do know is that about 70,000 people in the U.S. each year have a stroke caused by narrowed arteries in the skull – about 8-10% of all ischemic or clot-caused strokes.

Am I at risk?

Your risk for intracranial atherosclerosis increases if:

- You smoke
- You have high cholesterol
- You have diabetes
- You have high blood pressure
- You are overweight
- You have a family member who has had stroke or heart disease
- You have already had a stroke and had a high degree of plaque build-up in the brain
- You are African American, Hispanic or Asian

How do you diagnose it?

Your doctor may be able to diagnose intracranial atherosclerosis by looking at the blood flow in your brain. A variety of tests can do this. Some take pictures of your blood vessels using a type of X-ray. With these tests, a doctor can see if the arteries are diseased, narrowed, enlarged, or blocked altogether. Other tests use sound waves to study your blood flow. Each test is quick and painless. They are ordered by your doctor and performed by a trained examiner or radiologist.

What is the treatment?

Atherosclerosis in the brain is discovered only after there is a complication – usually after you have had a stroke. And if you’ve already had a stroke or TIA (ministroke), you are up to 10 times more likely to have another one.

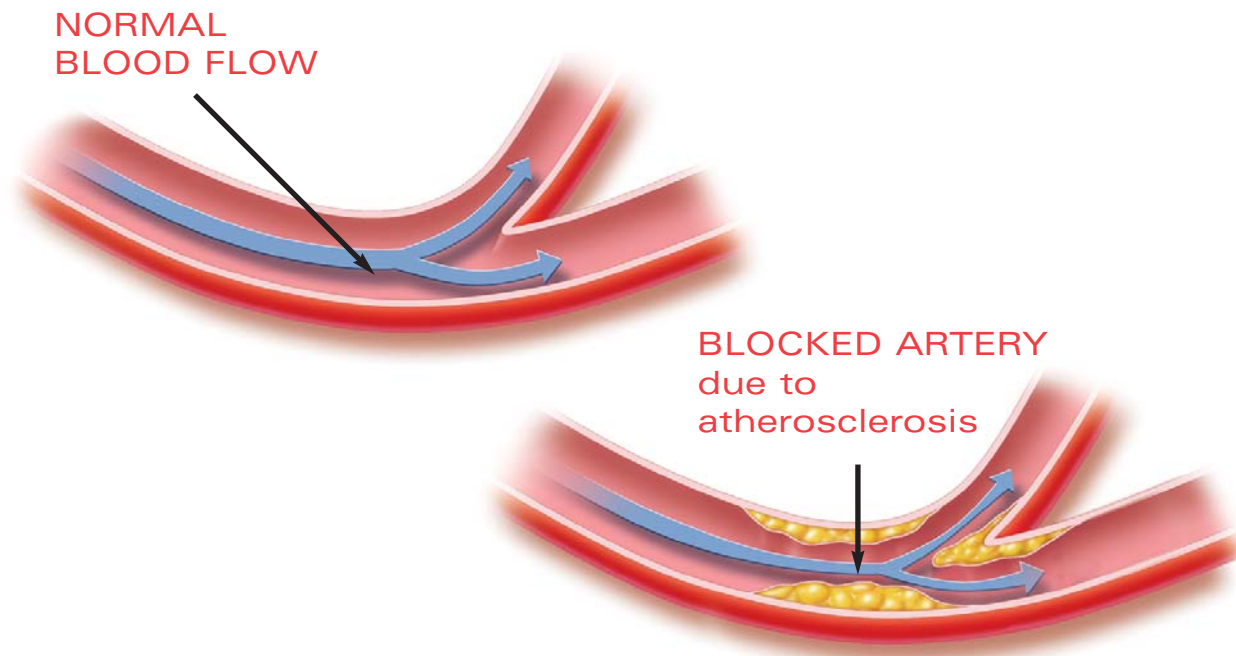
So, one thing your doctor will do is help you prevent a second stroke. This can often be done by changing the way you live. Lifestyle changes can also slow down the development of atherosclerosis.

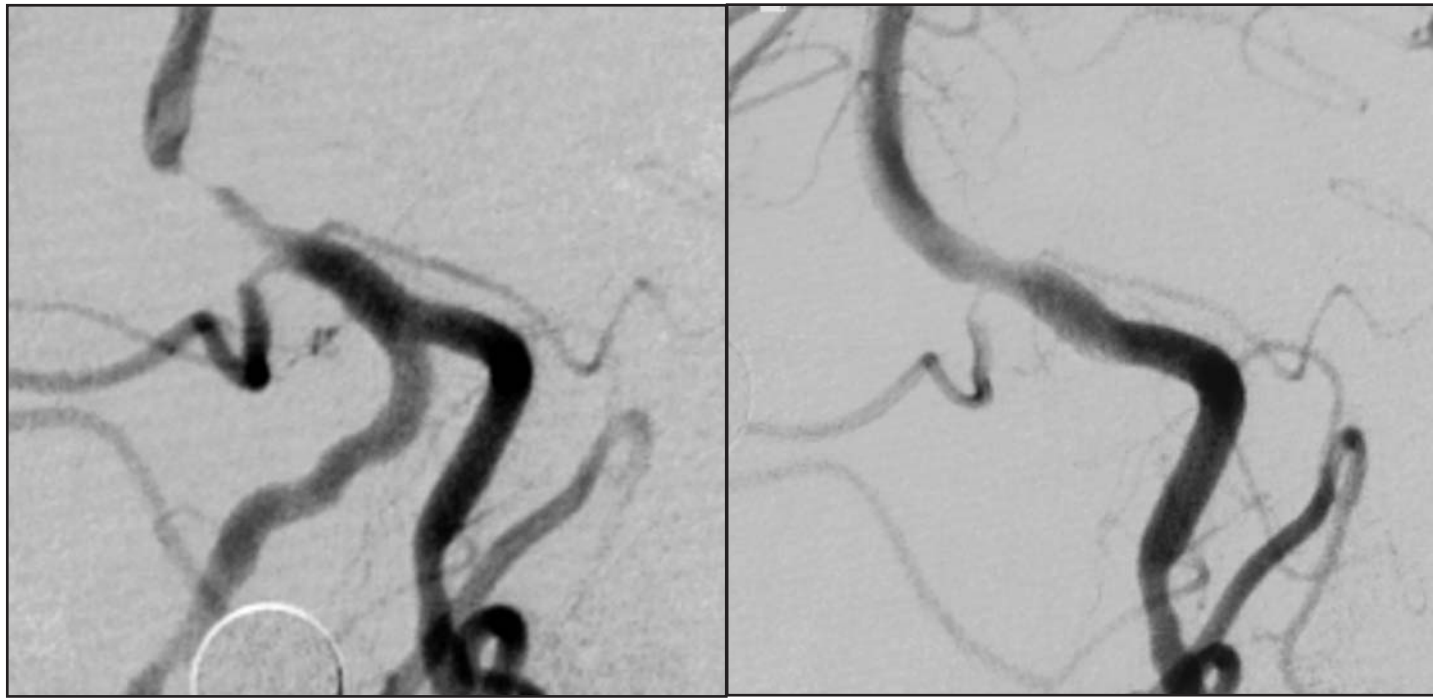
Recommended lifestyle changes include:

- a low-fat, low-cholesterol diet
- losing weight (if necessary)
- exercise
- controlling blood pressure
- not smoking

Your doctor may also suggest that you take medicines to prevent TIAs and stroke. These medicines may include:

- blood pressure lowering drugs if your blood pressure is high
- antiplatelet drugs (aspirin, dipyridamole (Aggrenox[®]) or clopidogrel (Plavix[®])) which help keep blood platelets from sticking together to form a clot
- anticoagulant (blood thinning) drugs such as warfarin (Coumadin[™]) to prevent clots forming





An angiogram of a brain artery before and after stenting. Notice how the blood flow was completely blocked before stenting but has been restored after.

Courtesy of Professor M. Hartmann, Division of Neurology, Heidelberg Medical School, Germany

- cholesterol-lowering drugs if your bad cholesterol level is high (LDL >100)

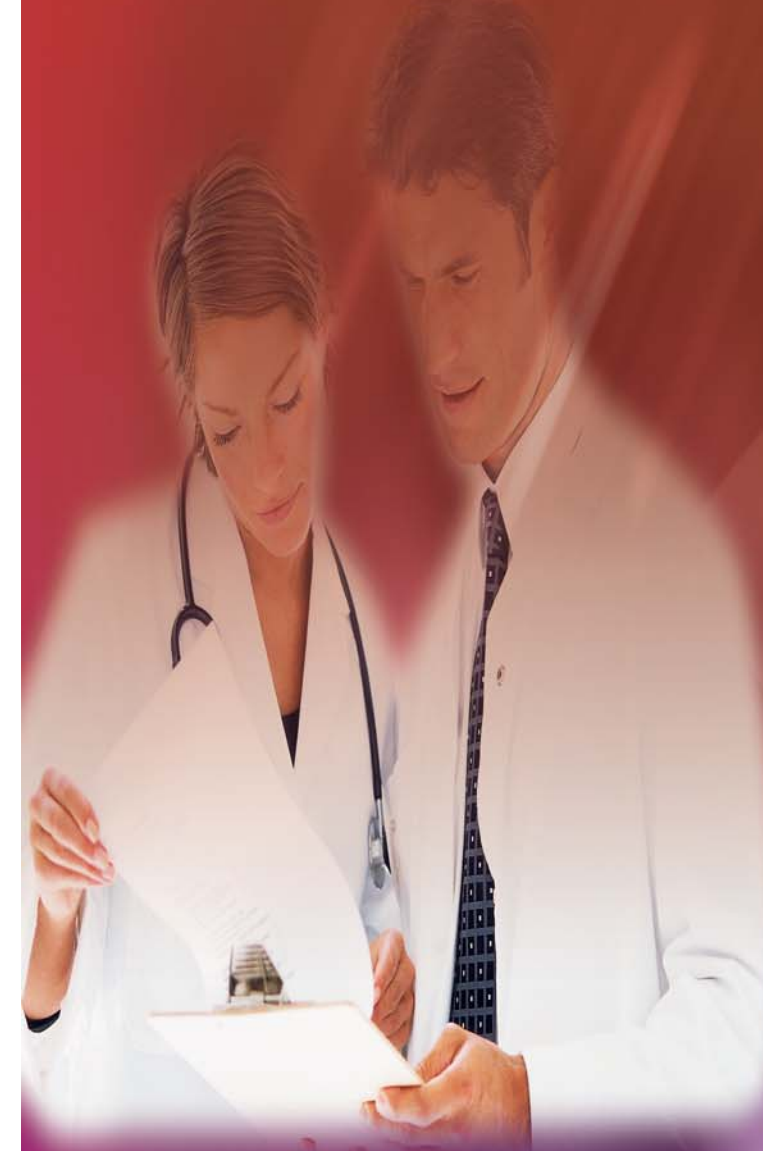
If your arteries are greatly blocked, your doctor may suggest either angioplasty and/or stenting to open them up. For both procedures, a thin tube called a catheter is inserted in the groin or thigh area. From there it is threaded up through your body to the site of the diseased artery. A dye is injected into your arteries so that the doctor is able to see the blockage on an X-ray machine.

If angioplasty is performed, a small balloon at the end of the catheter is inflated at the blocked area. The balloon pushes against the built-up plaque and compresses (flattens) it. At the same time it also widens the blood vessel. As a result, the blocked artery opens up and blood flow is restored. If stenting is performed, a small stent (a wire mesh tube) at the end of the catheter is

placed in the artery. The stent expands to fit the size and shape of the artery wall. It is designed to open the artery and prevent future blockages.

Though both procedures usually require a hospital stay of one or two days, they are not considered surgery. These procedures are typically performed by a neuroradiologist or a neurosurgeon.

For stroke survivors who do not respond to current treatments such as aspirin or blood-thinning drugs, angioplasty with stenting is an option. Currently, the Wingspan™ Stent System is the only treatment approved by the Federal Drug Administration for treating intracranial atherosclerotic disease. For more information, ask your doctor or visit Boston Scientific's website at www.bostonscientific.com.



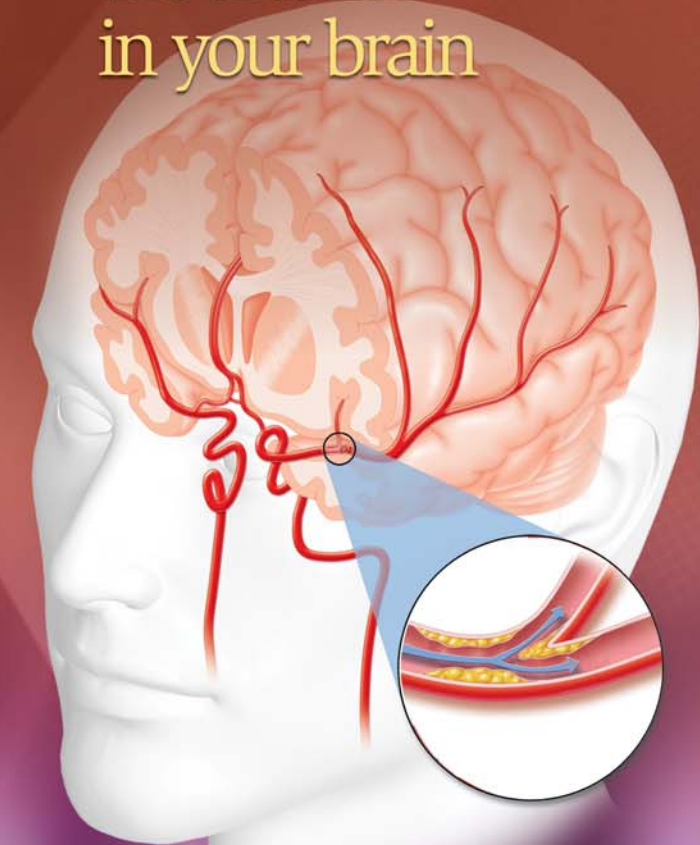
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Hardening of
the arteries
in your brain



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