

# Stroke

## DEFINITION

A stroke occurs when the blood supply to part of your brain is interrupted or severely reduced, depriving brain tissue of oxygen and food. Within minutes, brain cells begin to die.

A stroke is a medical emergency. Prompt treatment is crucial. Early action can minimize brain damage and potential complications.

The good news is that strokes can be treated and prevented, and many fewer Americans die of stroke now than even 15 years ago. Better control of major stroke risk factors — high blood pressure, smoking and high cholesterol — may be responsible for the decline.

(Source: Reprinted from the MayoClinic.com article "Stroke: Definition" <http://www.mayoclinic.com/health/stroke/DS00150>)

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## SYMPTOMS

Watch for these signs and symptoms if you think you or someone else may be having a stroke. Note when your signs and symptoms begin, because the length of time they have been present may guide your treatment decisions.

- **Trouble with walking.** You may stumble or experience sudden dizziness, loss of balance or loss of coordination.
- **Trouble with speaking and understanding.** You may experience confusion. You may slur your words or have difficulty understanding speech.
- **Paralysis or numbness of the face, arm or leg.** You may develop sudden numbness, weakness or paralysis in your face, arm or leg, especially on one side of your body. Try to raise both your arms over your head at the same time. If one arm begins to fall, you may be having a stroke. Similarly, one side of your mouth may droop when you try to smile.
- **Trouble with seeing in one or both eyes.** You may suddenly have blurred or blackened vision in one or both eyes, or you may see double.
- **Headache.** A sudden, severe headache, which may be accompanied by vomiting, dizziness or altered consciousness, may indicate you're having a stroke.

### **When to see a doctor**

Seek immediate medical attention if you notice any signs or symptoms of a stroke, even if they seem to fluctuate or disappear. Call 911 or your local emergency number right away. Every minute counts. Don't wait to see if symptoms go away. The longer a stroke goes untreated, the greater the potential for brain damage and disability. To maximize the effectiveness of evaluation and treatment, you'll need to be treated at a hospital within three hours after your first symptoms appeared. If you're with someone you suspect is having a stroke, watch the person carefully while waiting for emergency assistance.

(Source: Reprinted from the MayoClinic.com article "Stroke: Symptoms" <http://www.mayoclinic.com/health/stroke/DS00150/DSECTION=symptoms>)

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# Stroke

## CAUSES

A stroke occurs when the blood supply to your brain is interrupted or reduced. This deprives your brain of oxygen and nutrients, which can cause your brain cells to die. A stroke may be caused by a blocked artery (ischemic stroke) or a leaking or burst blood vessel (hemorrhagic stroke). Some people may experience a temporary disruption of blood flow through their brain (transient ischemic attack).

### **Ischemic stroke**

About 85 percent of strokes are ischemic strokes. Ischemic strokes occur when the arteries to your brain become narrowed or blocked, causing severely reduced blood flow (ischemia). The most common ischemic strokes include:

- **Thrombotic stroke.** A thrombotic stroke occurs when a blood clot (thrombus) forms in one of the arteries that supply blood to your brain. A clot often may be caused by fatty deposits (plaque) that build up in arteries and cause reduced blood flow (atherosclerosis) or other artery conditions.
- **Embolic stroke.** An embolic stroke occurs when a blood clot or other debris forms away from your brain — commonly in your heart — and is swept through your bloodstream to lodge in narrower brain arteries. This type of blood clot is called an embolus.

### **Hemorrhagic stroke**

Hemorrhagic stroke occurs when a blood vessel in your brain leaks or ruptures. Brain hemorrhages can result from many conditions that affect your blood vessels, including uncontrolled high blood pressure (hypertension) and weak spots in your blood vessel walls (aneurysms). A less common cause of hemorrhage is the rupture of an arteriovenous malformation (AVM) — an abnormal tangle of thin-walled blood vessels, present at birth. The types of hemorrhagic stroke include:

- **Intracerebral hemorrhage.** In an intracerebral hemorrhage, a blood vessel in the brain bursts and spills into the surrounding brain tissue, damaging brain cells. Brain cells beyond the leak are deprived of blood and damaged. High blood pressure, trauma, vascular malformations, use of blood-thinning medications and other conditions may cause intracerebral hemorrhage.
- **Subarachnoid hemorrhage.** In a subarachnoid hemorrhage, an artery on or near the surface of your brain bursts and spills into the space between the surface of your brain and your skull. This bleeding is often signaled by a sudden, severe headache. A subarachnoid hemorrhage is commonly caused by the rupture of an aneurysm, a small sack-shaped or berry-shaped outpouching on an artery in the brain. After the hemorrhage, the blood vessels in your brain may widen and narrow erratically (vasospasm), causing brain cell damage by further limiting blood flow to parts of your brain.

### **Transient ischemic attack (TIA)**

A transient ischemic attack (TIA) — also called a ministroke — is a brief episode of symptoms similar to those you'd have in a stroke. A transient ischemic attack is caused by a temporary decrease in blood supply to part of your brain. TIAs often last less than five minutes.

# Stroke

Like an ischemic stroke, a TIA occurs when a clot or debris blocks blood flow to part of your brain. A TIA doesn't leave lasting symptoms because the blockage is temporary.

Seek emergency care even if your symptoms seem to clear up. If you've had a TIA, it means there's likely a partially blocked or narrowed artery leading to your brain, putting you at a greater risk of a full-blown stroke that could cause permanent damage later. It's not possible to tell if you're having a stroke or a TIA based only on your symptoms. Up to half of people whose symptoms appear to go away actually have had a stroke causing brain damage.

(Source: Reprinted from the MayoClinic.com article "Stroke: Causes"  
<http://www.mayoclinic.com/health/stroke/DS00150/DSECTION=causes>)

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## **RISK FACTORS**

Many factors can increase your risk of a stroke. A number of these factors can also increase your chances of having a heart attack. Stroke risk factors include:

### **Potentially treatable risk factors**

- High blood pressure — risk of stroke begins to increase at blood pressure readings higher than 120/80 millimeters of mercury (mm Hg). Your doctor will help you decide on a target blood pressure based on your age, whether you have diabetes and other factors.
- Cigarette smoking or exposure to secondhand smoke.
- High cholesterol — a total cholesterol level above 200 milligrams per deciliter (mg/dL), or 5.2 millimoles per liter (mmol/L).
- Diabetes.
- Being overweight or obese.
- Physical inactivity.
- Obstructive sleep apnea (a sleep disorder in which the oxygen level intermittently drops during the night).
- Cardiovascular disease, including heart failure, heart defects, heart infection or abnormal heart rhythm.
- Use of some birth control pills or hormone therapies that include estrogen.
- Heavy or binge drinking.
- Use of illicit drugs such as cocaine and methamphetamines.

### **Other risk factors**

- Personal or family history of stroke, heart attack or TIA.
- Being age 55 or older.
- Race — African-Americans have higher risk of stroke than people of other races.
- Gender — Men have a higher risk of stroke than women. Women are usually older when they have strokes, and they are more likely to die of strokes than men.

(Source: Reprinted from the MayoClinic.com article "Stroke: Risk factors"  
<http://www.mayoclinic.com/health/stroke/DS00150/DSECTION=risk-factors>)

# Stroke

## COMPLICATIONS

A stroke can sometimes cause temporary or permanent disabilities, depending on how long the brain suffers a lack of blood flow and which part was affected. Complications may include:

- **Paralysis or loss of muscle movement.** Sometimes a lack of blood flow to the brain can cause you to become paralyzed on one side of your body, or lose control of certain muscles, such as those on one side of your face or one arm. This can cause difficulty with several daily activities, including walking, eating and dressing. With physical therapy, you may see improvement in muscle movement or paralysis.
- **Difficulty talking or swallowing.** A stroke may cause you to have less control over the way the muscles in your mouth and throat move, making it difficult for you to talk, swallow or eat. For example, some people may experience slurred speech (dysarthria), due to incoordination of muscles in your mouth. You also may have difficulty with language (aphasia), including speaking or understanding speech, reading or writing. Therapy with a speech and language pathologist may help you improve your skills.
- **Memory loss or thinking difficulties.** Many people who have had strokes experience some memory loss. Others may have difficulty thinking, making judgments, reasoning and understanding concepts. These complications may improve with rehabilitation therapies.
- **Emotional problems.** People who have had strokes may have more difficulty controlling their emotions, or they may develop depression.
- **Pain.** Some people who have had strokes may have pain, numbness or other strange sensations in parts of their bodies affected by stroke. For example, if a stroke causes you to lose feeling in your left arm, you may develop an uncomfortable tingling sensation in that arm. Some people may be sensitive to temperature changes, especially extreme cold. This is called central stroke pain or central pain syndrome (CPS). This complication generally develops several weeks after a stroke, and it may improve over time. But because the pain is caused by a problem in your brain, instead of a physical injury, few medications may treat CPS.
- **Changes in behavior and self-care.** People who have had strokes may become more withdrawn and less social or more impulsive. They may lose the ability to care for themselves and may need a caretaker to help them with their grooming needs and daily chores.

As with any brain injury, the success of treating these complications will vary from person to person.

(Source: Reprinted from the MayoClinic.com article "Stroke: Complications"  
<http://www.mayoclinic.com/health/stroke/DS00150/DSECTION=complications>)