

Stroke

If you are having a stroke, you need to be taken to the hospital right away. Thankfully, there are stroke treatments that can increase your chances of walking away from an attack with few or no disabilities. But you have to get these treatments within 3 hours from the start of your symptoms for them to work. Be aware of the signs of stroke so you can help yourself or someone else get vital treatment.

What is a stroke?

A stroke occurs when part of your brain doesn't get the blood that it needs. A stroke is sometimes called a "brain attack." This is because, like a heart attack, a stroke involves the loss of blood flow, leading to the death of cells. In fact, without blood, your brain cells start to die within minutes.

There are two types of stroke:

- **Ischemic (ih-SKEE-mik) stroke**—
When a blood vessel bringing blood to the brain becomes blocked. For instance, a blood clot may form within

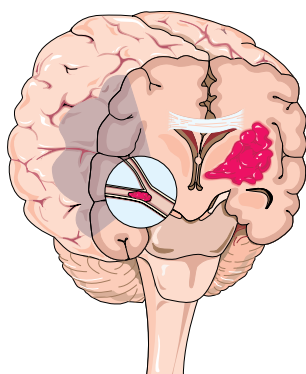
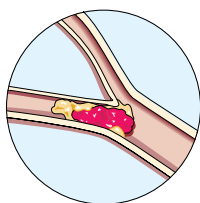


What are the symptoms of a stroke?

A stroke happens fast. The most common signs of a stroke are sudden:

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

If you have any of these symptoms or see anyone with these symptoms, call 911 right away. Every minute counts!



ISCHEMIC STROKE

the heart or an artery in the neck. The clot is carried by the blood to the brain, where it gets stuck in a smaller artery. There, it cuts off blood flow to a part of the brain. About 80 percent of strokes are ischemic strokes.

- **Hemorrhagic (hem-ur-RAJ-ihk) stroke**—When a blood vessel in or on the surface of the brain breaks open. As a result, blood flows into the wrong areas. This blood, which would normally supply brain cells with oxygen and nutrients, can no longer get to these cells. Also, this blood in the wrong areas puts pressure on nearby brain cells. For both of these reasons, brain cells die. In an intracerebral (ihn-truh-suh-REE-bruhl) hemorrhage, the blood flows into the brain itself. In a subarachnoid (suhb-uh-RAK-noid) hemorrhage, the blood flows into a thin space outside the brain but still inside the skull. About 20 percent of strokes are hemorrhagic strokes.

If you're having a stroke, you may not be able to call 911. In fact, you may not even be able to move or talk! In most stroke cases, it's a family member, coworker, or other bystander who calls 911. That's why everyone should become familiar with the signs of a stroke.

What is a “mini-stroke”?

If you have signs of a stroke that don't last long, you've had what is called a transient ischemic attack (TIA), or “mini-stroke.” TIAs typically last from 5 to 15 minutes, with no lasting symptoms. They are often caused by a blood clot getting stuck in a brain artery for a short time but then breaking up, allowing the blood to flow freely again. If your symptoms last longer than 24 hours, then you've had a major stroke rather than a TIA.

If you're having stroke symptoms, there's no way of knowing whether you're having a TIA or a major stroke. You should still call 911 as soon as possible.

Even a “mini-stroke” is considered a stroke and needs treatment. A TIA is often a sign that you may have a major stroke in the near future—perhaps in the next few days. Your doctor may prescribe medicines or surgery that may help you





avoid having a major stroke that could cause lasting damage.

Your doctor may give you aspirin or some other drug to reduce blood clotting. Your doctor may also recommend a type of surgery called carotid endarterectomy (kuh-ROT-ihd en-dar-tuh-REK-tuh-mee). In this procedure, the carotid artery in the neck is opened up and plaque is removed from the artery walls. This allows the blood to flow more freely in the artery and reduces the chances of a clot forming.

Another way to open a clogged carotid artery is to insert a stent. A stent is a tiny, slender metal-mesh tube that can be expanded to keep an artery open. A stent placed in a carotid artery is very similar to a stent placed in an artery in the heart for treating coronary artery disease. (See page 31 of the *Heart Disease* chapter for more information on stents.)

Who is at risk of having a stroke?

Although anyone can have a stroke, some people are at higher risk than others. You have no control over some risk factors for stroke, such as your age or sex. But there are many risk factors that you can change or control, such as high blood pressure or cigarette smoking.

Stroke and heart disease share many of the same risk factors. The good news is that 80 percent of strokes can be prevented by changing or controlling certain risk factors.

Stroke risk factors that you cannot change

Previous stroke. Having had a previous stroke is the biggest risk factor for having another stroke.

Age. For every decade after the age of 55, your stroke risk doubles.

Sex. If you consider all ages, men are more likely to have strokes than women. But between the ages of 45 and 64, women are more likely to have strokes than men. This is probably because blood pressure and cholesterol (koh-LESS-tur-ol) levels rise more quickly in women than men during this period. High blood pressure and poor cholesterol levels are both risk factors for stroke.

Menopause. The risk of stroke increases after menopause.

Race. African Americans are more likely to have a stroke than other people. This is partly because African Americans are more likely to have certain risk factors, such as high blood pressure and diabetes.

Stroke family history. If stroke runs in your family, it may be because your

family carries genes that increase your chances of having a stroke. An example would be genes that increase your chances of forming a blood clot. Or it may be that your family has a lifestyle that increases your chances of having a stroke. For example, your family may eat a diet high in saturated fat.

Stroke risk factors that you can change

High blood pressure. High blood pressure is the biggest risk factor for stroke. In fact, it increases your chances of having a stroke 4 to 6 times.

For information on risk factors for heart disease, see the *Heart Disease* chapter on page 15.

Heart disease. The second biggest risk factor for stroke is heart disease, especially a disease called atrial fibrillation (fib-ruh-LAY-shuhn). In atrial fibrillation, the upper chambers of the heart beat faster and more irregularly than the rest of the heart. As a result, blood doesn't flow



through these chambers correctly and can clot. A clot may then dislodge and travel up to the brain, where it can cause an ischemic stroke.

Blood cholesterol levels. High LDL (bad) cholesterol and low HDL (good) cholesterol levels increase your risk of stroke. They do this by causing the build-up of plaque.

Plaque and Atherosclerosis

Plaque is a fatty substance that builds up in the walls of arteries. Plaque is made up largely of cholesterol and fat. The narrowing and hardening of arteries caused by plaque buildup is called atherosclerosis (a-thuh-roh-skluh-ROH-suhss).

Cigarette smoking. Cigarette smoking has been linked to plaque buildup in the carotid artery. Other ways that cigarette smoking increases your stroke risk include:

- The nicotine in cigarettes raises blood pressure.
- Carbon monoxide from smoking reduces the amount of oxygen your blood can carry to the brain.
- Cigarette smoke makes your blood thicker and more likely to clot.

Your doctor can recommend programs and medications that may help you quit smoking.

Obesity. Postmenopausal women with a waist size larger than 35 inches and a high triglyceride (treye-GLIH-suh-ryd), or blood fat, level have 5 times the risk of having a stroke.

Diabetes. Diabetes is a disease in which the blood glucose, or sugar, level becomes too high. Diabetes damages blood vessels throughout the body, including the brain. As a result, diabetes triples the risk of stroke. If the blood glucose level is high at the time of a stroke, brain damage is usually more severe than if the level is normal. Treating diabetes can delay the onset of blood vessel changes that increase stroke risk.

For information on treating diabetes, see the *Type 2 Diabetes* chapter on page 69.

Heavy alcohol use, illegal drug use. For women, more than one alcoholic drink per day raises stroke risk. Cocaine use is a common cause of hemorrhagic stroke in young people. Long-term marijuana smoking may also be a risk factor for stroke.

Pregnancy. On rare occasions, pregnancy can cause stroke, especially in the first few months after delivery. Pregnancy increases blood pressure, and clots are more easily formed.

Birth control pills or patch. Taking birth control pills or using the birth control patch is generally safe for young, healthy women. With the pill, stroke risk is greater for women who also smoke cigarettes or who have migraines with aura (extreme headaches with a visual disturbance).

With the patch, the stroke risk is greater for women who also smoke cigarettes. Research has not yet shown whether women who have migraines with aura



also have an increased risk of stroke when using the patch. If you get this type of headache, tell your doctor when discussing your birth control options.

For an important warning on birth control pills and the patch and stroke and heart attack risks, see page 164 of the *Reproductive Health* chapter. For information on migraine headaches, see page 357 of the *Pain* chapter.

Menopausal hormone therapy.

Menopausal hormone therapy can increase stroke risk. If you use menopausal hormone therapy, you should take it at the lowest possible dose and for the shortest amount of time. Work with your doctor to come up with a plan that works best for you.

For information on menopausal hormone therapy and the risks of stroke and heart attack, see page 28 of the *Heart Disease* chapter.

Brain aneurysm. An aneurysm (AN-yuh-riz-uhm) is a bulge that forms at a weak spot in an artery wall. Because most brain aneurysms look like a berry hanging from a vine, they are often called “berry” aneurysms. Most aneurysms occur in arteries on the brain’s surface. You can have a brain aneurysm for years and not have any symptoms. But sometimes the aneurysm bursts, and blood flows into the space outside the brain. The result is a subarachnoid hemorrhage, a type of hemorrhagic stroke. (See page 38 for more information.)

Symptoms of aneurysm may include:

- pain above and behind the eye
- numbness or weakness on one side of the face
- problems seeing (such as double vision)

Call your doctor if you have these symptoms. Large aneurysms can often be treated to prevent them from bursting.



BRAIN ANEURYSM

Preventing stroke

At some point, 39 percent of women in the United States will develop heart disease, stroke, or other diseases involving narrowing or hardening of the arteries. It is important for all women to pay attention to their risk factors for these diseases. The most important things you can do to reduce your chances of stroke are:

- Treat high blood pressure.
- Don't smoke cigarettes.
- Maintain an active lifestyle.

If you have high blood pressure, you may be able to lower it by:

- losing weight if you are overweight or obese
- getting 30 minutes of moderate-intensity physical activity on most days of the week
- limiting alcohol to one drink per day
- eating foods that are good for your heart
- reducing stress

Your doctor may prescribe medicines to lower your blood pressure. It is important to take them as prescribed and not stop them unless directed by your doctor.

Some research suggests that healthy women older than age 65 may reduce their stroke risk by taking 80 mg aspirin, or baby aspirin, daily. Aspirin makes blood clots less likely, which reduces the risk of an ischemic stroke. **But aspirin** can have serious side effects, such as bleeding in your stomach or intestines. If you're thinking about taking aspirin, talk with your doctor first.

Choosing a hospital

The hospital you go to can matter a great deal. You have a better chance of having a good outcome if you are taken to a certified stroke center at a hospital with the staff, equipment, and experience needed to treat stroke quickly and correctly.

Stroke Centers

To find a certified stroke center near you, see the Web sites of the Joint Commission on the Accreditation of Healthcare Organizations and the National Stroke Association, listed in the resource section on page 48.

As of August 2007, the following states have developed or are in the process of developing their own regulations for certifying hospitals as stroke centers:

- Florida
- Maryland
- Massachusetts
- New Jersey
- New York
- Texas

If you live in these states, call your state health department to find out if there is a state-certified stroke center near you.



Find the nearest certified stroke center, and share the name and address with your family or caregivers. Tell them that if you have a stroke, you want to be taken to that hospital. Even if you live in a rural area, you might be able to be taken to a certified stroke center by helicopter.

How is a stroke diagnosed?

Once you get to the hospital, the following things will happen quickly:

- A doctor or nurse will ask you or your companion about your symptoms and when they began.
- You will be asked to perform several physical and mental tasks to see what parts of your brain might be affected by the stroke.
- You will be given various tests to rule out other possible causes of your symptoms.

If your doctor decides that you may have had a stroke, the next step will be to use one or more brain imaging techniques to see where the stroke is located. The two main techniques are computed tomography (tuh-MOG-ruh-fee) (CT) scan and magnetic resonance imaging (MRI). A CT scan is more commonly used because it is faster and more readily available in most hospitals.

How is a stroke treated?

If your brain scan shows that you've had an ischemic stroke, you may be given a shot of tissue plasminogen (plaz-MIN-uh-juhn) activator, or t-PA, into one of your veins. This drug travels in the blood to the brain and breaks up the clot. t-PA must be given within 3 hours from the time your stroke started for it

to work properly and safely. In fact, the sooner t-PA is given, the better it works. That's why it's important for you to get to the hospital as quickly as possible.

A new therapy for ischemic strokes is the Mechanical Embolus Removal for Cerebral Ischemia (MERCi) system. This involves threading a thin wire through your blood vessels and into the artery in the brain that is blocked by a clot. The wire is used to pull the clot out of the body. The MERCi system can be used for up to 8 hours after the start of an ischemic stroke.

There are fewer treatments for intracerebral hemorrhages (bleeding into the brain) than for ischemic strokes. Usually, little can be done to stop the bleeding. But treatment usually involves trying to reduce pressure within the skull caused by bleeding with drugs or surgery. Research suggests that a new drug, called activated factor VII, can slow the bleeding if given within 4 hours of when it started. But this drug is still being tested and is not yet available for use in hospitals.



If you have a subarachnoid hemorrhage because of a burst aneurysm, brain surgery will be needed to stop the bleeding from the aneurysm.

Stroke Treatment Research

Much progress in stroke treatment has been made over the past decade. And many new treatments are in the final stages of testing and likely to be available for widespread use in the next few years. Not long ago, doctors considered stroke an untreatable disease, but no more. The future of stroke treatment is looking brighter.

Effects of a stroke

After a stroke, you may have problems caused by damage to parts of your brain. What problems you have depend on which parts of your brain were damaged. Some of the problems that you may have after a stroke include:

- **Movement.** You may have problems moving an arm, a leg, a part of your face, or the entire side of your body. You may also have problems swallowing.
- **Sensations.** You may lose the ability to feel touch, pain, temperature, or position. Or you may experience pain or odd sensations of tingling or prickling.
- **Language.** You may have problems speaking, writing, or understanding spoken or written words.
- **Thinking and memory.** You may have a short attention span or have trouble remembering something you just learned. Or you may lose the ability to plan and carry out steps in a complex task.



- **Emotions.** The most common emotional problem faced by stroke survivors is depression. If you have depression, it's important that you get treatment (see below for information on treating depression). Another common problem among stroke survivors is pseudobulbar (soo-doh-BUHL-bar) affect. If you have this condition, you might laugh or cry at inappropriate times. For instance, you might laugh at a sad story or cry for no reason. Because a person with pseudobulbar affect may cry uncontrollably, the condition is often mistaken for depression.

Therapies for stroke recovery

In the first several months after a stroke, some of the abilities that you lost may return on their own, but others may not. The good news is that there are therapies that can help you recover functions or learn new ways of doing things. The more you work at these therapies, the more likely you will be to recover many

of your abilities. Also, there seems to be no time limit for recovering. Research shows that some people who have had a stroke may keep recovering for years after the stroke.

There are many different types of therapies used to help stroke patients lead independent lives.

- Physical therapy helps you relearn simple movements, such as walking, sitting, standing, and lying down.
- Occupational therapy helps you relearn everyday activities, such as eating, drinking, dressing, and going to the bathroom.
- Speech therapy helps you relearn how to speak and use language. Speech therapists can also help if you're having trouble swallowing.
- Psychotherapy helps you deal with your emotional problems. Depression, for instance, can be treated with a combination of medicines and counseling.



Research is leading to exciting new techniques to help stroke survivors. For instance, experts are developing robotic braces that fit over one or more joints and help you relearn movements.

Most stroke survivors find that regaining lost abilities is hard work. It is normal to feel tired and discouraged at times because things that used to be easy are now difficult. The important thing is to notice the progress you make and take pride in each achievement.

How family members can help

If you are a family member of a stroke survivor, here are some things you can do:

- Support your loved one's efforts to help make decisions about their therapies.
- Encourage them to be as independent as possible.
- Strive to be compassionate, patient, positive, tolerant, and respectful.
- Visit and talk with your loved one. Do things together, such as playing cards or a board game.
- Participate in education offered for stroke survivors and their families.
- Ask physical and occupational therapists how to outfit your home for the stroke survivor. For instance, you may



need to install grab bars in the bathroom to help your loved one use the toilet, tub, or shower.

- If your loved one has trouble speaking or understanding speech, ask the speech therapist how you can help.
- To prevent bedsores, make sure your loved one does not sit or lie in the same position for long periods of time.
- Take care of yourself by eating well, getting enough rest, and taking time to do things that you enjoy.

Perhaps most important, remember that caring family and friends can be a key factor in helping stroke survivors recover. ■

One Woman's Story

I was 5 months pregnant and 36 years old at the time, casually talking on the phone when suddenly my right side became paralyzed and I lost my ability to speak. I began crawling on my hands and knees, motioning to my older daughter for help. Ten-year-old Chelsea knew I was in serious trouble and called 911 right away.

When I arrived at the hospital, I was paralyzed on the right side of my body and could not talk. My husband described me as being “in a vegetative state,” and the doctors discussed nursing home placement. I remained in the hospital for five days and was then transferred to another facility for rehabilitation.

I was determined to regain function, and soon I was doing exercises to strengthen my hand and arms. I had to learn how to change a baby diaper and bathe a baby using only one hand. I progressed to walking just three days after being discharged home and by the seventh day, I had regained my speech.

I had thought I was in good health. Yet prior to getting pregnant, I sought an evaluation from my doctor for some frightening symptoms: my right arm would become numb for a short period of time or I would experience “pins and needles.” Sometimes I would have

vision changes. Sometimes I could not speak. But these symptoms would last only a short time before everything would return to normal. I now know that I had been experiencing TIAs, which often serve as warning signs for an impending stroke. My original doctor did not order testing, and I was forced to change doctors to get the care I needed. My new doctor's tests all came back negative and I received the OK to get pregnant.

I learned that while stroke is uncommon in pregnancy, it does happen. I also had high blood pressure during the pregnancy, which is a risk factor for stroke. As an African American woman, I was also at a higher risk for stroke.

My baby is fine. I have a healthy son. I can once again care for my family. After my recovery, my mission became to raise awareness of stroke symptoms, not just as a survivor and mom, but as Mrs. New Jersey 2002—winner of the state beauty pageant!

Cynthia

New Jersey

This story is provided courtesy of the Women's Heart Foundation.

As an African American woman, I was also at a higher risk for stroke.

For More Information...

Office on Women's Health, HHS

200 Independence Ave SW, Room 712E
Washington, DC 20201

Web site: www.womenshealth.gov/heart
www.womenshealth.gov/faq/stroke.htm
Phone number: (800) 994-9662,
(888) 220-5446 TDD

National Heart, Lung, and Blood Institute Health Information Center, NIH

PO Box 30105
Bethesda, MD 20824-0105

Web site: www.nhlbi.nih.gov
www.hearttruth.gov

Phone number: (301) 592-8573,
(240) 629-3255 TTY

National Institute of Neurological Disorders and Stroke, NIH

PO Box 5801
Bethesda, MD 20824

Web site: www.ninds.nih.gov
Phone number: (800) 352-9424,
(301) 468-5981 TTY

American Stroke Association

7272 Greenville Ave
Dallas, TX 75231

Web site: www.strokeassociation.org
Phone number: (888) 478-7653

The Internet Stroke Center

Washington University School of Medicine
Department of Neurology
660 S Euclid, Box 8111
St Louis, MO 63110

Web site: www.strokecenter.org

National Stroke Association

9707 E Easter Ln, Building B
Centennial, CO 80112

Web site: www.stroke.org
Phone number: (800) 787-6537

To find a stroke center near you, visit:

The Joint Commission

www.qualitycheck.org