

## What is a Stroke?

A stroke is a medical emergency. Strokes happen when blood flow to your brain stops. Within minutes, brain cells begin to die.

There are two kinds of stroke. The more common kind, called **ischemic stroke**, is caused by a blood clot that blocks or plugs a blood vessel in the brain. The other kind, called **hemorrhagic stroke**, is caused by a blood vessel that breaks and bleeds into the brain. "Mini-strokes" or transient ischemic attacks (TIAs), occur when the blood supply to the brain is briefly interrupted.

Symptoms of stroke are

- Sudden numbness or weakness of the face, arm or leg (especially on one side of the body)
- Sudden confusion, trouble speaking or understanding speech
- 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 you have any of these symptoms, you must get to a hospital quickly to begin treatment. Acute stroke therapies try to stop a stroke while it is happening by quickly dissolving the blood clot or by stopping the bleeding.

Drug therapy with blood thinners is the most common treatment for stroke. There are two main types of blood thinners. *Anticoagulants*, such as heparin or warfarin (also called Coumadin), work on chemical reactions in your body to lengthen the time it takes to form a blood clot. *Antiplatelet drugs*, such as aspirin, prevent blood cells called platelets from clumping together to form a clot.

When you take a blood thinner, follow directions carefully. Make sure that your healthcare provider knows all of the medicines and supplements you are using

A stroke can cause lasting brain damage. People who survive a stroke need to relearn skills they lose because of the damage. Post-stroke rehabilitation helps individuals overcome disabilities that result from stroke damage.

Stroke can cause five types of disabilities:

- Paralysis or problems controlling movement
- Pain and other problems with the senses
- Problems using or understanding language
- Problems with thinking and memory
- Emotional disturbances

Stroke rehabilitation involves many kinds of health professionals. The goal is to help survivors become as independent as possible and to have the best possible quality of life.

### Causes

There are two major types of stroke:

- Ischemic stroke
- Hemorrhagic stroke

Ischemic stroke occurs when a blood vessel that supplies blood to the brain is blocked by a blood clot. This may happen in two ways:

- A clot may form in an artery that is already very narrow. This is called a thrombotic stroke.
- A clot may break off from another place in the blood vessels of the brain, or from some other part of the body, and travel up to the brain. This is called cerebral embolism, or an embolic stroke.

Ischemic strokes may be caused by a sticky substance called plaque that can clog arteries.

A hemorrhagic stroke occurs when a blood vessel in part of the brain becomes weak and bursts open. This causes blood to leak into the brain. Some people have defects in the blood vessels of the brain that make this more likely. These defects may include:

- Aneurysm
- Arteriovenous malformation (AVM)

High blood pressure is the main risk factor for strokes. The other major risk factors are:

- Atrial fibrillation
- Diabetes
- Family history of stroke
- High cholesterol
- Increasing age, especially after age 55
- Race (black people are more likely to die of a stroke)

Stroke risk is also higher in:

- People who have heart disease or poor blood flow in their legs caused by narrowed arteries
- People who have unhealthy lifestyle habits such as smoking, high fat diet, and lack of exercise
- Women who take birth control pills (especially those who smoke and are older than 35)

## Symptoms

The symptoms of stroke depend on what part of the brain is damaged. In some cases, a person may not know that a stroke has occurred. Most of the time, symptoms develop suddenly and without warning. However, symptoms may occur on and off for the first day or two. Symptoms are usually most severe when the stroke first happens, but they may slowly get worse.

A headache may occur if the stroke is caused by bleeding in the brain. The headache:

- Starts suddenly and may be severe
- Occurs when you are lying flat
- Wakes you up from sleep
- Gets worse when you change positions or when you bend, strain, or cough

Other symptoms depend on how severe the stroke is and what part of the brain is affected. Symptoms may include:

- Change in alertness (including sleepiness, unconsciousness, and coma)
- Changes in hearing
- Changes in taste
- Changes that affect touch and the ability to feel pain, pressure, or different temperatures
- Clumsiness
- Confusion or loss of memory
- Difficulty swallowing
- Difficulty writing or reading
- Dizziness or abnormal feeling of movement (vertigo)
- Lack of control over the bladder or bowels
- Loss of balance
- Loss of coordination
- Muscle weakness in the face, arm, or leg (usually just on one side)
- Numbness or tingling on one side of the body
- Personality, mood, or emotional changes
- Problems with eyesight, including decreased vision, double vision, or total loss of vision
- Trouble speaking or understanding others who are speaking
- Trouble walking

## Exams and Tests

The doctor will do a physical exam to:

- Check for problems with vision, movement, feeling, reflexes, understanding, and speaking. Your doctor and nurses will repeat this exam over time to see if your stroke is getting worse or improving.
- Listen for an abnormal sound, called a "bruit," when using a stethoscope to listen to the carotid arteries in the neck. A bruit is caused by abnormal blood flow.
- Check for high blood pressure

You may have the following tests to help find the type, location, and cause of the stroke and rule out other disorders:

- Angiogram of the head to look for a blood vessel that is blocked or bleeding
- Carotid duplex (ultrasound) to see if the carotid arteries in your neck have narrowed
- Echocardiogram to see if the stroke could have been caused by a blood clot from the heart
- Magnetic resonance angiography (MRA) or CT angiography to check for abnormal blood vessels in the brain

Other tests include:

- Blood tests
- Electrocardiogram (ECG) and heart rhythm monitoring

## Treatment

A stroke is a medical emergency. Quick treatment is needed. Call 911 or your local emergency number or seek urgent medical care at the first signs of a stroke.

People who are having stroke symptoms need to get to a hospital as quickly as possible.

- If the stroke is caused by a blood clot, a clot-busting drug may be given to dissolve the clot.
- This treatment must be started within 3 to 4 1/2 hours of when the symptoms first started to be effective.

Other treatments given in the hospital will depend on the cause of the stroke. These may include:

- Blood thinners such as heparin, warfarin (Coumadin), aspirin, or clopidogrel (Plavix)
- Medicine to control symptoms such as high blood pressure
- Special procedures or surgery to relieve symptoms or prevent more strokes
- Nutrients and fluids

- Feeding tube in the stomach (gastrostomy tube)

Physical therapy, occupational therapy, speech therapy, and swallowing therapy will all begin in the hospital.

The goal of treatment after a stroke is to help you recover as much function as possible and prevent future strokes.

Recovery from your stroke will begin while you are still in the hospital or at a rehabilitation center. It will continue when you go home from the hospital or center.

### Support Groups

Support and resources are available from the American Stroke Association | [www.strokeassociation.org](http://www.strokeassociation.org).

### Outlook (Prognosis)

The outlook depends on:

- The type of stroke
- How much brain tissue is damaged
- What body functions have been affected
- How quickly you get treated

Problems moving, thinking, and talking often improve in the weeks to months after a stroke.

Many people who have had a stroke will keep improving in the months or years after their stroke.

Over half of people who have a stroke are able to function and live at home. Other people are not able to care for themselves.

If treatment with clot-busting drugs is successful, the symptoms of a stroke may go away. However, patients often do not get to the hospital soon enough to receive these drugs, or they cannot take these drugs because of a health condition.

People who have a stroke due to a blood clot (ischemic stroke) have a better chance of surviving than those who have a stroke due to bleeding in the brain (hemorrhagic stroke).

The risk for a second stroke is highest during the weeks or months after the first stroke. The risk begins to decrease after this period.

### When to Contact a Medical Professional

Stroke is a medical emergency that needs to be treated right away. Call your local emergency number (such as 911) if someone has symptoms of a stroke.

### Prevention

Reducing your stroke risk factors lessen your chances of a having stroke.

## **Stroke risk factors and prevention**

### *Risk Factors You CANNOT Change*

- Your age. Risk of stroke increases with age.
- Your gender. Men have a higher risk of getting heart disease than women except in older adults.
- Your genes or race. If your parents had a stroke, you are at higher risk. African-Americans, Mexican Americans, American Indians, Hawaiians, and some Asian Americans also have a higher risk for heart problems.
- Diseases such as cancer, chronic kidney disease, and some types of arthritis
- Weak areas in an artery wall or abnormal arteries and veins
- Pregnancy-- both during and in the weeks right after the pregnancy

Blood clots from the heart may travel to the brain and cause a stroke. This may happen in people with man-made or infected heart valves or in certain heart defects you were born with. Other causes of blood clots are a very weak heart and some abnormal heartbeats,

### *Risk Factors You CAN Change*

You can change some risk factors for stroke, by taking the following steps:

- Do not smoke. If you do smoke, quit.
- Control your cholesterol through diet, exercise, and medicines, if needed.
- Control high blood pressure through diet, exercise, and medicines, if needed.
- Control diabetes through diet, exercise, and medicines, if needed.
- Exercise at least 30 minutes a day.
- Maintain a healthy weight by eating healthy foods, eating less, and joining a weight loss program, if needed.
- Limit how much alcohol you drink. This means 1 drink a day for women and 2 a day for men.
- Avoid cocaine and other illegal drugs.
- Talk to your doctor about the risk of birth control pills. Birth control pills can increase the chance of blood clots, which can lead to stroke. Clots are more likely in women who also smoke and who are older than 35.

Good nutrition is important to your heart health and will help control some of your stroke risk factors.

- Choose a diet rich in fruits, vegetables, and whole grains.
- Choose lean proteins, such as chicken, fish, beans and legumes.
- Choose low-fat dairy products, such as 1% milk and other low-fat items.

- Avoid sodium (salt) and fats found in fried foods, processed foods, and baked goods.
- Eat fewer animal products and foods that contain cheese, cream, or eggs.

Read labels, and stay away from "saturated fat" and anything that contains "partially-hydrogenated" or "hydrogenated" fats. These products are usually loaded with unhealthy fats.

Your doctor may suggest taking aspirin or another drug called clopidogrel (Plavix) to help prevent blood clots from forming. DO NOT take aspirin without talking to your doctor first.

If you are taking these drugs or other blood thinners, you should take steps to prevent yourself from falling or tripping.

Follow these guidelines and the advice of your doctor to lower your chances of stroke.

### **Stroke - discharge**

You or your loved one was in the hospital after having a stroke. Stroke happens when blood flow to part of the brain stops.

First, you or your loved one received treatment to prevent any further damage to the brain, and to help the heart, lungs, and other important parts of your body.

After you were stable, doctors did testing and treatment to help with recovery from the stroke and prevention of a future stroke. You may have stayed in special units that help people to recover after a stroke.

#### *What to Expect at Home*

Because of possible injury to the brain from the stroke, you may notice problems with:

- Changes in behavior
- Doing easy tasks
- Memory
- Moving one side of the body
- Muscle spasms
- Paying attention
- Sensation or awareness of one part of the body
- Swallowing
- Talking or understanding others
- Thinking
- Seeing to one side (hemianopia)

You may need help with many daily activities you used to do alone before the stroke.

Depression after stroke is fairly common as you or your loved one learns to live with the changes. It may develop soon after stroke, but symptoms of depression may not be present for up to 2 years after the stroke.

Do not drive your car without your doctor's permission.

### *Moving Around*

Moving around and doing normal tasks may be hard after you or your loved one have a stroke.

Make sure your home is safe. Ask your doctor, therapist, or nurse about making changes in the home to make it easier to do everyday activities.

Learn to make your home safer if your loved one has memory problems from the stroke and could wander away inside the home or away from the home. Find out about what you can do to prevent falls and keep your bathroom safe to use.

Family and caregivers may need to help with:

- Exercises to keep your elbows, shoulders, and other joints loose
- Watching for joint tightening (contractures)
- Making sure splints are used in the correct way
- Making sure arms and legs are in a good position when sitting or lying

If you or your loved one is using a wheelchair, follow-up visits to make sure it fits well are important to prevent skin ulcers.

- Check every day for pressure sores at the heels, ankles, knees, hips, tailbone, and elbows.
- Change positions in the wheelchair several times per hour during the day to prevent pressure ulcers.
- If you have problems with spasticity, learn about what makes it worse. You or your caregiver can learn exercise to keep your muscles loose.
- Learn how to prevent pressure ulcers.

### *Thinking and Speaking*

Tips for making clothing easier to put on and take off are:

- Do not provide too many choices.
- Velcro is much easier than buttons and zippers. All buttons and zippers should be in the front of a piece of clothing.
- Use pullover clothes and slip-on shoes.



People who have had a stroke may have speech or language problems. Tips for talking with your loved one are:

- Keep distractions and noise down. Move to a quieter room.
- Give the person plenty of time to answer. After a stroke, it will take them longer to process what has been said.
- Use simple words and sentences, speaking slowly. Keep your voice lower. Repeat if needed. Use familiar names and places. Tell them when you are going to change the subject. Do not yell or shout.
- Make eye contact before touching or speaking if possible.
- Ask questions in a manner that they can be answered with a yes or no. When possible, give clear choices. Use props or visual prompts when possible. Do not give too many options.

When giving someone instructions after a stroke:

- Break down instructions into small and simple steps.
- Allow time for them to be understood.

Try using other ways of communicating:

- You may be able to use pointing or hand gestures or drawings.
- It may help the person with aphasia and their caregivers to make a book with pictures or words about common topics or people so that they can communicate better.

### *Bowel Care*

Nerves that help your bowels work smoothly can be damaged after a stroke. Have a routine. Once you find a bowel routine that works, stick with it.

- Pick a regular time, such as after a meal or a warm bath, to try to have a bowel movement.
- Be patient. It may take 15 to 45 minutes to have bowel movements.
- Try gently rubbing your stomach to help stool move through your colon.

Avoid constipation:

- Drink more fluids.
- Stay active or become more active.
- Eat a diet with lots of fiber.

Ask your doctor about medicines you, or your loved one, are taking that may cause constipation (such as some medicines for depression, pain, bladder control, and muscle spasms).

## *Medication*

Have all of your prescriptions filled before you go home. It is very important that you take your drugs the way your doctor or nurse told you to. Do not take any other drugs, supplements, vitamins, or herbs without asking your doctor about them first.

You may be given one or more of the following drugs. These drugs are meant to control your blood pressure or cholesterol, or keeping your blood from clotting. They may help prevent another stroke:

- Antiplatelet drugs (aspirin or Clopidogrel) help keep your blood from clotting.
- Beta blockers or ACE inhibitor medicines may help protect your heart.
- Diuretics (or water pills), ACE inhibitors, Beta-blockers, and other medications will help control blood pressure.
- Statins or other drugs that lower your cholesterol.
- If you have diabetes, control your blood sugar at the level your doctor or nurse recommends.

Do not just stop taking any of these drugs, as well as drugs for your diabetes, high blood pressure, or any other medical problems you may have.

If you are taking a blood thinner, such as warfarin (Coumadin), you may need to have extra blood tests.

## **Staying Healthy**

If you have problems with swallowing, you must learn to follow a special diet that makes eating safer. Ask your doctor what the signs of swallowing problems are. Learn tips to make feeding and swallowing easier and safer.

Learn more about what you should eat to make your heart and blood vessels healthier.

- Avoid salty and fatty foods.
- Stay away from fast food restaurants

Try to limit how much alcohol you drink. Ask your doctor when you may start. Even if you are allowed to drink, limit yourself -- women may have one drink a day and men may have two drinks a day.

Keep up to date with your vaccinations. Get a flu shot every year. Ask your doctor if you need a pneumonia shot.

Do not smoke cigarettes. Ask your doctor for help quitting if you need to. Do not let anybody smoke in your home.

Try to stay away from stressful situations. If you feel stressed all the time or feel very sad and blue, talk with your doctor or nurse.

Many patients who have had a stroke feel sad or depressed at times. Talk to friends or family about this. Ask your doctor about seeing a professional to help you with these feelings.

#### When to Call the Doctor

Call your doctor if you have:

- Problems taking drugs for muscle spasms
- Problems moving your joints (joint contracture)
- Problems moving around or getting out of your bed or chair
- Skin sores or redness
- Pain that is becoming worse
- Recent falls
- Choking or coughing when eating
- Signs of a bladder infection (fever, burning when you urinate, or frequent urination)

Call 911 if the following symptoms develop suddenly or are new:

- Numbness or weakness of the face, arm, or leg
- Blurry or decreased vision
- Not able to speak or understand
- Dizziness, loss of balance, or falling
- Severe headache

#### **Recovering after stroke**

Each person has a different recovery time and need for long-term care. Problems with moving, thinking, and talking often improve in the first weeks or months after a stroke. Some people will keep improving months or years after a stroke.

#### *WHERE TO LIVE AFTER A STROKE*

Most patients will need stroke rehabilitation (rehab) to help them recover after they leave the hospital. Stroke rehab will help you regain the ability to care for yourself.

Most types of therapy can be done where you live, including in the home.

- People who are not able to care for themselves at home after a stroke may have therapy in a special part of a hospital or in a nursing or rehabilitation center.
- Those who are able to go back home might go to a special clinic or have someone come to their home.

Whether you can go back home after a stroke depends on:

- Whether you can take care of yourself
- How much help there will be at home
- Whether the home is a safe place (for example, stairs in the home might not be safe for a stroke patient who has trouble walking)

You may need to go to a boarding home or convalescent home to have a safe environment.

For people who are cared for at home:

- Changes may be needed to stay safe from falls in the home and bathroom, prevent wandering, and make the home easier to use. The bed and bathroom should be easy to reach. Items (such as throw rugs) that may cause a fall should be removed.
- A number of devices can help with activities such as cooking or eating, bathing or showering, moving around the home or elsewhere, dressing and grooming, writing and using a computer, and many more activities.
- Family counseling may help you cope with the changes needed for home care. Visiting nurses or aides, volunteer services, homemakers, adult protective services, adult day care, and other community resources (such as a local Department of Aging) may be helpful.
- Legal advice may be needed. Advance directives, power of attorney, and other legal actions may make it easier to make decisions about care.

### *SPEAKING AND COMMUNICATING*

After a stroke, some people may have problems finding a word or being able to speak more than one word or phrase at a time. Or, they may have trouble speaking at all. This is called aphasia.

- People who have had a stroke may be able to put many words together, but they may not make sense. Patients do not usually know that what they are saying is not easy to understand. They may get frustrated when they realize other people cannot understand.
- It can take up to 2 years to recover speech. Not everyone will fully recover.

A stroke can also damage the muscles that help you speak. As a result, these muscles do not move the right way when you try to speak.

A speech and language therapist can work with you and your family or caregivers. You can learn new ways to communicate.

See also:

- Communicating with someone with aphasia
- Dysarthria - care

## *THINKING AND MEMORY*

After a stroke, people may have:

- Changes in their ability to think or reason
- Changes in behavior
- Memory problems
- Poor judgment

These problems increase the need for safety precautions.

Depression after a stroke is common. Depression can start soon after a stroke, but symptoms may not begin for up to 2 years after the stroke. Treatments for depression include:

- Increased social activity -- more visits in the home or going to an adult day care center for activities
- Medicines for depression and visits to a therapist or counselor

## *MUSCLE, JOINT, AND NERVE PROBLEMS*

Moving around and doing normal daily tasks such as dressing and feeding may be harder after a stroke.

Muscles on one side of the body may be weaker or may not move at all. This may involve only part of the arm or leg, or the whole side of the body.

- Muscles on the weak side of the body may be very tight.
- Different joints in the body may become hard to move. The shoulder and other joints may dislocate.

Many of these problems can cause pain after a stroke. Pain may also occur from changes in the brain itself. You may use pain medicines, but check with your health care provider first. People who have pain due to tight muscles may get medicines that help with muscle spasms.

Physical therapists, occupational therapists, and rehabilitation doctors will help you relearn how to:

- Dress, groom, and eat
- Bathe, shower, and use the toilet
- Use canes, walkers, wheelchairs, and other devices to stay as mobile as possible
- Possibly return to work
- Keep all of the muscles as strong as possible and stay as physically active as possible, even if you cannot walk

- Manage muscle spasms or tightness with stretching exercises and braces that fit around the ankle, elbow, shoulder, and other joints

### *BLADDER AND BOWEL CARE*

A stroke can lead to problems with bladder or bowel control. These problems may be caused by:

- Damage to part of the brain that helps the bowels and bladder work smoothly
- Not noticing the need to go to the bathroom
- Problems getting to the toilet in time

Symptoms may include:

- Loss of bowel control, diarrhea (loose bowel movements), or constipation (hard bowel movements)
- Loss of bladder control, feeling the need to urinate often, or problems emptying the bladder

Certain medicines your doctor may prescribe may help with bladder control. You may need a referral to a bladder or bowel specialist.

Sometimes, a bladder or bowel schedule will help. It can also help to place a commode chair close to where you sit most of the day. Some people need a permanent urinary catheter to drain urine from their body.

To prevent skin or pressure sores:

- Clean up after incontinence
- Change position often and know how to move in a bed, chair, or wheelchair
- Make sure the wheelchair fits correctly
- Have family members or other caregivers learn how to watch out for skin sores

### *SWALLOWING AND EATING AFTER A STROKE*

Swallowing problems may be due to a lack of attention when eating or damage to the nerves that help you swallow.

Symptoms of swallowing problems are:

- Coughing or choking, either during or after eating
- Gurgling sounds from the throat during or after eating
- Throat clearing after drinking or swallowing
- Slow chewing or eating

- Coughing food back up after eating
- Hiccups after swallowing
- Chest discomfort during or after swallowing

A speech therapist can help with swallowing and eating problems after a stroke. Diet changes, such as thickening liquids or eating pureed foods, may be needed. Some people will need a permanent feeding tube, called a gastrostomy.

Some people do not take in enough calories after a stroke. High-calorie foods or food supplements that also contain vitamins or minerals can prevent weight loss and keep you healthy.

### *OTHER IMPORTANT ISSUES*

Both men and women may have problems with sexual function after a stroke. Medications called phosphodiesterase type 5 inhibitors (Viagra or Cialis) may be helpful. Ask your health care provider whether these drugs are right for you. Talking with a therapist or counselor may also help.

Treatment and lifestyle changes to prevent another stroke are important. This includes healthy eating, controlling illnesses such as diabetes and high blood pressure, and sometimes taking medicine to help prevent stroke.

### **Communicating with someone with aphasia**

People with have aphasia have speech problems. They may have trouble:

- Finding the right word
- Saying more than 1 word or phrase at a time
- Speaking at all

This type of aphasia is called non-fluent aphasia. People who have it may understand what another person is saying to them, or they may NOT understand or be able to speak.

Another kind of aphasia is fluent aphasia. People who have fluent aphasia may be able to put many words together, but what they say may not make sense. They are often unaware that they are not making sense.

People who have either kind of aphasia may become frustrated when they realize others cannot understand them, when they cannot understand others, or when they cannot find the right words.

A speech and language therapist can work with a person who has aphasia and their family or caregivers to improve their ability to communicate.

The most common cause of aphasia is a stroke. Recovery may take up to 2 years, though not everyone fully recovers.

### *Improving Daily Communication*

There are many ways to help a person with aphasia.

Keep distractions and noise down:

- Turn off the radio and TV.
- Move to a quieter room.

Talk to people who have aphasia in adult language. Do not make them feel as if they are a child. Do not pretend to understand them if you do not.

If they can not understand you, do not shout. Unless they also have a hearing problem, shouting will not help. Make eye contact when talking to the person with aphasia.

When you ask questions:

- Ask questions in a way they can answer you with a simple "yes" or "no."
- When possible, give clear choices for possible answers, but do not give them too many choices.
- Visual prompts are also helpful, when you can give them.

When you give instructions:

- Break down instructions into small and simple steps.
- Allow time for the person with aphasia to understand. Sometimes this can be a lot longer than you expect.
- If the patient becomes frustrated, consider changing to another activity.

You can encourage the person with aphasia to use other ways to communicate. Some are:

- Pointing
- Hand gestures
- Drawings

It may help the person with aphasia and their caregivers to make a book with pictures or words about common topics or people so that they can communicate better.

Always try to keep the person with aphasia involved in conversations. Check with them to make sure they understand. But do not push too hard for them to understand, since this may cause more frustration.

Do not try to correct the person with aphasia if they remember something incorrectly.



Begin to take the person with aphasia out more, as they become more confident. This will allow them to practice communicating and understanding in real-life situations.

When leaving someone with speech problems alone, make sure they have an ID card that:

- Has information on how to contact family members or caregivers
- Explains their speech problem and how best to communicate with them

Consider joining support groups for people with aphasia and their families