

# Stroke

## What is a stroke?

A stroke is a life-threatening condition that happens when part of your brain doesn't have enough blood flow. This most commonly happens because of a blocked artery or bleeding in your brain. Without a steady supply of blood, the brain cells in that area start to die from a lack of oxygen.

**IMPORTANT:** A stroke is a life-threatening emergency condition where every second counts. If you or someone with you has symptoms of a stroke, **IMMEDIATELY** call 911 (or your local emergency services number). The quicker stroke is treated, the more likely you'll recover without disability.

To recognize the warning signs of a stroke, remember to think **BE FAST**:

- B. Be watchful for a sudden loss of balance.
- E. Look out for sudden loss of vision in one or both eyes. Are they experiencing double vision?
- F. Ask the person to smile. Look for a droop on one or both sides of their face, which is a sign of muscle weakness or paralysis.
- A. A person having a stroke often has muscle weakness on one side. Ask them to raise their arms. If they have one-sided weakness (and didn't have it before), one arm will stay higher while the other will sag and drop downward.
- S. Strokes often cause a person to lose their ability to speak. They might slur their speech or have trouble choosing the right words.
- T. Time is critical, so don't wait to get help! If possible, look at your watch or a clock and remember when symptoms start. Telling a healthcare provider when symptoms started can help the provider know what treatment options are best for you.

## Who does it affect?

Anybody can have a stroke, from children to adults, but there are some people who have a greater risk than others. Strokes are more common later in life (about two-thirds of strokes happen in people over age 65).

There are also certain medical conditions that increase the risk of stroke, including high blood pressure (hypertension), high cholesterol (hyperlipidemia), Type 2 diabetes, and people who have a history of stroke, heart attack or irregular heart rhythms like atrial fibrillation.

## How common is a stroke?

Strokes are very common. Worldwide, strokes rank second among the top causes of death. In the United States, stroke is the fifth cause of death. Strokes are also a leading cause of disability worldwide.

## **How does a stroke affect my body?**

Strokes are to your brain what a heart attack is to your heart. When you have a stroke, part of your brain loses its blood supply, which keeps that brain area from getting oxygen. Without oxygen, the affected brain cells become oxygen-starved and stop working properly.

If your brain cells go too long without oxygen, they'll die. If enough brain cells in an area die, the damage becomes permanent, and you may lose the abilities that area once controlled. However, restoring blood flow may prevent that kind of damage or at least limit how severe it is. That's why time is critical in treating a stroke.

## **What are the types of stroke?**

There are two main ways that strokes can happen: ischemia and hemorrhage.

### **Ischemic stroke**

Ischemia (pronounced "iss-key-me-uh") is when cells don't get enough blood flow to supply them with oxygen. This usually happens because something blocks blood vessels in your brain, cutting off blood flow. Ischemic strokes are the most common and account for about 80% of all strokes.

Ischemic strokes usually happen in one of the following ways:

- Formation of a clot in your brain ([thrombosis](#)).
- A fragment of a clot that formed elsewhere in your body that breaks free and travels through your blood vessels until it gets stuck in your brain (embolism).
- Small vessel blockage (lacunar stroke), which can happen when you have long-term, untreated high blood pressure (hypertension), high cholesterol (hyperlipidemia) or high blood sugar (Type 2 diabetes).
- Unknown reasons (these are cryptogenic strokes; the word "cryptogenic" means "hidden origin").

### **Hemorrhagic stroke**

[Hemorrhagic](#) (pronounced "hem-or-aj-ick") strokes cause bleeding in or around your brain. This happens in one of two ways:

- Bleeding inside of your brain (intracerebral). This happens when a blood vessel inside of your brain tears or breaks open, causing bleeding that puts pressure on the surrounding brain tissue.

- Bleeding into the subarachnoid space (the space between your brain and its outer covering). The arachnoid membrane, a thin layer of tissue with a spiderweb-like pattern on it, surrounds your brain. The space between it and your brain is the subarachnoid space (“sub” means “under”). Damage to blood vessels that pass through the arachnoid membrane can cause a [subarachnoid hemorrhage](#), which is bleeding into the subarachnoid space, putting pressure on the brain tissue underneath.

## Symptoms and Causes

An easy way to remember the symptoms of a stroke is the phrase BE FAST. That phrase helps you remember key symptoms related to balance, the eyes, face, arms, speech and that minimizing the time it takes to receive treatment is critical.

### What are the symptoms of a stroke?

Different areas of your brain control different abilities, so stroke symptoms depend on the affected area. An example of this is a stroke that affects Broca’s area, a part of your brain that controls how you use muscles in your face and mouth to speak. That’s why some people slur their words or have trouble speaking when they have a stroke.

The symptoms of stroke can involve one or more of the following:

- One-sided weakness or [paralysis](#).
- [Aphasia](#) (difficulty with or loss of speaking ability).
- [Slurred or garbled speaking \(dysarthria\)](#).
- Loss of muscle control on one side of your face.
- Sudden loss — either partial or total — of one or more senses ([vision](#), [hearing](#), [smell](#), [taste](#) and touch).
- Blurred or [double vision \(diplopia\)](#).
- [Loss of coordination or clumsiness \(ataxia\)](#).
- [Dizziness](#) or [vertigo](#).
- [Nausea and vomiting](#).
- Neck stiffness.
- Emotional instability and personality changes.
- Confusion or agitation.
- [Seizures](#).
- [Memory loss \(amnesia\)](#).
- [Headaches \(usually sudden and severe\)](#).
- [Passing out or fainting](#).
- [Coma](#).

### Transient ischemic attack (TIA)

A [transient ischemic attack \(TIA\)](#) — sometimes called a “mini-stroke” — is like a stroke, but the effects are temporary. These are often warning signs that a person has a very high risk of having a true stroke in the near future. Because of that, a person who has a TIA needs emergency medical care as soon as possible.

## What causes a stroke?

Ischemic strokes and hemorrhagic strokes can happen for many reasons. Ischemic strokes usually happen because of blood clots. These can happen for various reasons, such as:

- [Atherosclerosis](#).
- [Clotting disorders](#).
- [Atrial fibrillation](#) (especially when it happens due to [sleep apnea](#)).
- Heart defects ([atrial septal defect](#) or [ventricular septal defect](#)).
- [Microvascular ischemic disease](#) (which can block smaller blood vessels in your brain).

Hemorrhagic strokes can happen for several reasons also, including:

- [High blood pressure](#), especially when you have it for a long time, when it's very high, or both.
- [Brain aneurysms](#) can sometimes lead to hemorrhagic strokes.
- [Brain tumors \(including cancer\)](#).
- Diseases that weaken or cause unusual changes in blood vessels in your brain, such as [moyamoya disease](#).

## Related conditions

Several other conditions and factors can contribute to a person's stroke risk. These include:

- [Alcohol use disorder](#).
- High blood pressure (this can play a role in all types of strokes, not just hemorrhagic ones because it can contribute to blood vessel damage that makes a stroke more likely).
- [High cholesterol \(hyperlipidemia\)](#).
- [Migraine headaches](#) (they can have symptoms similar to a stroke, and people with migraines — especially migraines with [auras](#) — also have a higher risk of stroke at some point in their life).
- [Type 2 diabetes](#).
- [Smoking](#) and other forms of tobacco use (including [vaping](#) and smokeless tobacco).
- Drug misuse (including prescription and non-prescription drugs).

## Is it contagious?

Strokes aren't contagious and you can't pass them to or get them from other people.

## Diagnosis and Tests

### How are strokes diagnosed?

A healthcare provider can diagnose a stroke using a combination of a neurological examination, diagnostic imaging and other tests. During a neurological examination, a provider will have you do certain tasks or answer questions. As you perform these tasks or answer these questions, the provider will look for telltale signs that show a problem with how part of your brain works.

### What tests will be done to diagnose this condition?

The most common tests that happen when a healthcare provider suspects a stroke include:

- [Computerized tomography \(CT\) scan](#).
- Lab blood tests (looking for signs of infections or heart damage, checking clotting ability and blood sugar levels, testing how well kidneys and liver function, etc.).
- [Electrocardiogram \(abbreviated ECG or EKG\)](#) to make sure that a heart issue isn't the source of the problem.
- [Magnetic resonance imaging \(MRI\) scans](#).
- [Electroencephalogram \(EEG\)](#), though less common, can rule out seizures or related problems.

## Management and Treatment

### How are strokes treated?

Treating a stroke depends on many different factors. The most important factor in determining treatment is what kind of stroke a person has.

- **Ischemic:** With ischemic strokes, the top priority is restoring circulation to affected brain areas. If this happens fast enough, it's sometimes possible to prevent permanent damage or at least limit a stroke's severity. Restoring circulation usually involves a certain medication type called thrombolytics, but may also involve a catheterization procedure.
- **Hemorrhagic:** With hemorrhagic strokes, treatment depends on the location and severity of the bleeding. Reducing blood pressure is often the top priority

because this will reduce the amount of bleeding and keep it from getting worse. Another treatment option is to improve clotting so the bleeding will stop. Surgery is sometimes necessary to relieve pressure on your brain from accumulated blood.

## What medications or treatments are used?

The medications and treatments used vary depending on the type of stroke and how soon a person receives treatment after the stroke. There are also long-term treatments for stroke. These happen in the days and months after emergency treatment deals with a stroke's immediate threat.

Overall, your healthcare provider is the best person to tell you what kind of treatment(s) they recommend. They can tailor the information they provide to your specific case, including your medical history, personal circumstances and more.

Some examples of treatments for stroke are as follows:

### Ischemic stroke

Thrombolytic drugs (within three to four and a half hours).

Thrombectomy (within 24 hours if there's no significant brain damage).

Blood pressure management.

### Hemorrhagic stroke

Blood pressure management.

Reversal of any medication that might increase bleeding.

Use of medications or surgery to reduce pressure inside your skull.

## Thrombolytic drugs

[Thrombolytic drugs](#) (their name is a combination of the Greek words "thrombus," which means "clot," and "lysis," which means "loosening/dissolving") are an option within the first three hours after stroke symptoms start. These medications dissolve existing clots. But they're only an option within that three- to four-and-a-half hour time frame because after that, they increase the risk of dangerous bleeding complications.

## **Mechanical thrombectomy**

In some cases, especially ones where thrombolytic drugs aren't an option, a catheterization procedure known as mechanical [thrombectomy](#) is an option. Thrombectomy procedures are also time-sensitive, and the best window for these procedures is within 24 hours after symptoms start. This procedure involves inserting a catheter (tube-like) device into a major blood vessel and steering it up to the clot in your brain. Once there, the catheter has a tool at its tip that can remove the clot.

## **Blood pressure management**

Because high blood pressure is usually why hemorrhagic strokes happen, lowering blood pressure is a key part of treating them. Lowering blood pressure limits bleeding and makes it easier for clotting to seal the damaged blood vessel.

## **Clotting support**

Your body's clotting ability relies on a process called hemostasis to stop bleeding and repair injuries. Supporting hemostasis involves infusion of medications or blood factors that make it easier for clotting to happen. Examples include vitamin K therapy, [prothrombin](#) or clotting factor infusions, and more. This treatment is most common with hemorrhagic strokes, and can help control bleeding (especially for people who take blood-thinning medications).

## **Surgery**

In some cases, surgery is necessary to relieve the pressure on your brain. This is especially true with subarachnoid hemorrhages, which are easier to reach because they're on the outer surface of your brain.

## **Supportive treatments and other methods**

There are several other ways that stroke treatment can happen. Some of these treatments are supportive directly, while others help avoid complications. Your healthcare provider can tell you more about these other treatments and which ones they recommend and why.

## **Stroke rehabilitation**

One of the most important ways to treat stroke is to help a person recover or adapt to the changes in their brain. That's especially true when it comes to helping them regain abilities they had before the stroke. Stroke rehabilitation is a major part of recovery for most people who have a stroke. That rehabilitation can take many forms, including:

- [Speech therapy](#): This can help you regain language and speaking abilities and improve your ability to control muscles that help you breathe, eat, drink and swallow.
- Physical therapy: This can help you improve or regain the ability to use your hands, arms, feet and legs. This can also help with balance issues, muscle weakness and more.
- Occupational therapy: This can help retrain your brain so you can go about your activities of daily life. This therapy is especially helpful with improving precise hand movements and muscle control.
- Cognitive therapy: This can be helpful if you're having memory problems. It can also help if you have difficulty with activities that require focus or concentration that you could do before.

Other therapies are possible, depending on your case and circumstances. Your healthcare provider is the best person to tell you what kind of treatments can benefit you.

### **Complications/side effects of the treatment**

The side effects of stroke treatments depend greatly on the type of stroke, the treatments used, your medical history and more. Your healthcare provider can tell you more about the side effects you can or should expect and what you can do to manage or even prevent them.

### **How can I take care of myself or manage the symptoms?**

A stroke is a life-threatening medical emergency, and you shouldn't try to self-diagnose or self-treat it. If you have — or someone with you has — stroke symptoms, you should immediately call 911 (or your local emergency services number). The longer it takes for stroke treatment to begin, the greater the risk of permanent brain damage or death.

### **How soon after treatment will I feel better?**

The recovery time and how long it takes to feel better after treatment both depend on many factors. Your healthcare provider is the best person to tell you what you can expect and the likely timeline for your recovery.

## **Prevention**

### **How can I reduce my risk of having a stroke or prevent them entirely?**



There are many things you can do to reduce your risk of having a stroke. While this doesn't mean you can prevent a stroke, it can lower your risk. Actions you can take include:

- Improve your lifestyle. Eating a healthy diet and adding exercise to your daily routine can improve your health. You should also make sure to get enough sleep (the recommended amount is seven to eight hours).
- Avoid risky lifestyle choices or make changes to your behaviors. Smoking and tobacco use, including vaping, recreational drug use or prescription drug misuse, and alcohol misuse can all increase your risk of having a stroke. It's important to stop these or never start them. If you struggle with any of these, talking to your healthcare provider is important. Your provider can offer you guidance and resources that can help you change your lifestyle to avoid these behaviors.
- Manage your health conditions and risk factors. There are several conditions, such as obesity, abnormal heart rhythms, sleep apnea, high blood pressure, Type 2 diabetes or high cholesterol, which can increase your risk of having an ischemic stroke. If you have one or more of these conditions, it's very important that you do what you can to manage them, especially by taking medications — such as blood thinners — as prescribed by your provider. Doing that earlier in life can you avoid severe stroke-related problems later in life.
- See your primary care provider for a checkup or wellness visit annually. Yearly wellness visits can detect health problems — especially ones that contribute to having a stroke — long before you feel any symptoms.

## **Is there anything I shouldn't eat or drink with this condition?**

If you're at risk for any kind of stroke, your healthcare provider may [recommend changing your diet to avoid increases in blood pressure](#). Examples of this include:

- Beverages that contain caffeine, such as coffee, tea, soft drinks, etc.
- Foods that contain a lot of salt or sodium, which can increase blood pressure.
- Foods that are high in saturated fats, such as fried foods, etc.
- Alcohol or recreational stimulant drugs (cocaine, amphetamines/methamphetamine, etc.).

## **Outlook / Prognosis**

### **What can I expect if I have this condition?**

If you have a stroke, many factors affect what you can expect, such as how big it is and where it is in your brain. There are also some key differences between ischemic and hemorrhagic strokes.

## **Ischemic strokes**

In general, the more severe an ischemic stroke is, the worse the damage. When brain damage is more severe, it's more likely that you'll lose certain abilities, at least temporarily. The faster you get medical attention for stroke symptoms, the better your chances that these effects are temporary or less severe.

## **Hemorrhagic stroke**

These strokes usually cause much worse symptoms, especially when bleeding is more severe. The symptoms of hemorrhagic stroke tend to get worse quickly. People with hemorrhagic strokes tend to cause severe headaches, seizures and coma.

## **How long does a stroke last?**

A stroke lasts as long as there's a lack of blood flow to part of your brain. Without treatment, a stroke will continue until the brain cells in the affected areas of your brain die, causing permanent damage.

Even after you receive treatment for a stroke, it's common for the effects to linger. Most people will take weeks or even months to recover. Most of the progress in recovery happens within the first six months to 18 months (approximately) after a stroke. Further progress is possible after that, but can be harder to achieve or take longer.

## **When can I go back to work or school?**

Your healthcare provider is the best person to tell you when you can return to your usual routine and activities. But it's important not to push yourself too hard. Without enough time to recover, you could cause another stroke or other complications.

## **What's the outlook for this condition?**

Strokes have the potential to cause death when they're severe or if they go too long without treatment. However, the outlook can still vary widely depending on many factors. Those factors include where in your brain a stroke happens, how severe it is, your health history and more.

Your healthcare provider is the best person to tell you more about the outlook for your situation. The information they provide will be the most accurate and most relevant information that you can get.

# **Living With**

## **How do I take care of myself?**

If you have a stroke, your healthcare provider will talk with you about a plan for treatment and the timeline for your recovery. They may also prescribe medications, recommend therapy options and more. It's important to talk with your healthcare provider about why they recommend these and what they can do for you.

Once you and your provider finalize the treatment plan, it's very important that you follow it as closely as possible. Doing that will give you the best chance to maximize how much you recover. Other things you can do include:

- Take your medication. Medications that you take after a stroke can prevent having another.
- Go to rehabilitation/therapy appointments. These appointments are critical to your recovery. Going to these appointments and putting in your best effort can make a big difference in how much you recover from a stroke.
- Take care of your mental health. Depression and anxiety are extremely common after having a stroke. Experiencing these doesn't mean you're weak or hopeless, but letting them go untreated can make it harder for you to recover. Talk to your healthcare provider about these feelings if you have them. They can recommend care that can help keep mental health concerns from standing in the way of your recovery.
- Make recommended lifestyle changes as best you can. Health concerns like your blood pressure, blood sugar and cholesterol can all play a role in your recovery from a stroke. Managing these can also help you avoid another stroke in the future. If you use tobacco products (including vaping products) of any kind, quitting them can also help greatly.

## **When should I see my healthcare provider?**

You should see your healthcare provider as recommended. You should also see them if you notice any new symptoms affecting you, especially symptoms that might have a connection to your previous stroke. Even symptoms that don't seem connected might be important, so don't wait to discuss them with your healthcare provider.