

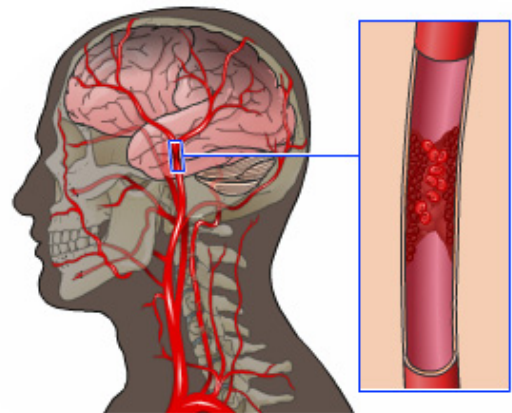
Introduction

A stroke or “brain attack” is a serious condition that can result in death and disability. This disease is a leading cause of death and a common cause of adult disability around the world.

This reference summary explains what strokes are. It discusses their causes and signs and when to go to the emergency room. You will also learn about treatment options and hospital discharge instructions, as well as tips for preventing strokes.

What Is a Stroke?

The brain controls most functions of the body. It allows us to think, understand, speak, move and feel. To work correctly, the brain constantly needs oxygen and glucose. Oxygen and glucose are carried to the brain in the blood.



A stroke happens when blood is not able to reach the brain. When the brain does not receive its needed blood supply, brain cells begin to die and the brain can't function correctly. Since the brain controls most functions of the body, a stroke can affect the entire body. The effects of a stroke range from mild to severe. A stroke can cause paralysis, problems with thinking and speaking and emotional problems such as depression or Pseudo-bulbar affect (PBA). Pseudo-bulbar affect, or PBA, involves emotional outbursts that don't match the situation. The person could have a fit of laughter at a funeral or begin crying at a joke. The person cannot control these reactions.

A transient ischemic attack, or TIA, is like a short lived stroke that gets better on its own in less than 24 hours. It happens when an artery that goes to the brain is temporarily blocked. This causes stroke-like symptoms that last from a few seconds to a few hours.

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There are two types of stroke. The first type is an ischemic stroke. An ischemic stroke can happen when a blood vessel gets blocked.

The blood vessel can become blocked by:

1. A fatty deposit on the artery wall called plaque. This can narrow and block the blood vessel.
2. A blood clot in the artery wall called a thrombus.
3. A small blood clot or plaque called an embolus. An embolus detaches from a bigger artery and flows downstream, blocking a smaller artery.

The second type of stroke is called a hemorrhagic stroke. A hemorrhagic stroke happens when a blood vessel in the brain breaks. This causes blood to leak into the brain, killing cells and preventing other cells from receiving blood they need to stay alive.

Causes

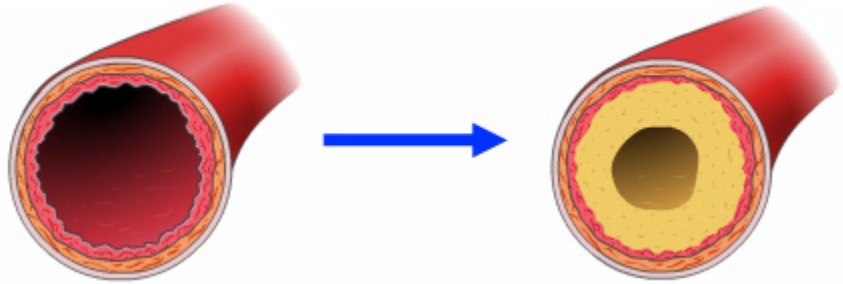
Strokes may be caused by heart problems, high cholesterol or a build-up of plaque in the arteries. They can also be caused by high blood pressure and diseases that cause blood to clot more easily than usual.

Cholesterol can build up and clog the carotid and the vertebral arteries with fatty deposits, or plaque. This can lead to decreased blood flow to the brain and cause strokes.

Parts of the plaque can also get dislodged and move through the arteries to the brain. This clogs smaller arteries, which also leads to strokes. This is known as an embolus.

Heart problems can cause blood clots to form inside the heart. Some of these clots can get dislodged and move to the brain, blocking blood vessels in the brain and causing strokes. This is also known as an embolus. When a blood clot forms inside a blood vessel in the brain or neck, it is called thrombosis.

When a person has high blood pressure, or hypertension, for a long time, blood vessels in the brain can become damaged. Hypertension can cause the blood vessels to narrow. This could lead to a stroke. When arteries become narrow, it is called stenosis.

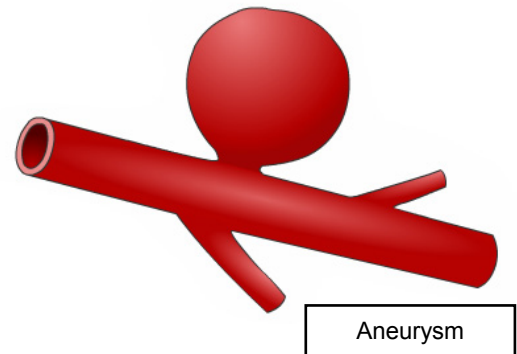


High blood pressure can also make blood vessels become weak, which could cause bleeding inside the brain.

Smoking and drug abuse increase the chances of blood vessel problems and strokes.

Abnormalities in the blood vessels of the brain can also lead to bleeding. Such abnormalities include aneurysms and arteriovenous malformations, or AVMs.

Aneurysms are small, balloon-shaped deformities of the arteries of the brain. AVMs are abnormal connections between the arteries and the veins in the brain. The walls of both aneurysms and AVMs are weaker than normal arteries and can bleed easily, leading to a stroke.



To reduce your risk of death or disability from stroke, you should:

1. Be able to recognize the warning signs of a stroke so you can seek immediate treatment.
2. Change certain lifestyle habits that damage the blood vessels of the body.

Both of these measures will be discussed in the next section.

Signs

To reduce your risk of death or disability from a stroke, learn to recognize the warning signs of a stroke so you can seek immediate treatment.

The symptoms of stroke usually happen quickly. Act FAST if you notice the following signs of a stroke:

- F stands for face – numbness or weakness of the face, especially on one side of the body.
- A stands for arms – arm weakness or numbness, especially on one side of the body.
- S stands for speech – trouble speaking or understanding speech.
- T stands for time – every second counts. Call 911 right away if you notice any of these signs.

Some other signs of a stroke are trouble seeing, dizziness, loss of balance and coordination and a sudden and severe headache.

Sometimes the warning signs may only last a few moments and then disappear. These are known as transient ischemic attacks, or TIAs. Even if they last for a short period and your symptoms resolve, you should not ignore them. You should check with your doctor.

If not treated, TIAs can be followed by strokes, which can cause permanent disability. Severe strokes can lead to coma or death.

Emergency

Stroke is a medical emergency, so learn to recognize signs and symptoms of stroke. Do not ignore the signs of stroke, even if they go away.

Check the time. When did the first symptom start?



If you or someone with you has one or more signs or symptoms of stroke, take action. Immediately call 9-1-1 or the emergency medical services. Treatment can be more effective if it's given quickly. Every minute counts.

If you cannot access 9-1-1 or the emergency medical services, have someone drive you to the nearest hospital emergency room right away.



Treatment

Ischemic stroke is the most common type of stroke, and can be treated with a drug called alteplase that dissolves blood clots that are stopping blood flow to the brain. To be evaluated and receive treatment, it is very important to get to the hospital quickly.

If a stroke or TIA occurs, here are the most important things to remember:

- Do not ignore signs of stroke, even if they go away.
- Check the time. When did the first symptom start?
- If one or more stroke symptoms are present, and last more than a few minutes, do not wait. Call 9-1-1 immediately.

In the hospital emergency room, tests will determine if a TIA, a stroke or another medical problem caused the symptoms. Treatment for a stroke will be different if an artery is blocked or a blood vessel has ruptured.

Your health care provider may use an arteriogram to look for blood clots blocking the blood vessels. If a blood clot is found, emergency surgery may be needed to restore blood flow. This is called a thrombectomy. The surgeon will make a long incision in the blood vessel and remove the clot.

You may be given a blood thinner before the surgery. Afterwards, your health care providers will keep your blood pressure close to what it was before surgery to reduce your risk of clots.

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At the hospital, you may be given a prescription for aspirin or blood thinners to help prevent clots from forming. Some blood thinners are also called antiplatelet medications. When you take blood thinners, you may need regular blood tests. You might also be given prescriptions for other medications when you're at the hospital. These may include medicine for high blood pressure, high cholesterol, heart problems and diabetes.



At the hospital, your healthcare team will discuss the following with you:

- If you smoke, why you should stop smoking
- What you should be eating or drinking for your health after discharge
- Any equipment that you may need to help you move around
- The stroke support groups in the community
- Other medical appointments you may need with a physical therapist, occupational therapist or speech therapist
- The importance of going to follow-up visits with your doctor

Before leaving the hospital, make sure to ask any questions you have about your diagnosis and treatment options.

Prevention

Preventing strokes is much easier than treating them after they happen. You can also prevent strokes from happening again if you've already had one. This section discusses how to prevent strokes. There are certain factors that increase your chances of having a stroke. These are called stroke risk factors. Risk factors are different for everyone. Some risk factors of stroke are things you cannot change. These include factors, such as age, gender and race. For example, an older person generally has more of a risk of having a stroke than a younger person.

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Other risk factors of stroke are things you can change. You can reduce your chances of having a stroke by controlling:

- High blood pressure
- High cholesterol
- Diabetes
- Smoking and drinking habits
- Weight and activity level

It is important to work closely with your healthcare providers to control the risk factors you are able to. Making healthy changes to your lifestyle could help decrease your chance of having a stroke.



Controlling High Blood Pressure

High blood pressure is also called hypertension. This is the most important factor that causes strokes. It is best to try to keep your blood pressure less than 120/80 mmHg. Your health care provider may prescribe medication if your blood pressure is too high.

In people with high blood pressure, artery walls are narrower than usual, increasing the chances of a stroke.

Here are some ways you can control your blood pressure.

- Maintain proper body weight and avoid obesity.
- Avoid drugs known to raise blood pressure. Such drugs may be found in herbal supplements or over-the-counter medications for allergies and colds.
- Cut down on salt.
- Eat fruits and vegetables.
- Exercise frequently under the supervision of your doctor.
- Take any blood pressure medication prescribed by your doctor.



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Controlling blood pressure will also help you avoid heart disease and kidney failure.

Controlling Cholesterol

Cholesterol is a fatty substance in the body. Cholesterol can deposit in the walls of blood vessels and block them. This condition is called atherosclerosis. Atherosclerosis causes heart disease. Heart disease is the number one cause of death in the world. Heart disease causes many complications. By controlling your cholesterol, you improve the health of the blood vessels in your heart and brain. When the blood vessels of your heart are healthy, it is less likely that a stroke will occur because of an embolism.

Your health care provider will help you determine your risk of stroke based on your cholesterol levels, age, previous history of strokes and other risk factors.

You can lower your blood cholesterol by

- Eating a healthy diet
- Exercising and losing weight, if you are overweight
- Taking cholesterol lowering medications

Cholesterol lowering medications are recommended for patients based on their cholesterol levels, overall health and risk of heart problems or stroke.

Blood thinners or other medications may be given to patients who have heart problems. Surgery to open the arteries of the neck may be necessary to prevent strokes. Surgeons can remove plaque through an incision in the neck, called carotid endarterectomy.



Carotid angioplasty and stenting is another way to open the blocked artery. The surgeon travels from an artery in the groin all the way up to the neck. They then inflate a balloon to open the narrowed part of the artery in the neck. They may insert a device called a stent to keep the artery open.

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Smoking Cessation

Cigarette smoking has been linked to the buildup of fatty substances in the carotid artery. The blockage of this artery is one of the main causes of strokes.

Scientists believe that smoking damages the inner lining of the arteries, which causes fatty substances to deposit and block the artery. The nicotine in cigarettes and other tobacco products raises blood pressure.

Cigarette smoke makes the blood thicker and more likely to clot. If you have diabetes, heartbeat or blood clot problems, managing these medical conditions can help you reduce your chance of stroke.

See your doctor and follow his or her advice regarding how to manage these conditions.



Summary

A stroke happens when blood is not able to reach the brain. When the brain does not receive its needed blood supply, brain cells begin to die and the brain can't function correctly.

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.



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Transient ischemic attacks, or TIAs, occur when the blood supply to the brain is briefly interrupted.

Strokes may be caused by heart problems, high cholesterol or a build-up of plaque in the arteries. They can also be caused by high blood pressure and diseases that cause blood to clot more easily than usual.

Act FAST if you notice the following signs of a stroke:

- F stands for face – numbness or weakness of the face, especially on one side of the body.
- A stands for arms – arm weakness or numbness, especially on one side of the body.
- S stands for speech – trouble speaking or understanding speech.
- T stands for time – every second counts.

Some other signs of a stroke are trouble seeing, dizziness, loss of balance and coordination and a sudden and severe headache.

If a stroke or TIA occurs, here are the most important things to remember:

- Do not ignore signs of stroke, even if they go away.
- Check the time. When did the first symptom start?
- If one or more stroke symptoms are present, and last more than a few minutes, do not wait. Call 9-1-1 immediately.

You can reduce your chances of having a stroke by controlling:

- High blood pressure.
- High cholesterol.
- Diabetes.
- Smoking and drinking habits.
- Weight and activity level.

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