

Carotid artery disease

Stroke Helpline: 0303 3033 100
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This guide explains what happens when you are diagnosed with narrowing of the blood vessels in your neck (carotid artery disease), and treatments to reduce your risk of a stroke.

What is carotid artery disease?

Carotid artery disease happens in the blood vessels in your neck taking blood to the brain (arteries). It means that the arteries have become narrowed, stiff and clogged with fatty material. This is called atherosclerosis.

To find out more about atherosclerosis, see 'How does carotid artery disease happen?' on **page 5**.

Carotid artery disease can cause a stroke due to a blockage in the brain, also known as an ischaemic stroke. The blockage cuts off the blood supply to part of the brain, killing brain cells. The effects of a stroke depend on where it takes place in the brain, and how big the damaged area is.

Carotid artery disease can also cause a transient ischaemic attack (TIA or mini-stroke). A TIA is the same as a stroke, but the symptoms last a short amount of time. To find out more about the effects of stroke visit stroke.org.uk/effects-of-stroke.

How can carotid artery disease cause a stroke or TIA?

Carotid artery disease can lead to a clot in the blood vessels in the neck. This can cause a stroke in one of two ways:

1. A clot blocks the carotid artery, cutting off the blood supply to the brain and causing a stroke. This is known as occlusion.
2. A clot can break off inside the artery, and travel to the brain. This is known as thrombosis.

Carotid artery disease is a common cause of stroke, and up to 15% of all ischaemic strokes in the UK may be due to this condition.

It's usually discovered after you have a stroke or transient ischaemic attack (TIA or mini-stroke). To reduce your risk of another stroke or TIA, you might need a surgical procedure to repair the blood vessels.

What is the carotid artery?

The carotid arteries take blood to the brain, face and neck. You have two carotid arteries, one on each side. One branch of the artery reaches the face and scalp, and the other branch travels inside the neck up to the brain.

How is carotid artery disease diagnosed?

Carotid artery disease is usually diagnosed when you have a stroke or a TIA. You have scans and checks to find out what caused your stroke, and if your carotid arteries are narrowed you will be offered treatment to reduce your risk of another stroke.

Scans used to look for carotid artery disease

- Specialist ultrasound: a Doppler or duplex ultrasound scan can show if the blood flow through the artery has been affected by narrowing.

Other scans may be used to find out more detail about the blood vessels, including:

- Computed tomography (CT) scan.
- Computed tomography angiography (CTA), which uses a contrast agent (also called a dye) injected into a vein in your arm to allow the blood vessels to show up on screen.
- Magnetic resonance angiography (MRA) also uses a contrast or dye.

Treatment options

Carotid artery disease can be treated using surgery or medication and lifestyle changes. The treatment you're offered depends on your individual risk of having another stroke.

Surgery

You'll only be offered a procedure if doctors think it will substantially reduce your risk of having another stroke. If the artery is narrowed by over 50% (also known as moderate to severe stenosis) and doctors think you have a high risk of another stroke, you may be offered a surgical procedure to repair the artery. This should be carried out as soon as possible after your stroke or TIA.

Your personal risk of a stroke depend on things like how narrowed your arteries are, if you've had a previous stroke, your age and other health conditions you might have. Your doctor will assess you to help decide what treatment you need. They should help you understand your treatment and what you need to do. See below for more information about each type of surgery and complications.

Other treatment options

If your artery is less than 50% narrowed, your medical team may decide that you will benefit from other types of treatment.

Medication can be very effective in reducing your risk of a stroke. For example, blood-thinning medication can reduce the risk of another clot forming, and medication for high blood pressure and high cholesterol can reduce the build-up of fatty materials in your arteries. You'll be given advice about how to make healthy lifestyle changes too.

Surgical procedures for carotid artery disease

There are two main surgical procedures for carotid artery disease:

- Carotid endarterectomy.
- Carotid artery stenting.

Carotid endarterectomy

Carotid endarterectomy is an operation to remove the inner lining of your artery. It can be done under local or general anaesthetic. The operation takes around one to two hours.

What happens in the procedure?

1. The carotid artery is clamped shut.
2. Sometimes a shunt (small piece of tubing) is used to re-route the blood flow to the brain during the operation.
3. The artery is opened up, and the lining removed along with the fatty deposits.
4. The artery is closed with stitches, or using an artificial patch or graft from another blood vessel.
5. The skin is stitched up, leaving a fine scar of about 7-10cm.

Recovery

Many people can leave hospital after 48 hours. Your surgeon will give you advice about when you can go back to your usual activities or re-start work. This includes avoiding physical activity or exercise for a few weeks, to allow the wound time to heal.

If both of your carotid arteries need surgery, this is usually done in separate operations.

If you smoke you will be advised to stop smoking before the operation. Smoking reduces the amount of oxygen in your blood and can increase your risk of breathing problems during the procedure or getting a chest infection.

Driving

You can't drive until you have recovered enough to perform an emergency stop safely and look over your shoulder. This can take a few weeks. Always ask your GP for individual advice.

Remember that you can't drive for one month after a stroke or TIA. Depending on the type of stroke you had and the kind of driving licence you hold, this period can be longer. For more information read our guide 'Driving after stroke' or visit stroke.org.uk/driving.

What are the risks?

Like all operations, carotid endarterectomy has some risks attached, including some minor and more serious complications.

Complications are more likely if you are older, a smoker, or have had a recent stroke. You can also be more at risk of complications if you have a blockage in both carotid arteries, and if you have other health conditions such as heart disease and high blood pressure.

Serious complications

There is about a 2% risk of having a stroke during surgery, due to the chance of a small blood clot developing during the operation and travelling to your brain. The risk may be higher if you have had a stroke before the operation.

The risk of dying is about 1%, usually due to a complication such as a severe stroke or heart attack soon after the operation.

Other complications

- Wound infection affects less than 1% of people, and can be treated with antibiotics.
- Bleeding from the site of your wound.
- Nerve injury affects around 4% of people and is usually temporary. This can cause a hoarse voice, weakness, or numbness on one side of your face. These symptoms usually disappear within a month.
- Numbness or slight pain around your wound, which can be treated with painkillers.
- The arteries becoming blocked again. Up to 4% of people will need to have further surgery.

Ask your doctor to help you understand your individual risk, and the benefits of the operation. See 'Understanding your options' below.

Carotid artery stent placement (stenting)

Stenting uses a mesh cylinder to keep the artery open. Unlike endarterectomy, it doesn't involve opening up the neck. It's done under local anaesthetic.

What happens in the procedure?

1. A thin, flexible tube goes into the artery in your groin, and is passed up the neck.
2. The tube is guided through your arteries using a live X-ray. You're injected with a contrast (also known as dye) so the arteries show up on the screen.
3. When the tube reaches the neck, a tiny balloon is inflated in the carotid artery.
4. The stent (a mesh cylinder) goes into the balloon and keeps the artery open.
5. The balloon is removed, leaving the stent in place.

Recovery

After the operation you will need to lie flat and still for an hour or so afterwards to prevent bleeding from the artery. Most people can go home the next day.

What are the risks?

As with carotid endarterectomy, complications can occur after stenting. The risk of a stroke or dying due to stenting is slightly higher. It's a less invasive procedure, and is just as effective at reducing strokes in the long term. You will be assessed to help decide which procedure is best for you.

Other complications

- Bruising where the tube enters your femoral artery.
- Bleeding from this point, which may need to be repaired (affects about 1% of all cases).
- An allergic reaction or kidney problems due to the X-ray contrast dye.
- A blockage or rupture in your carotid artery – this is very rare but may need to be treated with a stent. If this isn't possible, an operation may be needed to repair your artery.

Understanding your options

Your doctor should work with you to help you understand why you need the operation, and what the benefits are. They should also explain the risks, and what to expect afterwards.

To help you understand your options, we've put together a question checklist. You can use it when you're speaking to the hospital doctor or your GP. You may want to write down the answers and discuss them with friends or family.

Question checklist: carotid artery disease treatment

1. What is the success rate for this operation at this hospital?
2. Is endarterectomy or stenting best for me, and why?
3. If I don't have the operation, how likely am I to have a stroke?

4. Am I at an increased risk during this operation because I've had a stroke or TIA?
5. Can I choose to have a local or a general anaesthetic?
6. Is it likely that I will have to have this operation again in the future?
7. Do you have a diagram to help explain the operation?

How does carotid artery disease happen?

Carotid artery disease means the arteries in your neck are clogged up and narrowed. This is known as atherosclerosis.

What is atherosclerosis?

Over time, fatty materials in the blood can stick to the lining of the artery walls. These fats combine with other materials such as blood cell fragments. This can build up into a thickened area inside the blood vessel. The build-up is known as atheroma, or plaque.

As atheromas form, the blood vessel becomes more and more stiff and narrow. This process is known as atherosclerosis.

Who can get atherosclerosis?

Our arteries naturally become narrowed as we get older. But some things make it more likely to happen, and there are things you can do to help reduce your risk of a stroke.

Risk factors

Medical conditions like high blood pressure, diabetes and high cholesterol can cause atherosclerosis. It's also more likely to happen to you if it affects a close family member.

Smoking can cause atherosclerosis. Other risk factors include being overweight, not being very active, and eating food with too much fat and salt.

Staying healthy and reducing your risk of a stroke

Atherosclerosis is a gradual process, but there are some things you can do to help slow it down, and reduce your risk of another stroke.

Health conditions

Atherosclerosis is often linked to conditions like high blood pressure, high cholesterol and diabetes. By taking any medication you need for these conditions, you may be able to reduce the build-up of atheroma.

After a stroke you will have advice and treatment to control your blood pressure, blood sugar and cholesterol. You can get support with taking medication from your GP or pharmacist.

We have information on all the health conditions linked to stroke online at stroke.org.uk/are-you-at-risk.

Healthy lifestyle changes

After a stroke, you should have advice and support with making any lifestyle changes you need. This can include help with quitting smoking and support for losing weight. Becoming more active and having a healthy diet can also help you stay healthy and reduce your risk of another stroke.

Getting started with healthy lifestyle changes

Your GP can give you the help and advice you need about healthy lifestyle changes. This could include free support services for quitting smoking and local schemes to help you be more active.

Read our guide 'How to reduce your risk of a stroke' or visit stroke.org.uk/reduce-my-risk.

Where to get help and information

From the Stroke Association

Talk to us

Our Stroke Helpline is for anyone affected by a stroke, including family, friends and carers. The Helpline can give you information and support on any aspect of stroke.

Call us on **0303 3033 100**, from a textphone **18001 0303 3033 100**
Email **helpline@stroke.org.uk**.

Read our information

Get detailed information about stroke online at **stroke.org.uk**, or call the Helpline to ask for printed copies.

My Stroke Guide

The Stroke Association's online tool My Stroke Guide gives you free access to trusted advice, information and support 24/7. My Stroke Guide connects you to our online community, to find out how others manage their recovery.

Log on to **mystrokeguide.com** today.

Other sources of help and information

Circulation Foundation

Website: **circulationfoundation.org.uk**

Tel: **01543 442 194**

Information on carotid artery disease and treatments. Have details of patient support groups and a UK-wide counselling directory.

NHS UK

Website: **nhs.uk**

Provides patient health information, including carotid endarterectomy, for people in England, Wales and Northern Ireland.

NHS Inform website (Scotland)

Website: **nhsinform.co.uk**

Provides health information for the public in Scotland.

Your notes

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About our information

We want to provide the best information for people affected by stroke. That's why we ask stroke survivors and their families, as well as medical experts, to help us put our publications together.

How did we do?

To tell us what you think of this guide, or to request a list of the sources we used to create it, email us at **feedback@stroke.org.uk**.

Accessible formats

Visit our website if you need this information in audio, large print or braille.

Always get individual advice

This guide contains general information about stroke. But if you have a problem, you should get individual advice from a professional such as a GP or pharmacist. Our Helpline can also help you find support. We work very hard to give you the latest facts, but some things change. We don't control the information provided by other organisations or websites.

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Every five minutes, stroke destroys lives. We need your support to help rebuild them. Donate or find out more at **stroke.org.uk**.

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