

Cholesterol and stroke

Stroke Support Helpline: **0303 3033 100**
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This guide is for anyone who wants to know more about cholesterol. It includes information about where cholesterol comes from, how it affects your risk of stroke and what you can do to lower your cholesterol.

This information is for people who have had a stroke or transient ischemic attack (TIA or mini-stroke) or are at risk of having one. For more detailed information about diet and healthy eating, call our Stroke Support Helpline for a copy of '**Your guide to eating well after a stroke**' or visit stroke.org.uk

This guide covers:

- What is cholesterol?
- Why is managing your cholesterol important?
- How is cholesterol measured?
- How to reduce your cholesterol
- Healthy eating tips for reducing your cholesterol.

What is cholesterol?

Cholesterol is an important substance in our bodies. It plays a part in our digestive and hormonal systems but can be harmful if levels get too high. Cholesterol is a fatty substance, called a lipid, which is found naturally in your blood.

High cholesterol is very common. It's thought about one in two adults in the UK have raised cholesterol levels. It's important to check your cholesterol levels. If there's too much cholesterol in your blood it can damage your blood vessels, which may cause heart disease and stroke. But with the right treatment and support with a healthy lifestyle, high cholesterol can usually be treated effectively.

Where does cholesterol come from?

Your body produces most of the cholesterol it needs in the liver. We also consume cholesterol in our diets.

Your liver changes how it processes cholesterol if your diet is high in saturated fats. Excess cholesterol enters your bloodstream and can cause a build-up of fatty deposits in your arteries, which can become narrow and stiff. This is a process called atherosclerosis. The damage to the artery wall can lead to a clot forming, which may travel to the brain and cause a stroke.

Cholesterol and stroke

You do not usually need to avoid eating foods that contain cholesterol, such as eggs or seafood. But you should try to reduce the amount of fat that you eat, especially saturated and trans fats. For more information about fats, read '**Your guide to eating well after a stroke**'.

What are the different types of cholesterol?

Cholesterol moves around the body by attaching itself to proteins in the blood. This combination of cholesterol and protein is called a lipoprotein. There are two types of cholesterol: 'good' cholesterol and 'bad' cholesterol. Each type has an important role and it's important to have the right balance of both in your body.

- **Good cholesterol** – HDL (high density lipoprotein) takes cholesterol away from cells and back to the liver. The cholesterol is then destroyed. Because of this, HDL is known as 'good' cholesterol. You should aim to increase your levels of HDL.
- **Bad cholesterol** – non-HDL or LDL (low density lipoprotein) moves cholesterol to where it's needed in your cells. But if there is too much non-HDL cholesterol in your blood, it can end up as fatty deposits in your arteries. This will increase your risk of stroke. If you've been diagnosed with high cholesterol, it's likely that your LDL is high.

What causes high cholesterol?

For many people, high cholesterol is caused by eating too much saturated fat. Other causes include:

- Being overweight.
- Not being physically active.
- Drinking too much alcohol.
- Smoking.

As well as lifestyle factors, there are other risk factors which may make you more likely to have high cholesterol. These can include:

- **Your sex:** high cholesterol is more common in men, but it also affects women.
- **Your age:** high cholesterol is more likely as you get older.

- **Your ethnic background:** people from South Asian or sub-Saharan African families may be more likely to develop high cholesterol.
- **Menopause:** you may be at increased risk of high cholesterol if you've been through the menopause.
- Having a history of heart disease or high cholesterol in your family.
- Having other health conditions like diabetes or high blood pressure.

Familial hypercholesterolaemia

Some people have high cholesterol because of an inherited genetic condition. This is called familial hypercholesterolaemia (FH). This is when you have a very high level of cholesterol in your blood that is not caused by diet or lifestyle alone.

FH is thought to affect about 1 in 250 people in the UK, but most people don't know they have it. It's important to get diagnosed and start treatment early. Talk to your doctor if you're concerned about FH.

If you have a parent, child or sibling diagnosed with a stroke, heart attack or angina before they are 60, it's very important to have a cholesterol test. Anyone who has a total cholesterol over 7.5mmol/L should have an assessment for FH. Read more about how cholesterol is measured on **page 3**.

You can treat FH with cholesterol-lowering drugs. Lifestyle changes, such as exercising, healthy eating and stopping smoking, can also help manage FH.

What are the symptoms of high cholesterol?

High cholesterol has no noticeable symptoms. You need to have your cholesterol levels checked to find out if you have it. This can be done with a simple blood test – see **page 3**. It's also important to be aware of your own risk factors for high cholesterol.

Why is managing your cholesterol important?

It's important to know if you have high cholesterol. If cholesterol is not managed, it could lead to long-term health problems and increase your risk of stroke or heart attack.

If you've had a stroke or transient ischaemic attack (TIA), you will be assessed and may be offered cholesterol treatment, regardless of what your cholesterol level is. This is because any reduction in your cholesterol may help prevent another stroke. You should also be given advice and support with lifestyle measures, such as eating more healthily and quitting smoking.

How is cholesterol measured?

Cholesterol levels are checked with one of the following types of blood test:

- **A full lipid profile test:** Some blood is taken from your arm with a needle. The blood is sent to a lab and you'll usually get the results in a few days. For some tests, you may be asked not to eat or drink anything for 12-14 hours before, although this is not very common.
- **A finger prick test:** A small drop of blood from your finger is placed on a strip of paper and tested in a machine. You'll get the results straight away.

Ask your GP surgery or a pharmacist about getting your cholesterol checked. They'll talk to you about which test is best for you.

What are normal levels of cholesterol?

Cholesterol is measured in mmol/L, which is the amount of cholesterol per litre of blood.

Generally, your total cholesterol level should be below 5mmol/L, and the level for non-HDL (bad cholesterol) should be below 4mmol/L. These levels are a guide for healthy adults.

However, the options for managing your cholesterol also depend on whether you have had a stroke or heart attack, and what your underlying risk factors are. If you've had a stroke or a heart attack, your doctor will work with you to try to reduce your cholesterol to a level which is safe and healthy for you. National clinical guidelines for people who have already had a stroke suggest you should aim to get your non-HDL cholesterol levels to 2.6mmol/L or less (or your LDL to 2.0mmol/L or less), but your doctor should be able to give you individual advice on your own health and treatment.

How often should I check my cholesterol?

How often you check your cholesterol levels will depend on your age and if you have other health conditions. Your doctor will be able to tell you how often you should have your cholesterol checked, based on your individual situation.

If you're on cholesterol-lowering medication, it's important to get your cholesterol checked at least once a year.

You should contact your GP surgery for a cholesterol test if any of the following applies to you:

- You're over 40.
- You're overweight.
- You have a family history of stroke, high blood pressure or other medical conditions such as heart disease or diabetes.

If you're aged between 40 and 74, live in England and do not have a pre-existing health condition, you should be offered an NHS Health Check every five years. It includes a cholesterol test. Contact your GP surgery if you think you may be eligible but have not been offered a check. Your cholesterol results, along with factors like other health conditions, will help your health professional assess your risk of stroke and heart attack. You may hear this called a 'QRISK score'.

They will talk to you about things you can do to reduce your risk of a stroke or heart attack in the future.

How to reduce your cholesterol

There are different ways to reduce your cholesterol levels. This section describes the different treatments available to help lower cholesterol. It also talks about the changes you can make to your diet. For more detailed information about diet, visit stroke.org.uk/stroke/manage-risk/eat-healthy-diet or call our Stroke Support Helpline for printed information.

If you have high cholesterol, or you're worried about your risk, contact your GP surgery for individual advice. They will be able to suggest things that are suitable for you. What is right for one person will not necessarily be right for someone else.

Drug treatments

Drug treatments can work well at lowering cholesterol levels. Your doctor may suggest you take treatment long-term to help manage your cholesterol. In this section, we talk about the different types of treatments available to help lower cholesterol.

Statins

Statins are the main type of medication given to reduce the risk of stroke and heart attack. If you've had a stroke caused by a clot (ischaemic stroke) or a TIA, your doctor may prescribe statins to help prevent another stroke or TIA. This treatment will usually start before you leave hospital after a stroke. If you were taking statins before your stroke, you should continue to take them unless advised not to by a clinician.

Taking statins may help to reduce your risk of an ischaemic stroke by over 10%. It may also reduce your risk of another stroke by more than 10% in people who have already had an ischaemic stroke.

Statins come as daily tablets. They work by reducing the levels of 'bad' cholesterol produced by the liver. This helps prevent fatty deposits (atherosclerosis) forming on the walls of your arteries and blocking them.

There are many types of statins that your doctor can prescribe. Atorvastatin is usually the first treatment option that will be recommended. Your doctor can talk to you about other statins available and discuss which one is most suitable for you.

Always read the information leaflet which comes with your medication and ask your doctor or pharmacist if you have any questions. They can discuss possible side effects, what dose is suitable for you and how to take your medication.

If you're prescribed statins, your doctor may suggest you make some lifestyle changes too. For example, eating healthily and reducing the amount of alcohol you drink. Your doctor may also refer you to a dietitian who can give you specialist support and information about your diet.

Other lipid-lowering drugs

If you cannot take statins or statins have not worked for you, there are other types of drugs available. Talk to your doctor about whether these medications are suitable for you.

The main alternative to statins is a selective cholesterol absorption inhibitor such as ezetimibe, which comes as a daily tablet. Some people who have had a stroke but cannot take statins or ezetimibe (or whose cholesterol was not lowered sufficiently by these medications) may be prescribed PCSK9 inhibitors, such as evolocumab or alirocumab. They are given by injection every two to four weeks.

There are also some newer medications such as inclisiran and bempedoic acid. They may be offered in combination with other cholesterol-lowering treatments.

Bempedoic acid comes as a daily tablet. Inclisiran is given as an injection. After the initial dose, it's given again after three months, and then every six months.

Other treatments

Plant sterols and stanols are naturally found in foods such as fruit and vegetables, nuts, seeds and vegetable oils. They can help reduce cholesterol in your blood when taken as supplements alongside a healthy diet.

You can buy products such as yoghurts, margarines and mini drinks which contain stanols and sterols. You need to consume about 2-3g of plant sterols each day to lower your cholesterol.

You can use plant sterols and stanols alongside cholesterol-lowering medication. But they should not replace your medication. Although sterols and stanols can reduce cholesterol, they do not reduce your stroke risk in the same way as statins.

Changing your diet

What you eat is linked to your cholesterol levels. For example, eating an unhealthy and unbalanced diet can lead to weight gain. Being overweight or obese can increase your risk of developing health conditions such as high cholesterol.

For tips on how to eat healthily to reduce your cholesterol, see opposite.

Other ways to manage your cholesterol

As well as treatments and diet, there are some lifestyle changes you can make to help lower your cholesterol. These include:

- Being active and exercising.
- Stopping smoking.
- Managing your weight.
- Reducing alcohol.

Healthy eating tips for reducing your cholesterol

Making the following changes to your diet can help to lower your cholesterol:

- Cut down on foods high in saturated fat such as full-fat dairy products, fatty meat, cakes, pastries and biscuits. Also try to reduce foods high in coconut oil, palm oil or ghee.
- Eat foods high in soluble fibre such as oats, beans, peas, pulses, nuts, fruit and vegetables.
- Eat five or more portions of a variety of fruit and vegetables each day.
- Eat oily fish such as salmon, mackerel, sardines, trout or herring. Aim for two portions each week.
- Use olive or rapeseed oil for salad dressings, or an oil that is high in polyunsaturated fats like sunflower oil.
- Try to include soya-based products in your diet, such as tofu, edamame beans, soya milk or soya yogurt.

Cholesterol from eggs, liver, kidneys and some seafoods has little effect on your blood cholesterol levels, unless you eat very large amounts.

If you're worried about your diet or unsure about what foods to eat, talk to your GP surgery. They'll be able to give you advice and support.

You can find more information on eating more healthily at stroke.org.uk/stroke/manage-risk/eat-healthy-diet or call our Stroke Support Helpline for a printed copy.

Where to get help and information

From the Stroke Association

Stroke Support Helpline

Our Stroke Support Helpline offers information and support for anyone affected by stroke, including family, friends and carers.

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

Read our information

Log onto **stroke.org.uk**, where you can find easy-to-understand information, videos and an online community to support you. You can also call the Stroke Support Helpline to ask for printed copies of our guides.

Other useful organisations

Association of UK Dieticians

Website: **bda.uk.com**

Telephone: **0121 200 8080**

Provides factsheets on various aspects of diet and nutrition, including cholesterol.

British Heart Foundation

Website: **bhf.org.uk**

Telephone: **0808 802 1234**

Information and support about heart health and conditions, including a helpline run by cardiac nurses.

Heart UK

Website: **heartuk.org.uk**

Email helpline: **hello@heartuk.org.uk**

Cholesterol charity offering information and support for people affected or worried about high cholesterol, including familial hypercholesterolaemia. Their website features low-cholesterol recipes.

NHS Eat Well guide

Website: **nhs.uk/live-well/eat-well**

Information about eating a healthy, balanced diet.

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 Stroke Support 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.

You know more than most just how shocking and confusing having a stroke is. We're here to support you and your family find the strength and determination to get back to life.

Learn more about stroke support: **stroke.org.uk**

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