

Lowering cholesterol to reduce the risk of coronary heart disease and stroke

Information for the public

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About this information

NICE guidelines provide advice on the care and support that should be offered to people who use health and care services.

This information explains the advice about the care and treatment of people with an increased risk of cardiovascular disease (diseases of the heart or blood vessels that are caused by narrowing of the arteries – for example, heart attack or stroke) that is set out in NICE guideline 181.

This is an update of advice on lowering cholesterol to reduce the risk of heart disease, stroke and peripheral arterial disease that NICE produced in 2008.

Does this information apply to me?

Yes, if you are an adult:

- with or without cardiovascular disease
- with type 1 or type 2 diabetes
- with chronic kidney disease.

No, if you:

- have an inherited form of high cholesterol called familial hypercholesterolaemia, or other inherited conditions that increase your risk of cardiovascular disease
- are having renal replacement therapy (for example, dialysis or kidney transplant).

Cardiovascular disease

Heart disease and stroke are the most common forms of cardiovascular disease. Coronary heart disease is a condition in which the blood vessels in the heart become narrowed or blocked by the build-up of fat. This can result in angina (chest pains) and heart attack. A stroke is when the normal blood supply to part of the brain is cut off, which can damage the area of the brain affected.

Other forms of cardiovascular disease include a 'mini-stroke' (transient ischaemic attack or TIA) and peripheral arterial disease (narrowing of the arteries, usually in the legs).

Cardiovascular disease is the most common cause of death in the UK, and is a major cause of illness, disability and poor quality of life. Smoking, high blood pressure and having high levels of fats, such as cholesterol, in your blood increase your risk of heart disease or stroke. Changing your diet, stopping smoking, reducing your alcohol intake and taking more exercise can lower your cholesterol and help reduce your risk. Medication may be helpful. People with diabetes or chronic kidney disease are also at increased risk of cardiovascular disease.

Your care team

A range of professionals who specialise in different areas of treatment or support may be involved in your care. These could include GPs, pharmacists, nurses, dietitians and consultants.

Working with you

Your care team should talk with you about lowering your cholesterol to reduce the risk of cardiovascular disease. They should explain any tests, treatments or support you should be offered so that you can decide together what is best for you. Your family or carer can be involved in helping to make decisions, but only if you agree.

You may also like to read NICE's information for the public on [Patient experience in adult NHS services](#). This sets out what adults should be able to expect when they use the NHS. We also have more information on the NICE website about [using health and social care services](#).

Some treatments or care described here may not be suitable for you. If you think that your treatment does not match this advice, talk to your care team.

Assessing your risk of cardiovascular disease

Your GP surgery should have a plan to identify people who do not already have cardiovascular disease but who may be at high risk of developing it. They should do this by checking risk factors in medical records such as family history of premature cardiovascular disease. If you are aged over 40, your risk of developing cardiovascular disease should be reviewed on an ongoing basis.

If these checks suggest that you have a 1 in 10 (10%) or greater chance of developing cardiovascular disease in the next 10 years, you should be offered a full risk assessment. Your GP or nurse should discuss this with you.

Having a risk assessment

If you agree to a full risk assessment, your GP or nurse should use the computer program QRISK2 to estimate your risk of developing cardiovascular disease. This will take into account:

- your age
- your sex
- whether you smoke
- your blood pressure
- your cholesterol level.

Some medical conditions or medication can affect your risk score, and your GP should take this into account.

QRISK2 shouldn't be used to assess your risk if:

- you have type 1 diabetes
- you have a GFR (or glomerular filtration rate) less than 60 (this shows how well your kidneys are working)
- you have had cardiovascular disease before

- you have an inherited form of high cholesterol.

Your GP or nurse may take a blood sample to measure your cholesterol levels if these are not already known. If these levels and your family history suggest that you have an inherited form of high cholesterol, you may need more tests or referral for specialist care. Any other possible causes (such as excess alcohol or uncontrolled diabetes) should be ruled out before you are referred to a specialist.

See [Other NICE guidance](#) for details of our guidance on inherited high cholesterol in the family (familial hypercholesterolaemia).

Discussing your risk of cardiovascular disease

Your GP or nurse should consider all the factors that affect your risk. They should weigh you and measure your height and ask you whether you are taking any drugs to lower your blood pressure. They should explain your risk of developing cardiovascular disease over the next 10 years, and what could help to reduce that risk. They should also tell you about any possible side effects of drug treatment. The information they give you should include written information to help you understand your risk.

Your GP or nurse should ask you what you already know about your risk and how you feel about it. They should discuss with you the benefits of making changes to your lifestyle (for example, stopping smoking, changing your diet, taking more exercise or drinking less alcohol). They should also ask you whether you would agree to have tests and treatments if needed. Your GP or nurse should make sure you understand what has been discussed and give you the opportunity to ask any questions.

Your GP or nurse should work with you to develop a personal plan for reducing your risk of cardiovascular disease. They may discuss with you the option of taking a type of drug called a statin to reduce your cholesterol.

If you decide not to have any treatment, your GP or nurse should advise you to have your risk assessed again in the future. They should record your decision in your medical notes.

Questions you might like to ask your care team

Can you explain to me what heart attack and stroke are?

Can you explain more about my risk of having a heart attack or stroke?

Can you help me understand what the risk might mean to me?

Do I have to accept a risk assessment?

Are there any support organisations nationally or in my local area?

What types of support might I get to help me have a more healthy lifestyle?

Making changes to your lifestyle

If you are at high risk of developing cardiovascular disease, or you have already had heart disease or a stroke, your GP or nurse should suggest ways to help you achieve a healthy lifestyle. You can also find information to help you at the [NHS Choices](#) website.

Stopping smoking

If you smoke, your GP, nurse or pharmacist should advise you to stop. If you decide you want to stop, they should give you support and advice. They should offer to refer you to a support service, such as the NHS Stop Smoking Services. However, if you can't or don't want to use this, you may be offered medication or nicotine replacement therapy instead.

See [Other NICE guidance](#) for details of our guidance on smoking.

Eating a healthy diet

Your GP or nurse should advise and support you to eat a healthy diet that helps protect your heart. They should take into account your individual circumstances when giving you advice. Healthy eating can include:

- Eating less fat. Avoid foods that contain a lot of fat, such as fried or processed foods or takeaways.
- Avoiding, in particular, a lot of saturated fat (for example, fatty meat, butter and cheese). Try to choose foods containing mono-unsaturated fats (such as olive oil and rapeseed oil) and polyunsaturated fats (such as corn oil and sunflower oil) instead.

- Reducing your intake of sugar and of food products (such as cakes and processed meats) that contain refined sugars.
- Choosing healthy ways of cooking and preparing your food. Don't fry food or roast food in fat such as butter or ghee. Instead, steam, poach, bake, casserole or microwave. Add flavour using spices, herbs and lemon juice instead of using buttery, cheesy or creamy sauces, which tend to be high in fat.
- Choosing wholegrain varieties of starchy food (for example, wholegrain rice and pasta).
- Eating at least 5 portions of fruit and vegetables a day. A portion is about 80 g (for example, an apple or 3 heaped tablespoons of peas).
- Eating at least 2 portions of fish a week, including a portion of oily fish (such as herrings, sardines, mackerel or salmon). A portion is about 140 g (a fillet of fresh fish or a small tin). If you are pregnant you should eat no more than 2 portions of oily fish a week and avoid marlin, shark and swordfish.
- Eating at least 4 to 5 portions of unsalted nuts, seeds and legumes (such as peas and beans) a week.

Getting enough exercise

Your GP or nurse should recommend that you take 150 minutes of moderate exercise or 75 minutes of vigorous exercise a week, or a mix of these. Examples of moderate exercise that you could include in your daily life are walking briskly, climbing stairs and cycling. If you can't do moderate exercise, for example because of health problems, you should try to do as much as you can safely. Running is an example of vigorous exercise.

You should also be advised to do muscle-strengthening exercises on 2 or more days a week that work all the main muscle groups (legs, hips, back, abdomen, chest, shoulders and arms).

Your GP or nurse should agree your exercise goals with you, taking into account your preferences and what you are able to do. They should give you written information about the benefits of exercise and about local opportunities to be active. These might include sports or cycling clubs, dancing classes, swimming pools or gyms.

See [Other NICE guidance](#) for details of our guidance on physical activity.

Becoming a healthy weight

If you are overweight, your GP or nurse should offer you advice and support to lose weight and keep it off. Even reducing your weight a little (by 5–10%, or 5–10 kg if you weigh 100 kg) can have big benefits.

See [Other NICE guidance](#) for details of our guidance on obesity.

Reducing your drinking

Your GP or nurse should advise you to limit the amount of alcohol that you drink.

- Don't binge drink or drink more than the total recommended for men or women per week.
- Women should have no more than 2–3 units of alcohol a day.
- Men should have no more than 3–4 units of alcohol a day.

A unit is about half a pint of normal strength beer, lager or cider, or a pub measure of spirits. A medium-sized glass of wine is about 2 units.

Food products to help reduce cholesterol

If you are at high risk of cardiovascular disease, your GP or nurse should not recommend that you use spreads, drinks and yoghurts containing substances derived from plants, called sterols and stanols, to lower cholesterol because there is not enough evidence at the moment that these products help to prevent cardiovascular disease. Similarly, there is no evidence that omega-3 fatty acid compounds (such as fish oil supplements) help to reduce the risk of cardiovascular disease.

Drug treatments to lower your cholesterol

Statins

Your doctor may think that you would benefit from statin treatment to reduce your risk of cardiovascular disease. When making this decision, they should discuss the benefits and risks of statins with you. The discussion should include the potential benefits of any lifestyle changes, other medical conditions you may have and your own preference. If you have established heart disease or have had a stroke, you should consider taking a statin as soon as possible.

Before you start statin treatment, your GP or nurse should check:

- whether you smoke
- how much alcohol you drink
- your blood pressure
- whether you are a healthy weight
- the levels of glucose (sugar), fat and the different types of cholesterol in your blood
- the levels of thyroid hormones in your blood
- whether you have had any persistent muscle pain that can't be explained.

They should take a blood sample to check how well your kidneys and liver are working. Your liver function should also be measured within 3 months of starting treatment and then a year later.

If you are pregnant

You should not take statins if you are pregnant because they can harm the unborn child. If you think you might be pregnant, you should stop taking them. If you are planning to get pregnant, you should stop taking them 3 months before you try and conceive and not take them again until you have finished breastfeeding.

Which type of statin

No previous cardiovascular disease

If you have not had cardiovascular disease before, it is important that any other factors that may affect your risk of cardiovascular disease (for example, smoking or excessive alcohol intake) are addressed before you are offered statin treatment. Your GP or nurse should also discuss the benefits of changing your lifestyle with you, and refer you to programmes to help you with this (such as stop smoking or diet and exercise programmes) if needed. See [Other NICE guidance](#) for details of our guidance on behaviour change. After you have tried to change your lifestyle, you should be offered another risk assessment to see if statin treatment would help you. If your GP thinks you would benefit, they should offer you treatment with atorvastatin to help reduce your cholesterol. Atorvastatin is one of several types of statin.

Previous cardiovascular disease

If you already have cardiovascular disease, you should usually be offered atorvastatin. Your doctor should discuss with you the most appropriate dose depending on your circumstances. For example, you may be offered a lower dose if the statin is likely to interact with any other drugs you are taking or it could cause you problems, or if you would prefer to take a lower dose.

Type 1 diabetes, type 2 diabetes or chronic kidney disease

If you have type 1 diabetes, you may be offered treatment with atorvastatin to help reduce your risk of cardiovascular disease: for example, if you are over 40, have had diabetes for more than 10 years, or have kidney disease or other conditions that increase your risk.

If you have type 2 diabetes and a 1 in 10 (10%) or greater risk of developing cardiovascular disease in the next 10 years, you should be offered treatment with atorvastatin.

If you have chronic kidney disease, you should also be offered atorvastatin.

Checking the statin is working

Your GP or nurse should measure your cholesterol levels after you start treatment to check whether the statin is working. If your cholesterol level has not decreased enough, your GP should work with you to address this. It is important that you take the statin as prescribed, so they may ask you whether you are taking the statin regularly. It may help some people to change to a higher dose. They may also ask you about your diet and lifestyle.

If you are taking a statin, you should have a medication review every year. Your GP should discuss with you your lifestyle changes, check that you aren't having any problems taking your statin, and address any conditions that could increase your risk of cardiovascular disease. If you have been taking a statin for a while and aren't having any problems with it, your GP may talk to you about the possible benefits and risks of changing to a higher dose if needed.

You shouldn't be offered vitamin D or coenzyme Q10 to take with your statin.

Advice when taking statins

Your GP or pharmacist should advise you that other drugs, some foods (for example, grapefruit juice) and some supplements may interfere with statins. If you are starting other drugs or thinking

about taking supplements, you should always read the patient information leaflet or talk to a pharmacist first.

Problems when taking statins

All medicines can cause side effects, which are listed in the patient information leaflet. If your statin is causing you problems, your GP may ask you to stop taking it for a while to check whether your symptoms are related to the statin. Your GP may discuss reducing the dose with you or changing to a different statin.

If you have tried 3 different statins but they are all causing you problems, and you have cardiovascular disease, chronic kidney disease, diabetes or inherited forms of high cholesterol, your GP may refer you to a specialist.

Serious problems with statins are very rare. However, your GP, nurse or pharmacist should tell you to watch out for pain, tenderness or weakness in your muscles while taking a statin. If these occur, you should let your GP or nurse know.

Questions you may want to ask about statins

- Can you tell me why you have decided to offer me this particular type of treatment?
- How will the treatment help me? How much will it reduce my risk by?
- What will happen if I decide I do not want to take the treatment? Are there other options?
- Are there any risks associated with this treatment?
- What should I do if I get any side effects? (For example, should I call my GP, or go to the emergency department at a hospital?)

Other drugs

Statins are unsuitable for some people, for example if side effects are too troublesome. If statins are not suitable for you, you may be offered an alternative drug called ezetimibe.

See [Other NICE guidance](#) for details of our guidance on ezetimibe.

You shouldn't normally be offered fibrates, and you shouldn't be offered nicotinic acid or anion exchange resins, which also lower cholesterol, to reduce the risk of cardiovascular disease.

Sources of advice and support

- British Heart Foundation, 0300 330 3311
www.bhf.org.uk
- HEART UK – The Cholesterol Charity, 0845 450 5988
<http://heartuk.org.uk>
- The Stroke Association, 0303 3033 100
www.stroke.org.uk
- South Asian Health Foundation (SAHF), 020 331 30670
www.sahf.org.uk

You can also go to [NHS Choices](#) for more information.

NICE is not responsible for the quality or accuracy of any information or advice provided by these organisations.

Other NICE guidance

- [Behaviour change: individual approaches](#). NICE public health guidance 49 (2014).
- [Patient experience in adult NHS services](#). NICE clinical guidance 138 (2012).
- [Hypertension: clinical management of primary hypertension in adults](#). NICE clinical guideline 127 (2011).
- [Familial hypercholesterolaemia: identification and management of familial hypercholesterolaemia](#). NICE clinical guideline 71 (2008).
- [Smoking cessation services in primary care, pharmacies, local authorities and workplaces, particularly for manual working groups, pregnant women and hard to reach communities](#). NICE public health guidance 10 (2008).
- [Behaviour change: the principles of effective interventions](#). (NICE public health guidance 6 (2007)).
- [Ezetimibe for the treatment of primary \(heterozygous-familial and non-familial\) hypercholesterolaemia](#). NICE technology appraisal guidance 132 (2007).
- [Varenicline for smoking cessation](#). NICE technology appraisal guidance 123 (2007).

- Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children. NICE clinical guideline 43 (2006).
- Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling. NICE public health intervention guidance 2 (2006).

Accreditation

