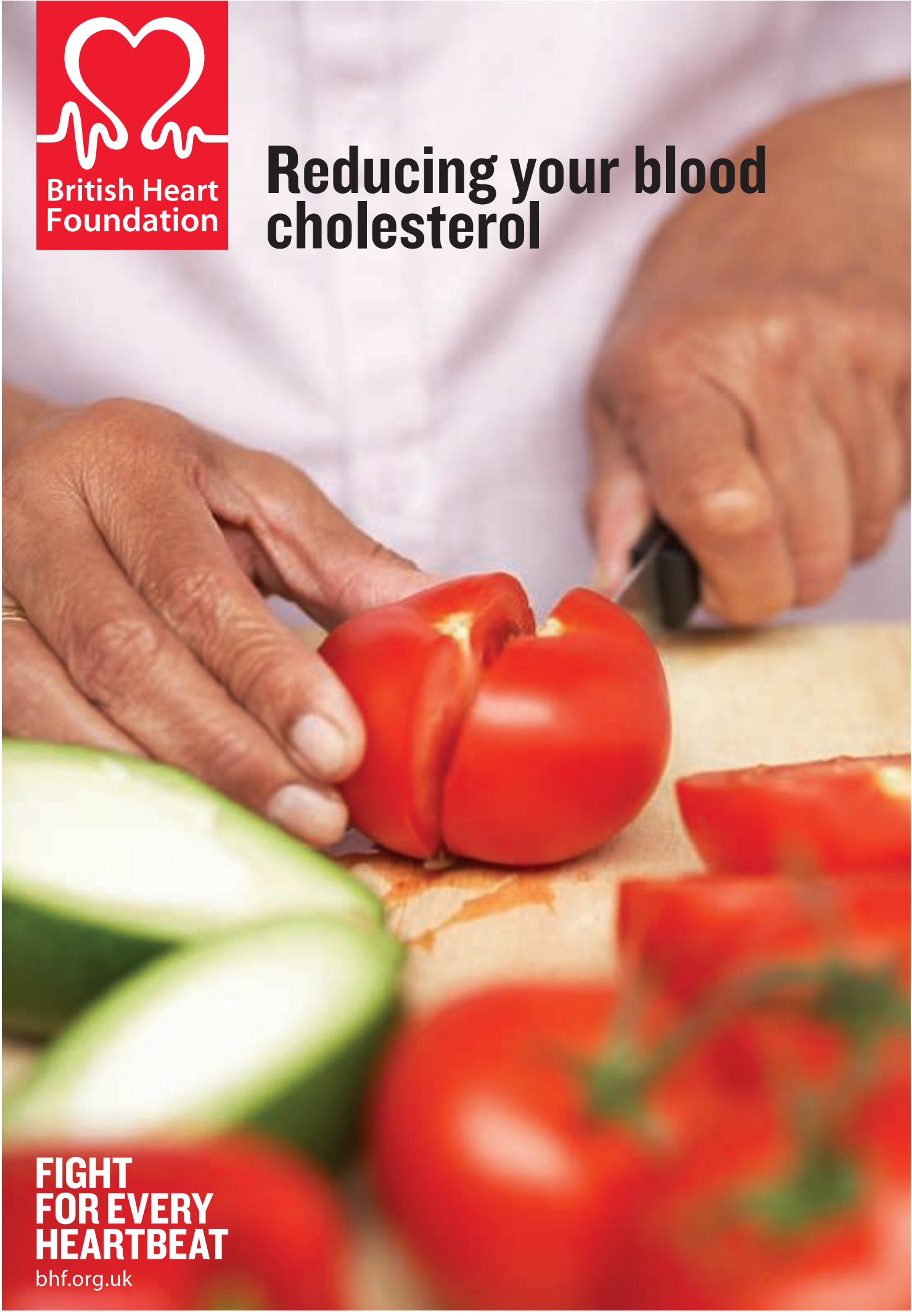




# Reducing your blood cholesterol



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## About this booklet

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This booklet is for people with a high blood cholesterol level, and for their family and friends. It explains:

- what cholesterol and blood lipids are
- how blood cholesterol is measured
- the role of cholesterol in coronary heart disease
- what causes high blood cholesterol
- how physical activity and healthy eating can help
- the medicines that are used to treat high blood cholesterol levels and how they can help, and
- why it's especially important that people with high cholesterol levels also control their blood pressure and don't smoke.

It also gives some information about the condition familial hypercholesterolaemia (FH).

This booklet does not replace the advice that your doctors, nurses or dietitians may give you, but it should help you to understand what they tell you.

# What are blood lipids, and what is cholesterol?

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Blood lipids is the name for all the fats in the blood, including **cholesterol** and **triglycerides**.

## Cholesterol

Cholesterol is a waxy substance which is mainly made in the body. The liver makes some of the cholesterol from the saturated fats in the foods you eat. (We explain more about which foods contain saturated fats on page 18.) Certain foods also contain some cholesterol (see page 21).

Cholesterol plays a vital role in how every cell works, throughout the body. It is also the material which the body uses to make other vital chemicals. However, having too much cholesterol in the blood can increase your risk of getting heart and circulatory disease. (Heart and circulatory disease includes coronary heart disease, stroke, and diseases that affect the circulation such as peripheral arterial disease. We explain more about coronary heart disease on page 11.)

## LDL cholesterol and HDL cholesterol

Cholesterol has a special 'transport system' for reaching all the cells that need it. It uses the blood circulation as its 'road system' and is carried on 'vehicles' made up of proteins. These combinations of cholesterol and proteins are called **lipoproteins**.

There are two main types of lipoproteins – **LDL** (low-density lipoprotein) and **HDL** (high-density lipoprotein). The lower the density of the lipoprotein, the more fats it contains.

- Low-density lipoproteins – sometimes called **LDL cholesterol** – carry cholesterol from the liver, through the bloodstream, to the cells. (LDL is known as the 'bad' cholesterol).
- High-density lipoproteins – sometimes called **HDL cholesterol** – return the extra cholesterol, that isn't needed, from the bloodstream to the liver. Here it is either broken down or passed out as a waste product. HDL cholesterol is a 'good' type of cholesterol because it removes the bad cholesterol from the bloodstream rather than depositing it in the arteries.

## Triglycerides

Triglycerides are another type of fatty substance in the blood. They are found in foods such as dairy products, meat and cooking oils. They can also be produced in the body, either by the body's fat stores or in the liver. People who are very overweight, eat a lot of fatty and sugary foods, or drink too much alcohol are more likely to have a high triglyceride level.

### Blood lipids

Blood lipids include **cholesterol** and **triglycerides**. Some types are 'bad', but one type (HDL cholesterol) is good.

#### Cholesterol

LDL cholesterol – **bad**

HDL cholesterol – **good**

#### Triglycerides – bad

## Total cholesterol

Your total cholesterol level is the total of the LDL, HDL and other fats in your blood.

## Cholesterol, triglycerides and the risk of coronary heart disease and stroke

People who have a **high total cholesterol level** have a higher risk of coronary heart disease than those with lower levels. The risk is particularly high if you have a high level of LDL cholesterol and a low level of HDL cholesterol (the 'good' cholesterol).

People with a **high triglyceride level** have a greater risk of coronary heart disease and stroke than people with lower levels. The risk is even greater if you also have other risk factors – for example, if you have a high cholesterol level, or you smoke, or you have diabetes or high blood pressure. (A risk factor is something that increases your chances of getting a disease.)

We explain more about how cholesterol increases the risk of coronary heart disease on page 11.



# How are blood cholesterol and triglycerides measured?

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You will need to have a simple blood test to measure your cholesterol and triglyceride levels. This can be done in two ways.

- Either a blood sample is taken and sent to a laboratory for analysis.
- Or a finger prick (capillary sample) is taken and analysed on a desktop analyser.

You may be given some special instructions before your blood test. For example, if you're having your triglyceride level measured, you will be asked not to eat anything and to drink only clear fluids for 12 hours before the test. You may also be asked not to drink any alcohol for 24 hours before the test. You should always follow the instructions that your doctor or nurse gives you.

Cholesterol and triglycerides are measured in units called millimols per litre of blood, usually shortened to 'mmol/litre' or 'mmol/l'. It is important to know what the levels of both LDL and HDL are, and not just the total cholesterol level.

For most people, it is recommended that the lower your total cholesterol level, the better, but there is no specific target cholesterol level to aim for.

However, people who are at high risk of, or who already have, heart and circulatory disease should aim for:

- a total cholesterol level under 4 mmol/l
- an LDL cholesterol level under 2 mmol/l
- an HDL cholesterol level above 1 mmol/l in men and above 1.2 mmol/l in women, and
- a triglyceride level under 1.7 mmol/l.

There can be quite a lot of variation in the levels of cholesterol in the blood – both from day to day and at different times of the day. So your doctor will not usually make a decision about whether to prescribe cholesterol-lowering medicines for you until he or she has a series of these readings.

Doctors can use your cholesterol measurements to assess your risk of coronary heart disease. To do this, they work out the ratio of your total cholesterol to your HDL cholesterol level. You can work this out by dividing your total cholesterol level by your HDL cholesterol level. (For example, if you have a total cholesterol of 4.5 mmol/l and an HDL level of 1.2 mmol/l, your ratio would be 4.5 divided by 1.2, which equals 3.75.) In terms of reducing your risk of coronary heart disease, the lower your ratio, the better.

# What part does cholesterol play in coronary heart disease?

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Coronary heart disease is caused when the coronary arteries (the arteries that supply the heart muscle with oxygen-containing blood) become narrowed by a gradual build-up of fatty material within their walls. This process is called **atherosclerosis**, and the fatty substance is called **atheroma**.

Atheroma develops when the level of the 'bad' LDL cholesterol is too high. On the other hand, HDL cholesterol is 'good' because it removes excess cholesterol from the circulation, and helps to protect against coronary heart disease.

**The aim is to have:**

- **a low total cholesterol level**
- **a low level of LDL cholesterol, and**
- **a high level of HDL cholesterol.**

**Eating a healthy diet can help to improve your cholesterol levels. It is important to understand how the different types of fats in foods affect your cholesterol level. On page 16 we describe the different types of fats and explain how to choose the healthier fats to help keep your cholesterol low.**

## When does a high blood cholesterol level matter?

The average total blood cholesterol level of adults living in England is 5.2 mmol/l. This average level has fallen steadily over the last 10 years, but it is important to get cholesterol levels down even further.

A high level of cholesterol is one of the most important risk factors for coronary heart disease. The other major risk factors are:

- smoking
- having high blood pressure
- not being physically active enough
- being overweight or obese
- having diabetes
- being of South Asian origin, and
- having a family history of premature coronary heart disease. (This means if a close blood relative of yours developed coronary heart disease before the age of 55 for a man, or 65 for a woman.)

**Your overall risk of having a heart attack is much greater if you have a high cholesterol level as well as one or more of the other major risk factors listed above.** This means, for example, if you have a high cholesterol level and diabetes, or if you also smoke or have high

blood pressure, or if you are not physically active or are overweight. The more risk factors you have, the higher your risk of having a heart attack.

There is also a greater risk of heart attacks among people who have **familial hypercholesterolaemia** – an inherited condition in which the blood cholesterol level is very high. For more on this, see page 38.

## **Other important ways to reduce your risk of coronary heart disease**

As well as following the advice on pages 15 to 23 for reducing your cholesterol level, there are other things you can do to reduce your risk of coronary heart disease.

- If you smoke, stop smoking. Within one year of quitting smoking, you can halve your risk of having a heart attack.
- If you have high blood pressure, reducing your blood pressure can lower your risk of having a stroke, a heart attack, or kidney failure.

# What causes high blood cholesterol?

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**A common cause of high blood cholesterol levels in people in the UK is eating too much saturated fat.**

However, some people have high blood cholesterol levels even though they eat healthily. Some have high cholesterol levels as a result of an underactive thyroid gland, long-term kidney problems, or having too much alcohol. Also, about 1 in every 500 people in the UK has a high cholesterol level because they have an inherited condition called familial hypercholesterolaemia (pronounced 'hyper-cholesterol-ee-me-ah') – or FH for short (see page 38).

## How can physical activity help improve my cholesterol level?

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Doing regular physical activity can help improve your cholesterol level. Aim to do a total of at least 150 minutes' activity a week – for example, brisk walking or cycling. That's 30 minutes a day on at least five days a week. You can do the 30 minutes all in one go, or in shorter bouts of at least 10 minutes at a time.

Being active can increase the level of HDL cholesterol (the 'good' cholesterol). It can also help lower your blood pressure, help you to maintain a healthy weight, and reduce your risk of getting diabetes.

To get the most benefit, you need to be active enough to make you feel warm and slightly puffed but still able to have a conversation. It's important to build up gradually the amount of activity that you do.

Think about how you can start to include more physical activity in your daily routine. For example, walk rather than using the car. Get off the bus or train a stop early and walk the rest of the way. Climb the stairs rather than using the lift.

For more about how to get more active, see our booklets *Physical activity and your heart* and *Get active, stay active!*

# How can healthy eating help improve my cholesterol level?

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Changing to a healthier diet can help reduce your cholesterol levels by over 10%. Some people may find that healthy eating has a greater effect on their cholesterol level than other people. But it's important to remember that, as well as helping to lower your cholesterol, making healthy changes to your diet benefits your heart health in many other ways. For example, it can help protect against high blood pressure, diabetes and putting on weight.

## Choosing healthier fats

In foods that contain fat, the fat is made up of a combination of saturated fats, monounsaturated fats and polyunsaturated fats. On page 18 we give examples of foods that contain all these different types of fats.

To help improve your cholesterol level you need to do the following.

- **Cut right down on saturated fats** and replace them with monounsaturated fats and polyunsaturated fats.
- **Avoid foods containing trans fats wherever possible.** These fats are most likely to be found in processed foods like biscuits and cakes, fast food, pastries, and some margarines and spreads.



## **What are trans fats?**

Trans fats occur naturally in small amounts in dairy foods and meat. However, it is the industrially produced trans fats which have been linked to an increased risk of coronary heart disease. Industrially produced trans fats are formed when vegetable oils are processed into solid fat through a process called hydrogenation. Trans fats produced in this way have a similar effect to saturated fat, as they can increase your LDL cholesterol and reduce HDL cholesterol. Foods that have 'hydrogenated oils' or 'hydrogenated fat' in the list of ingredients are likely to contain trans fats.

## Choosing healthier fats

To help reduce your cholesterol level, you need to cut down on saturated fats and trans fats and replace them with monounsaturated and polyunsaturated fats.

Omega-3 fats are good for your heart too.

	Unsaturated fats	
	Monounsaturated fats	Polyunsaturated fats
<b>Which foods are these fats found in?</b>	<p>Found in:</p> <ul style="list-style-type: none"><li>• olive oil and rapeseed oil</li><li>• avocado</li><li>• nuts and seeds (almonds, cashews, hazelnuts, peanuts and pistachios).</li></ul> <p>Some spreads are made from monounsaturated fats.</p>	<p>Found in:</p> <ul style="list-style-type: none"><li>• corn oil, sunflower oil and soya oil</li><li>• nuts and seeds (walnuts, pine nuts, sesame seeds and sunflower seeds), and</li><li>• oily fish such as herring, mackerel, pilchards, sardines, salmon, trout and fresh tuna.</li></ul> <p>Some spreads are made from polyunsaturated fats.</p>

	<b>Saturated fats</b>	
<b>Omega-3 fats</b>	<b>Saturated fats</b>	<b>Trans fats</b>
Found in fish oil.	<p>Found in:</p> <ul style="list-style-type: none"> <li>• butter</li> <li>• hard cheese</li> <li>• whole milk</li> <li>• fatty meat</li> <li>• meat products</li> <li>• biscuits</li> <li>• cakes</li> <li>• cream</li> <li>• lard</li> <li>• dripping</li> <li>• suet</li> <li>• ghee</li> <li>• coconut oil</li> <li>• palm oil</li> <li>• pastry.</li> </ul>	<p>Found in:</p> <ul style="list-style-type: none"> <li>• pastries</li> <li>• cakes</li> <li>• biscuits</li> <li>• crackers</li> <li>• fried foods</li> <li>• takeaways</li> <li>• hard margarines.</li> </ul> <p>Foods that have 'hydrogenated oils or fats' or 'partially hydrogenated oils or fats' in the list of ingredients are likely to contain trans fats.</p>

## How do the different types of fat in foods affect my cholesterol levels?

**Saturated fats** can increase total cholesterol and LDL cholesterol. LDL cholesterol increases the risk of fatty deposits developing in your arteries.

**Monounsaturated fats** can lower the LDL level and the ratio of total cholesterol to HDL, when they replace saturated fats and trans fats. They can also slightly increase HDL cholesterol and decrease triglycerides when they replace carbohydrates in the diet.

**Polyunsaturated fats** are an essential part of the diet. They can help lower LDL cholesterol, lower the ratio of total cholesterol to HDL, and reduce the risk of having a heart attack.

**Trans fats** can increase LDL cholesterol and lower HDL cholesterol.

The **omega-3 fats** found in fish oils can help to reduce triglyceride levels in the blood and the risk of stroke and heart attacks.

## **What about the cholesterol found in foods?**

The cholesterol found in some foods – such as egg yolk, liver and kidneys, shellfish such as prawns and fish roes (fish eggs) – does not usually make a great contribution to the level of cholesterol in your blood. If you need to lower your cholesterol level, it is much more important that you reduce the amount of foods you have that are high in saturated fat. However, if you have FH (see page 38), you will need to be more careful about the amounts of foods you eat which are high in cholesterol. Talk to your doctor or a dietitian for advice on these foods.

## **Other ways to improve your cholesterol levels**

Cutting down on the amount of saturated fat you eat and following a healthy diet – as we have described on pages 16 to 21 – will help to reduce your cholesterol. To reduce your cholesterol level even further, have the following foods regularly. They have all been shown to help lower cholesterol.

### **Eat more high-fibre foods**

Eating more whole grains, pulses, fruits and vegetables is an important part of a healthy diet. Some of these foods are especially high in soluble fibre, which helps to lower total and LDL cholesterol by reducing the amount of cholesterol that is absorbed into the bloodstream from

your intestine. Good sources of foods that are high in soluble fibre include oats, oat bran, whole barley, pulses such as baked beans, kidney beans, soya beans, peas, lentils and chickpeas, and certain fruit and vegetables like apples, pears, aubergine and sweet potato. Foods that are high in fibre also help to fill you up, which can be helpful if you are trying to lose weight.

### **Using foods with added plant stanols and sterols**

Plant stanols and sterols are substances which have been added to certain foods including some types of margarines, spreads, soft cheeses, yoghurt and cholesterol-lowering mini drinks. The effect varies between individuals, but there is evidence to show that plant stanols and sterols can help to reduce LDL cholesterol levels by up to 10% to 15% when people regularly have 2g a day as part of a healthy balanced diet. This may help to reduce the risk of heart attacks, although this hasn't yet been proven by research.

It's important to remember that plant stanols and sterols are not a substitute for a healthy diet nor a replacement for cholesterol-lowering medicines. If you decide to use these products, follow the manufacturer's serving instructions on the amount you need to consume each day to provide you with 2g of the plant stanol or sterol.

You can have these foods containing stanols and sterols as well as taking any cholesterol-lowering medicines your doctor has prescribed for you.

Plant sterol or stanol products are not recommended for adults who have not been found to have a high cholesterol level, and they're not suitable for women who are pregnant or breastfeeding.

### **Enjoy a range of unsalted nuts**

Unsalted nuts contain healthy unsaturated fats and fibre, which can help lower total cholesterol and LDL cholesterol. See page 18 for examples of healthy nuts. Try eating a handful of unsalted nuts a day (30g or about 1 ounce) either as a snack or as part of a meal.

### **Have some soya**

Soya products include soya milk and yoghurts, tofu, miso, textured soya protein, soya nuts and soya beans. They are naturally low in saturated fat and a good source of soluble fibre and vegetable protein, which may help to lower your cholesterol. For a change, try using fortified soya milk instead of cow's milk, or having soya nuts or soya yoghurt as a snack. Soya beans or mince can be used to replace some of the meat in dishes such as casseroles, stir-fries, pasta and salads.

## Peter's story

Peter Dowse, 64, explains what he did after he was told he had high cholesterol levels.

“When I was told I had raised cholesterol levels, I instantly visualised clogged-up arteries. A major change to my lifestyle was needed, and instead of starting on medication, I decided to adjust my lifestyle. My GP emphasised that I would need to have regular cholesterol checks in case I needed to take cholesterol tablets in the future.

The change started with introducing regular exercise, so I took up running. The first few times were challenging, but with perseverance it got better. My diet had to change too. I became more conscious of what I ate and checked food labels when shopping. As a family we started eating healthier and more balanced meals, more vegetables and less food high in saturated fats. I also limited alcohol to weekends.

18 months on – I’m a better runner, have maintained a healthy diet and lost over 3 stones. Most importantly, my cholesterol levels are now within normal limits. My wife says it’s like having a new man.”



## Other important ways to eat well to protect your heart

While it is important to lower your cholesterol level, it is also important to eat well and protect your heart generally. You can do this in the following ways.

### Follow a Mediterranean diet

There is evidence that the 'Mediterranean diet' can reduce the risk of cardiovascular disease. A Mediterranean diet incorporates the basics of healthy eating, but it has an emphasis on eating less meat and more fish, fruit, vegetables, grains, nuts, pulses and beans. It also includes using unsaturated oils instead of saturated fats such as butter. Olive oil, a monounsaturated oil, is the most commonly used oil in Mediterranean countries.

It seems that it's the combination of all the different foods – along with the Mediterranean lifestyle and eating pattern that go with it – that provides the heart health benefits.

Aim to eat a couple of portions of fish each week, and make one of these portions an oily fish. Try sardines on toast, or mackerel in a salad, or stir salmon through pasta.

Also, cut down on the foods that provide a lot of saturated fat in your diet – such as full-fat dairy products and butter – and replace them with monounsaturated and

polyunsaturated fats. See page 18 to find out which foods contain these fats.

## **Eat more fruit and vegetables**

Aim to have at least 5 portions of a variety of fruit and vegetables every day. Fresh, frozen, chilled, canned and dried fruit and vegetables, and 100% juice, all count. There is evidence that people who eat more than 5 portions of fruit and vegetables a day have a lower risk of heart disease. We still need to do more research to find out why this is. What we do know is that fruit and vegetables contain fibre and a variety of vitamins and minerals, which make them an important part of a healthy, balanced diet. Eating more fruit and vegetables also means there is less room in your diet for other foods that are high in saturated fat, salt and sugar. Taking dietary supplements doesn't seem to have the same health benefits as eating fruit and vegetables.

For more information on fruit and vegetables, see our booklet *Eating well*.

## **Cut down on salt**

Eating less salt can lower your risk of getting high blood pressure, which is linked to heart disease and stroke. And if you already have high blood pressure, eating less salt can help to lower it. You should have no more than 6 grams of

salt a day – that’s about one level teaspoon. Try not to add salt to your food. Use extra pepper, herbs, garlic or spices to add flavour to your food instead. Choosing more fresh foods rather than ready meals or processed foods will also help you cut down on salt.

Salt substitutes may not be suitable for some people – for example, those with kidney problems or heart failure. So check with your doctor before using these products.

For more information, see our booklets *Blood pressure* or *Cut down on salt*.

### **Drink alcohol within the sensible limits**

Drinking more than the sensible limits of alcohol can lead to muscle damage, high blood pressure, stroke and some types of cancer. Men should not regularly drink more than 3 to 4 units of alcohol each day, and women should not regularly drink more than 2 to 3 units each day.

### **Be a healthy body weight and shape**

Being overweight and carrying too much weight around your middle can put you at greater risk of developing heart problems, high blood pressure and diabetes. If you’re not sure whether you are overweight or if your body shape puts your health at risk, ask your doctor or practice nurse.

To measure your waist yourself, find the midpoint between

the bottom of your ribs and the top of your hips. For most people this is at the level of the tummy button. Breathe out normally and measure around your waist. Try to relax, and avoid breathing in while taking your measurement. Check your measurement in the box below.

	Your health is <b>at risk</b> if you have a waist size of:	Your health is <b>at high risk</b> if you have a waist size of:
<b>Men</b>	Over 94 centimetres (about 37 inches)	Over 102 centimetres (about 40 inches)
<b>Women</b>	Over 80 centimetres (about 31½ inches)	Over 88 centimetres (about 34½ inches)
<b>South Asian men</b>		Over 90 centimetres (about 35 inches)
<b>South Asian women</b>		Over 80 centimetres (about 31½ inches)

People of South Asian background are more likely to have a higher proportion of body fat to muscle than the rest of the UK population, and they also tend to carry this fat around their middle. This means that South Asians have a greater risk of developing problems such as coronary heart disease and stroke at a lower waist size than other people in the UK.

## Will I need to take medicine?

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Whether you need to take cholesterol-lowering medicine depends not just on your cholesterol level, but also on your overall risk of coronary heart disease. The higher your risk of coronary heart disease, the more likely it is that your doctor will recommend cholesterol-lowering medicines (usually statins) for you.

Even if you don't have high cholesterol levels, your doctor may still feel that you will benefit from taking cholesterol-lowering medicines if he or she thinks you are at high risk. For example, someone with low cholesterol levels but with several major risk factors for coronary heart disease might be given statins. On the other hand, a person with a slightly high cholesterol level but with no other risk factors might not be given medicines to lower their cholesterol.

Your doctor is likely to prescribe cholesterol-lowering medicines such as statins if you have one or more of the conditions listed below:

- if you have diabetes
- if you have high blood cholesterol levels, particularly if you also have other risk factors – for example, if you have high blood pressure or if you smoke

- if you have familial hypercholesterolaemia (FH)
- if you have had a heart attack or stroke
- if you have angina or peripheral arterial disease, or
- if you have had bypass surgery or an angioplasty.

We explain more about the different types of cholesterol-lowering medicines on the next page.

Cholesterol-lowering medicines are a long-term and effective treatment. However, it is important to get your lifestyle right as well as taking these medicines. Stopping smoking, eating a healthy diet, doing regular physical activity, controlling your weight and making sure your blood pressure is normal, will all help to improve your cholesterol and protect your heart. If you are concerned about being at risk, talk to your doctor or nurse and discuss any changes you could make to your lifestyle to reduce your risk.

# How can medicine help?

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## Statins

The main type of medicine used to reduce cholesterol levels is statins.

Statins can reduce total cholesterol levels by more than 20% and LDL levels by more than 30% and can increase HDL by between 3% and 10%. Overall, they can reduce the risk of having a heart attack or stroke by about a quarter.

Statins can help to stabilise the atheroma (the build-up of fatty deposits) within the lining of the arteries and so reduce your risk of having a heart attack or stroke. This is why most people who are at high risk of coronary heart disease, stroke or peripheral arterial disease, or who have diabetes, are prescribed a statin medicine even if they have a normal cholesterol level.

There are several statins available in the UK. Many of these have been tested in long-term trials that have looked not just at the cholesterol levels they produce but also at their effect on health and long-term safety. For people who are already at high risk of having a heart attack, the benefits of taking statins are likely to outweigh the possible risk of side effects.

Your doctor will choose the best statin and dose for you, depending on your medical history and your target cholesterol level. He or she may change your statin if it does not help to lower your cholesterol level as much as it needs to. However, if your doctor is planning to change your statin, you should have a blood cholesterol test and liver function tests before and after the change. This will help to make sure that the new medicine works well for you.

Statins are not suitable for people who have liver disease or for women who are pregnant or breastfeeding. If you're already taking statins and are thinking of starting a family, you should speak to your doctor before stopping your medicines.

Some statins should be taken in the evening, because our bodies make most of our cholesterol overnight, when we are usually asleep.

If you are taking a statin called simvastatin, you should avoid drinking grapefruit juice or eating grapefruit. However, if you're taking another type of statin, you may be able to have small quantities of grapefruit juice (or grapefruit). If you have any questions about statins and grapefruit, talk to your doctor or pharmacist.



## Possible side effects of statins

Side effects of statins can include feeling sick, being sick, diarrhoea and headaches.

A rare side effect of statins is inflammation of the muscles (myositis). If you have any unexpected muscle pain, tenderness or weakness, you should tell your doctor. He or she may change the type of statin you are taking, or the dose.

### Over-the-counter statins

These are statins that people can buy from their local pharmacist's without a prescription from a doctor. They are not a substitute for adjusting your lifestyle to reduce your cholesterol, and they are not suitable for everyone. Your pharmacist will be able to tell you whether these medicines are suitable for you. Before giving you any advice, he or she will ask you about your risk factors for heart disease – such as whether you smoke, or have high blood pressure. They will also tell you if you need to have regular blood tests to check that your liver and kidneys are working properly.

## Other cholesterol-lowering medicines

There are other types of medicines which can be used to control blood cholesterol levels either instead of, or as well as, statins. These are:

- fibrates
- medicines which bind bile acids, and
- ezetimibe.

These medicines may be prescribed by a specialist, either if statins don't work for you, or if you can't take them for some reason.

Many of these medicines act by preventing the intestine from absorbing cholesterol. This in turn prevents cholesterol entering the bloodstream and raising blood cholesterol levels.

### Fibrates

Fibrates are useful for people who have a high level of triglycerides. They may also be used with other medicines to lower your cholesterol if you cannot take statins.

You will not usually be given fibrates if you are also taking statins (see page 31), except under strict medical supervision. You should not use fibrates during pregnancy, or if you have liver or kidney disease.

## Medicines which bind bile acids

These medicines (which are also called 'bile-binding medicines' or 'bile-acid-binding resins') work by preventing the bile acids, which the liver makes from cholesterol, from getting re-absorbed into the bloodstream.

They come in powder form, granule form and as tablets. The powder and granules are taken by mixing them with water, fruit juice or yoghurt. You should take these medicines immediately before or during a meal. They may make you feel fuller than usual at first, but most people gradually get used to this.

These medicines are not absorbed into the body, so they can also be used safely by children and pregnant women, under specialist medical supervision.

If you also take other medicines, you will need to take them at least one hour before, or four hours after, your bile-acid-binding medicines. So speak with your GP about the best times to take all your medicines.

### *Possible side effects*

Some people who take these medicines may get heartburn or constipation, but this is more likely with larger doses.

These medicines can also interfere with the absorption of fat-soluble vitamins (vitamins A, D, E and K), so your doctor may advise you to take vitamin supplements.

## Ezetimibe

Ezetimibe is another type of cholesterol-lowering medicine. It can be used along with a statin. Or, people who can't take statins can take ezetimibe on its own. Ezetimibe helps to lower blood cholesterol levels by preventing the small intestine from absorbing cholesterol. Ezetimibe can help reduce LDL cholesterol by about 20%, and if it is combined with low-dose statins it can be even more effective. More research is needed to confirm the long-term benefits of this medicine.

### *Possible side effects*

Side effects of ezetimibe include headaches, pain in the abdomen, and diarrhoea.

## Medicines to help reduce triglyceride levels

If you control your weight, and limit how much alcohol you drink and yet you still have a high triglyceride level, your doctor may prescribe fish oil supplements or fibrates for you.

If you're taking fish oil supplements that have not been prescribed for you, tell your doctor about them so that he or she can make sure they don't interfere with any other medicines you are taking, such as warfarin.

For more information on cholesterol-lowering medicines, see our booklet *Medicines for your heart*.

# Familial hypercholesterolaemia (FH)

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## What is familial hypercholesterolaemia?

About 1 in 500 people in the UK have a condition called **familial hypercholesterolaemia**, or **FH** for short, which can lead to exceptionally high levels of cholesterol in the blood. FH is a genetic condition, which means it is passed on through families and is caused by one or more altered genes.

In people with FH, the blood cholesterol levels are high from birth. The way LDL cholesterol is removed from the blood circulation works only about half as effectively as normal. So, an adult with FH may have a total cholesterol level of between 7.5 and 12 mmol/l, and sometimes much higher. Children and young women may have lower levels, but the level is usually above 6.7 mmol/l in children.

Anyone who is suspected of having FH should be referred to a specialist lipid clinic for an assessment and to confirm a diagnosis. Children should be referred to a specialist with expertise in FH in children and young people.

## For more information

For more information on FH, how it is inherited and the treatment for it, see our booklet *Inherited heart conditions – Familial hypercholesterolaemia*.

You can also get more information on FH from:

### **HEART UK – The Cholesterol Charity**

7 North Road

Maidenhead

Berkshire SL6 1PE

Helpline: 0845 450 5988 (Monday to Friday, 10am to 3pm.

Calls are charged at a local rate.)

Website: [www.heartuk.org.uk](http://www.heartuk.org.uk)

Email: [ask@heartuk.org.uk](mailto:ask@heartuk.org.uk)

## How your support can help

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For over 50 years the BHF has pioneered research that's transformed the lives of people living with heart and circulatory conditions. For example, the BHF played a key role in funding two important research studies about the role of the cholesterol-lowering medicine statins, and it is now thought that statins save over 10,000 lives a year in England alone.

The first study, in 1989, looked at how effective statins are for preventing coronary heart disease, and proved that statins are safe and effective. The second study showed that statins reduce the risk of heart attack and stroke, even in people with normal cholesterol levels.

We aim to play a leading role by continuing to support vital research. The number of people dying from heart and circulatory disease each year in the UK is falling. But this means that more people are living with the disease, so there is still a great deal to be done.

Our next big challenge is to discover how to help the heart muscle repair itself, and find a cure for heart failure. Visit our website [bhf.org.uk/findthecure](https://www.bhf.org.uk/findthecure) to find out about our Mending Broken Hearts Appeal and see how your support can help make a difference.



## For more information

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### British Heart Foundation website

**bhf.org.uk**

For up-to-date information on heart disease, the BHF and its services.

### Heart Helpline

**0300 330 3311** (a similar cost to 01 and 02 numbers)

For information and support on anything heart-related.

### Genetic Information Service

**0300 456 8383** (a similar cost to 01 and 02 numbers)

For information and support on inherited heart conditions.

### Booklets and DVDs

To order our booklets or DVDs:

- call the BHF Orderline on **0870 600 6566**, or
- email [orderline@bhf.org.uk](mailto:orderline@bhf.org.uk), or
- visit [bhf.org.uk/publications](http://bhf.org.uk/publications)

You can also download many of our publications from our website. For a list of resources available from the BHF, ask for a copy of our catalogue *Take heart*. Our booklets are free of charge, but we would welcome a donation. (See page 2 for how to make a donation.)

## Heart Information Series

This booklet is one of the booklets in the *Heart Information Series*. The other titles in the series are as follows.

Angina

Atrial fibrillation

Blood pressure

Cardiac rehabilitation

Caring for someone with a heart condition

Coronary angioplasty

Diabetes and your heart

Having heart surgery

Heart attack

Heart rhythms

Heart transplantation

Heart valve disease

Implantable cardioverter defibrillators (ICDs)

Keep your heart healthy

Living with heart failure

Medicines for your heart

Pacemakers

Peripheral arterial disease

Physical activity and your heart

Primary angioplasty for a heart attack

Reducing your blood cholesterol

Returning to work with a heart condition

Tests for heart conditions

## Our services

For more information about any of our services, contact the **Heart Helpline** on **0300 330 3311** or visit **bhf.org.uk**

### Emergency life support skills

For information about Heartstart – a free, two-hour course in emergency life support skills, including what to do if someone seems to be having a heart attack – call the **BHF Helpline** on **0300 330 3311** or visit **bhf.org.uk**

### Heart Matters

Heart Matters is the BHF's **free**, personalised service that provides support and information for people who want to improve their heart health. Join today and enjoy the benefits, including *heart matters* magazine and an online members' area. Call the **Heart Helpline** on **0300 330 3311**, or join online at **bhf.org.uk/heartmatters**

### Heart support groups

Local heart support groups give you the chance to talk about your own experience with other heart patients and their carers. They may also include exercise classes, talks by guest speakers, and social get-togethers. To find out if there is a heart support group in your area, contact the **Heart Helpline** on **0300 330 3311**.

## **Make yourself heard – Heart Voices**

Heart Voices gives you the skills, confidence and knowledge you'll need to influence health services for the benefit of heart patients and their families across the UK. It aims to develop a nationwide network of representatives to speak out on behalf of heart patients and their carers, and to provide them with training and opportunities to have their say and get involved.

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## Have your say

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We would welcome your comments to help us produce the best information for you. Why not let us know what you think? Contact us through our website at [bhf.org.uk/contact](https://www.bhf.org.uk/contact). Or, write to us at the address on the inside front cover.

## Acknowledgements

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**British Heart  
Foundation**

Coronary heart disease is the UK's single biggest killer.

For over 50 years we've pioneered research that's transformed the lives of people living with heart and circulatory conditions. Our work has been central to the discoveries of vital treatments that are changing the fight against heart disease.

But so many people still need our help.

From babies born with life-threatening heart problems to the many Mums, Dads and Grandparents who survive a heart attack and endure the daily battles of heart failure.

Join our fight for every heartbeat in the UK. Every pound raised, minute of your time and donation to our shops will help make a difference to people's lives.

**FIGHT  
FOR EVERY  
HEARTBEAT**

[bhf.org.uk](http://bhf.org.uk)