



# Reducing your blood cholesterol



**FIGHT  
FOR EVERY  
HEARTBEAT**

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

## About the British Heart Foundation

The British Heart Foundation (BHF) is the nation's heart charity, saving lives through pioneering research, patient care and vital information.

### What you can do for us

**We rely on donations of time and money to continue our life-saving work.** If you would like to make a donation, please:

- call our donation hotline on **0300 330 3322**
- visit **bhf.org.uk/donate**, or
- post it to us at the address on the back cover.

If you wish to make a gift to the BHF in your will, call **0844 847 2787** or email **legacy@bhf.org.uk** and ask for our free booklet, *My generation*.

For other ways to support our work, see **bhf.org.uk/supportus**

## British Heart Foundation website

You may find other useful information on our website at:

**bhf.org.uk**

# Contents

---

About this booklet .....	4
What is cholesterol, and what are blood lipids? .....	5
How is blood cholesterol measured? .....	9
What part does cholesterol play in coronary heart disease? .....	11
What causes high blood cholesterol? .....	14
How can physical activity help improve my cholesterol level? .....	15
How can healthy eating help improve my cholesterol level? .....	17
Will I need to take medicine? .....	30
How can medicine help? .....	33
Familial hypercholesterolaemia (FH) .....	41
For more information .....	43
Technical terms .....	47
Index .....	49
Have your say .....	50

## About this booklet

---

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).

We explain the technical terms used in this booklet on page 47.

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 is cholesterol, and what are blood lipids?

---

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 in your body from the saturated fats in the foods you eat. (Very little cholesterol is found in foods, except for eggs, liver and kidneys, and seafood such as prawns, all of which do contain some cholesterol.)

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 which 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.
- High-density lipoproteins – sometimes called **HDL cholesterol** – return the extra cholesterol, that isn't needed, from the bloodstream to the liver. 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 is blood cholesterol measured?

---

Measuring blood cholesterol involves a simple blood test. It can be done in two ways.

- Either a blood sample is taken with a syringe and needle 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 LDL and HDL are, and not just the total cholesterol level. 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, 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.) The higher your ratio is, the greater your risk of coronary heart disease. You need to aim for this figure to be below 4.

## What part does cholesterol play in coronary heart disease?

---

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 17 we describe the different types of fats and 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 and Scotland is 5.3 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 41.

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

As well as following the advice on pages 15 to 39 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?

---

**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 41).

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

---

Doing regular physical activity – for example, brisk walking or cycling – for 30 minutes a day on at least five days a week can help improve your cholesterol level. 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.

Here are some examples of how you can start to include physical activity in your daily routine.

- Walk rather than use the car.
- Get off the bus or train a stop early and walk the rest of the way.
- Climb the stairs rather than use 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?

---

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

Foods containing fat are made up of a combination of saturated fats, monounsaturated fats and polyunsaturated fats. On page 20 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.
- **Reduce the *total* amount of fat you eat** – especially if you are overweight. Choosing healthier fats can help

protect your heart, but remember that all fats are high in calories. For example, cut down on foods such as pastries, crisps and biscuits, and replace them with healthier alternatives such as fruit or vegetables.

- **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.

### **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.

- **Eat oily fish regularly.** Oily fish provide the richest source of a particular type of polyunsaturated fat known as omega-3 fats. They can also help to lower blood triglyceride levels, help prevent the blood from clotting, and help keep the heart rhythm regular. Eating oily fish can also help to improve your chance of surviving after a heart attack. For more about oily fish and omega-3 fats, see page 22.

## 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).</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>
<p>Found in:</p> <ul style="list-style-type: none"> <li>• fish oil</li> <li>• oily fish such as herring, mackerel, pilchards, sardines, salmon, trout and fresh tuna.</li> </ul> <p>See page 22 for more about omega-3 fats from sources other than fish.</p>	<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>

## Oily fish and omega-3 fats

Oily fish such as herring, mackerel, pilchards, sardines, salmon, trout and fresh tuna are good sources of omega-3 fats. If you have had a heart attack, aim to have 2 to 3 portions of oily fish a week. (1 portion of oily fish = 140 grams or half a medium can of fish.) Otherwise you should aim to have 2 portions of fish a week, one of which should be oily fish. Try to eat a variety of fish and, if possible, choose those that are 'sustainably sourced', such as those carrying the Marine Stewardship Council (MSC) logo. (This means that the fish come from fisheries that aim to secure fish stocks for the future and help to protect the marine environment.)

If you don't like oily fish, you can get omega-3 fats from vegetable sources. These include flaxseed, rapeseed, soya and walnut oils, unsalted nuts such as walnuts, pecans, peanuts and almonds, soya beans and tofu, dark green vegetables, sweet potatoes and wholegrain foods. There are also foods which have been enriched with omega-3 such as *some* eggs, milk and yoghurts. However, we don't yet know for certain if the omega-3 fats in these foods bring exactly the same benefits as the omega-3 fats from oily fish.

Omega-3 supplements are only prescribed for people who have recently had a heart attack and who cannot eat

2 to 3 portions of oily fish a week. Before taking fish oil supplements that have not been prescribed for you, it's important to talk to your doctor or dietitian about whether you should take them.

### **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 don't lower the level of HDL cholesterol (the 'good' cholesterol).

**Polyunsaturated fats** are an essential part of the diet. They can help lower LDL cholesterol (which is a good effect), but they also lower HDL cholesterol (the 'good' cholesterol).

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

The **omega-3 fats** found in oily fish can help to reduce triglyceride levels in the blood.

## 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 reduce your cholesterol level, it is much more important that you eat foods that are low in saturated fat. However, if you have FH (see page 41), 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

### Eat more high-fibre foods

Foods high in fibre – especially those high in soluble fibre – help 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, barley, pulses such as baked beans, kidney beans, soya beans, peas, lentils and chickpeas, and certain fruit and vegetables like apples, pears, artichokes 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.

## What about 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 and yoghurt. Although they are not routinely recommended, there is some evidence that eating between 2 grams and 2.5 grams of plant stanols and sterols a day can lower cholesterol by an extra 10% on top of having a healthy diet low in saturated fat and taking a statin (a cholesterol-lowering medicine). However, it's important to remember that plant stanols and sterols are not a substitute for a healthy diet. And they're not a replacement for cholesterol-lowering medicines. If you decide to use these products, follow the manufacturer's serving instructions to make sure you have the recommended amount of stanol or sterol a day. 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 don't have a high cholesterol level, and they're not suitable for women who are pregnant or breastfeeding.

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

Unsalted nuts and seeds contain healthy unsaturated fats, antioxidants and fibre, which can help lower total, and LDL, cholesterol. See page 20 for examples of healthy nuts. However, nuts and seeds also contain a lot of calories, so keep to the recommended one handful (30 grams or about 1 ounce) of unsalted nuts a day.

## **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, antioxidants and protein, which may help to lower your cholesterol. Choosing soya, particularly as a replacement for meats or other foods that are high in saturated fat, is likely to be good for your heart.

## **Choose more wholegrains**

Wholegrains such as wheat, barley, rice and oats are not only good sources of cholesterol-lowering soluble fibre, but they also contain other nutrients that are good for heart health, such as omega-3 fats and antioxidants. Try to choose wholegrain versions for half of the starchy carbohydrates you eat – for example, choose brown rice, wholemeal bread, wholemeal pitta and wholegrain cereals.

## 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.

### 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 they 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. 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. Low-salt alternatives 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 booklet *Blood pressure*.

## Drink alcohol within the sensible limits

Drinking moderate amounts of alcohol can offer some benefit to heart health as it can raise HDL cholesterol (the 'good' cholesterol). But you can achieve the same benefit in other ways, such as eating healthily and being physically active (see pages 17 and 15). Drinking more than the sensible limits of alcohol can lead to muscle damage, high blood pressure, stroke and some types of cancer. Men should drink no more than 3 to 4 units of alcohol each day, and women no 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 – that is, having a waist size of more than 94 centimetres (about 37 inches) for men, 90 centimetres (about 35½ inches) for men of South Asian origin, or 80 centimetres (about 31½ inches) for women – 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.

For more information on how to lose weight, see our booklet *So you want to lose weight ... for good.*

## Will I need to take medicine?

---

Whether you need to take cholesterol-lowering medicine or not depends not just on your total cholesterol, HDL and LDL levels, but also on your overall risk of coronary heart disease and whether you have the inherited condition familial hypercholesterolaemia (FH). People with this condition have very high blood cholesterol levels from birth (see page 41).

Doctors prescribe cholesterol-lowering medicines for people who are at greatest overall risk of suffering from coronary heart disease. So your doctor is likely to prescribe cholesterol-lowering medicines, such as statins:

- 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 angioplasty.

The higher your risk of coronary heart disease, the more likely it is that your doctor will recommend cholesterol-lowering medicines 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, such as statins, if you have a combination of major risk factors for coronary heart disease. These include, for example, if you have high blood pressure, if you smoke, if you have a strong family history of coronary heart disease (if a close relative developed coronary heart disease before the age of 55 for a man, or 65 for a woman), or if you are of South Asian origin. Your age is also relevant, as your risk of coronary heart disease and stroke usually increases with age. Your sex is relevant too, as women before the menopause have some protection from hormones.

There are various sets of guidelines to help doctors decide whether to recommend that you take cholesterol-lowering medicines. All of this means that people with a wide range of cholesterol levels may be treated with cholesterol-lowering medicines. For example, someone with low cholesterol levels but with several major risk factors might be given statins. On the other hand, a person with a slightly higher cholesterol level but with no other risk factors might not be treated with cholesterol-lowering medicines.

We explain more about the different types of cholesterol-lowering medicines on pages 33 to 39.

Cholesterol-lowering medicines are a long-term and effective treatment. However, it is important to lower your overall risk of coronary heart disease as much as possible. This includes getting your lifestyle right as well as taking cholesterol-lowering medicines. Stopping smoking, eating a healthy diet, taking regular physical activity, controlling your weight and making sure your blood pressure is normal, will all help.

Currently there is no recommendation that people should take a statin as 'primary prevention'. This means that, if you are not at risk of getting coronary heart disease or having a stroke, and you don't have angina and you haven't had a heart attack, your doctor will probably not prescribe statins for you as a way of preventing heart disease. 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?

---

### 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%. 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 drug 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. Your doctor 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.

Most statins should be taken in the evening, because our bodies make most of our cholesterol at night. However, you can take atorvastatin and rosuvastatin at any time that has been prescribed for you.

If you are taking the statin drug 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
- nicotinic acid medicines, and
- ezetimibe.

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 33), 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, in sachets. You have to soak some types in fruit juice before you take them. Others are already mixed with fruit flavouring and you just need to add water. 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.

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.

### *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.

## Nicotinic acid medicines

Nicotinic acid medicines help to lower LDL levels and increase the level of 'good' HDL cholesterol.

### *Possible side effects*

Common side effects of these medicines are flushing of the face and itching over the body. However, a new preparation, which also contains an antihistamine, can reduce these effects as far as possible.

If you are also taking medicines to reduce your blood pressure, or if you have low blood pressure, taking nicotinic acid can lower your blood pressure further. You should discuss this with your doctor before taking nicotinic acid.

## 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 which reduce triglyceride levels (fish oils)**

If you regularly eat oily fish, control your weight, and limit how much alcohol you have and yet you still have a high triglyceride level, your doctor may prescribe fish oils for you.

If you're taking fish oils which have not been prescribed for you, tell your doctor about them so that he or she can make sure that 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*.

## How your support helps

Over recent decades, thanks to our supporters, research funded by the BHF has contributed to a substantial reduction in the number of people dying from heart attacks and strokes. For example, the BHF part-funded one of the world's largest research trials of cholesterol-lowering medicines for people known to be at high risk of heart disease. Millions of people are now benefiting from using statins, and it is now thought that they save over 10,000 lives a year in England alone.

We need your support to continue our research so that heart and circulatory disease is no longer a major cause of disability in the UK. See page 2 for how to make a donation.

# Familial hypercholesterolaemia (FH)

---

## What is familial hypercholesterolaemia?

About 1 in 500 people in the UK have inherited a high blood cholesterol level due to a condition called **familial hypercholesterolaemia**, or **FH** for short.

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.

## For more information

For more information on FH, how it is inherited and the treatment for it, see our booklet *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)

## For more information

---

### 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**, or
- visit **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 heart health catalogue*. 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

Reducing your blood cholesterol

Returning to work with a heart condition

Tests for heart conditions

## My progress record

This is a personal health record for people with a heart condition. You can use it to keep a record of important information, and to chart the progress you are making in tackling your risk factors for coronary heart disease. You can order a copy from the BHF (see page 43), and work through it with your health professional. A short version, *My progress card*, is also available.

## Heart Matters

Heart Matters is the BHF's **free**, personalised service to help you live with a healthy heart. Join today and enjoy the benefits, including *heart matters* magazine, a Heart HelpLine and an online members' area with articles, recipes and lifestyle tips. You can join online at **bhf.org.uk/heartmatters** or call **0300 330 3300** (a similar cost to 01 and 02 numbers).

## Emergency life-support skills

### Heartstart

For information about a free, two-hour course in emergency life-support skills, contact **Heartstart** at the British Heart Foundation. The course teaches you to:

- recognise the warning signs of a heart attack
- help someone who is choking or bleeding

- deal with someone who is unconscious
- know what to do if someone collapses, and
- perform cardiopulmonary resuscitation (CPR) if someone has stopped breathing and his or her heart has stopped pumping.

## Technical terms

---

<b>atheroma</b>	Fatty deposits that can build up within the walls of the arteries.
<b>cholesterol</b>	A fatty substance mainly made in the body by the liver.
<b>coronary heart disease</b>	When the walls of the arteries become narrowed by a gradual build-up of fatty deposits called atheroma.
<b>familial hypercholesterolaemia</b>	An inherited condition in which the blood cholesterol level is very high.
<b>HDL</b>	High-density lipoprotein. The 'good' cholesterol.
<b>LDL</b>	Low-density lipoprotein. The 'bad' cholesterol.
<b>lipids</b>	Fatty substances in the blood.
<b>lipoproteins</b>	Combinations of cholesterol and proteins.
<b>mmol/l</b>	Millimols per litre. Unit used for measuring cholesterol and other fats in the blood.
<b>omega-3 fat</b>	A type of polyunsaturated fat found in certain types of fish.
<b>trans fats</b>	A type of fatty acid that acts like saturated fats.

**triglycerides**

A type of fatty substance found in the blood.

# Index

---

bile-acid-binding medicines .....	36
blood pressure .....	12, 27
causes of high blood cholesterol .....	14
children .....	37, 41
cholesterol .....	5
in foods .....	24
measurement of .....	9
role in coronary heart disease .....	11
targets .....	9
test .....	9
diet .....	17
eggs .....	24
ezetimibe .....	38
familial hypercholesterolaemia .....	14, 41
fats .....	17
FH .....	14, 41
fibrates .....	36
fish oil supplements .....	23, 39
HDL .....	6
healthy eating .....	17
LDL .....	6
lipids .....	5
medicines .....	30, 33
monounsaturated fats .....	17, 20, 23
nicotinic acid medicines .....	38

oily fish .....	18, 22
omega-3 fats .....	21, 22, 23
over-the-counter statins .....	35
physical activity .....	15
polyunsaturated fats .....	17, 20, 23
pregnancy .....	34, 37
saturated fats .....	14, 17, 21, 23
smoking .....	12, 13
stanols .....	25
statins .....	30, 33
sterols .....	25
supplements: fish oil supplements.....	23, 39
thyroid gland .....	14
trans fats .....	18, 21, 23
triglycerides .....	7, 8
unsaturated fats .....	20

## Have your say

---

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**. Or, write to us at the address on the back cover.

## Acknowledgements

The British Heart Foundation would like to thank all the GPs, cardiologists and nurses who helped to develop the booklets in the *Heart Information Series*, and all the patients who commented on the text and design.

Particular thanks for their work on this booklet are due to:

- Clare Neuwirth, Lipid Specialist Nurse, Imperial College Healthcare NHS Trust.

Edited by Wordworks.

This booklet was last updated in July 2011.



**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)