

Reducing your blood cholesterol

Heart Information Series Number 3



British Heart
Foundation

BEATING HEART DISEASE TOGETHER

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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
- how medication can help, and
- why it's especially important for people with high cholesterol levels also to control their blood pressure and not smoke.

It also gives information about the drugs that are used to treat high blood cholesterol levels, and about familial hyperlipidaemia (FH).

We explain the technical terms used in this booklet on page 46.

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 fatty substances in the blood, including **cholesterol** and **triglycerides**.

Cholesterol

Cholesterol is a waxy substance which is mainly made in the body. The liver makes it mostly from the saturated fats in food. (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, 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.)

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

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.

If you are having your triglyceride level measured, you will be asked not to eat anything, and to drink only clear fluids, for 12 hours before you have the test.

Cholesterol and triglycerides are measured in units called millimols per litre of blood, usually shortened to 'mmol/litre' or 'mmol/l'. 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. ¹

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 drugs 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 and an HDL level of 1.2, 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 4.¹

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 condition 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. The most important thing is to reduce the total amount of fat in your diet, especially saturated fat (animal fat). We explain which foods are high in fat and saturated fat on pages 16-19.

When does a high blood cholesterol level matter?

The average total blood cholesterol level of adults living in England and Scotland is 5.5 mmol/l.^{2,3} 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:

- having diabetes
- 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 on page 12 – 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 hyperlipidaemia** – an inherited condition in which the blood cholesterol level is very high. For more information on this, see page 35.

Other important ways to reduce your risk of coronary heart disease

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

- Smokers can halve their risk of a heart attack within one year of quitting smoking.⁴
- If you have high blood pressure, reducing your blood pressure can lower your risk of having a stroke, heart attack, or kidney failure.⁵

What causes high blood cholesterol?

The most common cause of high blood cholesterol levels in people in the UK is eating too much fat, especially saturated fat. However, some people have high blood cholesterol levels even though they have a healthy diet.

Some people 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 500 people have high cholesterol levels because of the inherited condition familial hyperlipidaemia⁶ (see page 35).

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.⁷ You can do the 30 minutes all in one go, or in shorter bouts of at least 10 minutes a time. Being active can increase the level of HDL cholesterol (the ‘good’ cholesterol).⁷ It can also help lower your blood pressure, help you to maintain a healthy weight and reduce your risk of getting diabetes.⁷ 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!*

How can healthy eating help improve my cholesterol level?

Eating a healthy diet can help reduce your cholesterol levels by over 10%.⁸ However, some people find that healthy eating can have a greater effect on their cholesterol level than other people.

Choosing healthier fats

Foods containing fat are made up of a combination of saturated fats, monounsaturated fats and polyunsaturated fats. On pages 18-19 we give examples of which foods 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. (This is because fat is also very 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. Or, at mealtimes, cut down on the amount of fatty foods you eat by filling up with starchy foods such as bread, pasta

or rice instead – particularly the wholegrain versions of these foods.

- **Cut down on foods containing trans fats.** This means cutting down on processed foods such as cakes, biscuits and pastries.

What are trans fats?

Trans fats are found naturally in very small amounts in foods such as dairy foods and meat. Trans fats are also formed when vegetable oils are partly ‘hydrogenated’ and used to make hard margarines and processed foods such as some cakes, biscuits, pastries and crackers. 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 that can help to lower blood triglyceride levels, help prevent the blood from clotting, and help to regulate the heart rhythm.⁹ For more about oily fish and omega-3 fats, see page 20.

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
Which foods are these fats found in?	<p>Found in:</p> <ul style="list-style-type: none">• olive oil and rapeseed oil• avocado• nuts and seeds (almonds, cashews, hazelnuts, peanuts and pistachios). <p>Some margarines and spreads are made from monounsaturated fats.</p>	<p>Found in:</p> <ul style="list-style-type: none">• corn oil, sunflower oil and soya oil• nuts and seeds (walnuts, pine nuts, sesame seeds and sunflower seeds). <p>Some margarines and spreads are made from polyunsaturated fats.</p>

	Saturated fats	
Omega-3 fats	Saturated fats	Trans fats
<p>Found in:</p> <ul style="list-style-type: none"> • fish oil • oily fish such as herring, mackerel, pilchards, sardines, salmon, trout and fresh tuna. <p>See page 20 for more about omega-3 fats from sources other than fish.</p>	<p>Found in:</p> <ul style="list-style-type: none"> • butter • hard cheese • fatty meat • meat products • biscuits • cakes • cream • lard • dripping • suet • ghee • coconut oil and palm oil. 	<p>Found in:</p> <ul style="list-style-type: none"> • pastries • cakes • biscuits • crackers • hard margarines. <p>Foods that have 'hydrogenated oils' or 'hydrogenated fat' in the list of ingredients are likely to contain trans fats.</p>

Oily fish and omega-3 fats

Oily fish – for example, herring, mackerel, pilchards, sardines, salmon, trout and fresh tuna – provide the richest source of a particular type of polyunsaturated fat known as omega-3 fats that can help to protect against heart disease. Aim to have 2 portions of fish a week.¹⁰ One of these portions should be oily fish. If you have had a heart attack, aim to have 2 or 3 portions of oily fish a week, to help protect your heart.¹⁰ (1 portion of oily fish = 100 grams or 4 ounces of fish, or half a medium can of fish.)

If you don't like oily fish, you can get omega-3 fats from vegetable sources such as flaxseed oil and rapeseed oil, and from some nuts and seeds such as walnuts and flax seeds. However, we do not 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.

Or, you might want to take omega-3 supplements instead. It is important that you discuss taking supplements with your doctor, nurse or dietitian first.

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.¹¹

Monounsaturated fats can lower the LDL level and do not lower the level of HDL cholesterol (the 'good' cholesterol).¹²

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).¹²

Oily fish contains a particular type of polyunsaturated fat called **omega-3 fats**. These can help to reduce triglyceride levels in the blood.

Other ways to improve your cholesterol levels

Eating a high-fibre diet

Eating foods that are high in 'soluble fibre' – such as porridge, beans, pulses, lentils, nuts, fruits and vegetables – can help lower cholesterol. A high-fibre diet also helps to fill you up – making you less likely to snack on fattening foods.

What about the cholesterol found in foods?

The cholesterol found in some foods – for example eggs, liver and kidneys, and some types of seafood such as prawns – 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.

Will eating sterol-enriched foods help reduce my cholesterol level?

There is evidence that substances called 'plant sterols' and 'stanols' – which are added to certain foods including margarines, spreads, soft cheeses and yogurts – may reduce blood cholesterol levels. They may be helpful for people who cannot take cholesterol-lowering drugs, or for those who still have high cholesterol levels even though they have already made changes to their diet. They can also be taken with cholesterol-lowering drugs.

But even if you do eat sterol-enriched foods, it is still important to make sure you follow a healthy diet.

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 to 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. For more information about fruit and vegetables, see our booklet *Eating for your heart*.
- Make the most of the wide variety of **beans, pulses and peas**.
- Enjoy a range of **nuts and seeds**. However, these contain a lot of calories, so don't have too many if you are watching your weight.
- Try to include some **soya protein** (soya milk, soya yogurts, tofu, miso, and textured soya protein) in your diet. For more information on soya, see our booklet *Eating for a healthy heart*.

- **Cut down on salt.** Don't 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.
- **Drink alcohol in moderation.** Keep within the sensible limits. Men should drink no more than 3-4 units each day and women no more than 2-3 units each day.¹³
- **Keep to a healthy weight for your height.** If you are not sure whether you are overweight, ask your doctor or practice nurse.

Will I need to take medication?

Whether you need to take cholesterol-lowering drugs or not depends not just on your total cholesterol, HDL and LDL levels, but also on your overall risk of coronary heart disease.

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 drugs, 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 you smoke
- if you have already 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 drugs.

Even if you don't have high cholesterol levels, your doctor may still feel that you will benefit from taking cholesterol-lowering drugs, 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 South Asian. 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's risk of heart disease lags about 10 years behind that of men.

There are various sets of guidelines to help doctors decide whether to recommend that you take cholesterol-lowering drugs. All of this means that people with a wide range of cholesterol levels may be treated with cholesterol-lowering drugs. 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 high cholesterol level but with no other risk factors might not be treated with cholesterol-lowering drugs.

We explain more about the different types of cholesterol-lowering medicines on pages 28-33.

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.

How can medication help?

Statins

The main type of drugs used to reduce cholesterol levels is statins. Examples of statins are simvastatin, pravastatin, rosuvastatin, atorvastatin and fluvastatin.

Statins can reduce total cholesterol levels by more than 20%, and LDL levels by more than 30%.¹⁴ Overall, they can reduce the risk of having a heart attack or stroke by about a quarter.¹⁵

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 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. Simvastatin is no longer patented, which means that it is much cheaper than other statins. So, if you're taking a statin other than simvastatin, your doctor may suggest that you swap to simvastatin. This is sensible because it can work well for most people. However, if your doctor is planning to change your statin, you should have a blood cholesterol test before and after the change to make sure that simvastatin works well for you.

Statin are not suitable for people who have liver disease or for women who are pregnant or breastfeeding.

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.

If you are taking the statin drug simvastatin, you should avoid drinking grapefruit juice or eating grapefruit.¹⁶ However, if you're taking another statin, such as atorvastatin, you could have small quantities of grapefruit juice (or the grapefruit).¹⁷ If you have any questions about statins and grapefruit, talk to your doctor or pharmacist.

Possible side effects of statins

Unwanted 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 you can buy at your local pharmacist's without a prescription from your 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.

Other cholesterol-lowering drugs

There are other types of drugs which can be used to lower blood cholesterol levels. These are:

- fibrates
- drugs which bind bile acids
- nicotinic acid drugs, and
- ezetimibe.

These drugs all act by preventing the intestine from absorbing cholesterol.

Fibrates

Examples of fibrates include bezafibrate, ciprofibrate, fenofibrate and gemfibrozil.

Fibrates are useful for people who have a high level of both blood cholesterol and triglycerides. You will not usually be given fibrates if you are also taking statins (see page 28), except under strict medical supervision. You should not use fibrates during pregnancy, or if you have liver or kidney disease.

Drugs which bind bile acids

These drugs (which are also called 'bile acid binding drugs') include cholestyramine and colestipol. They work by binding bile acids which the liver makes from the cholesterol in the blood, and preventing the bile acids from getting reabsorbed 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 drugs 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 drugs are not absorbed into the body, so they can also be used safely by children and pregnant women.

Possible side effects

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

Nicotinic acid drugs

Nicotinic acid and acipimox are drugs that help to lower LDL levels and increase the level of 'good' HDL cholesterol.

Ezetimibe

Ezetimibe is another type of cholesterol-lowering drug. It can be used along with a statin, or people who cannot 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 18%, and if it is combined with low-dose statins it can be even more effective.¹⁸ More research is needed to confirm the long-term benefits of this drug.

Possible side effects

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

Drugs 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 are taking fish oils which you have bought over the counter, tell your doctor about them so that he or she can make sure that they don't interfere with any other drugs you are taking such as warfarin.

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

My progress record

My progress record – a booklet produced by the British Heart Foundation – 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. For example, this could include how you are getting on with reducing your cholesterol, reducing your blood pressure, losing weight or giving up smoking. It also contains information about coronary heart disease to help you make informed decisions about your health. Your nurse or doctor may be able to order a copy for you, or you can order a copy from the British Heart Foundation (see page 41), and work through it with your health professional.

FH (familial hyperlipidaemia)

What is familial hyperlipidaemia?

About 1 in 500 people in the UK have inherited a high blood cholesterol level due to a condition called **familial hyperlipidaemia** or **FH**.⁶ This condition is also sometimes called **familial hypercholesterolaemia**.

In people with FH, the way LDL cholesterol is removed from the blood circulation works only about half as effectively as normal. This means that their blood cholesterol level roughly doubles. So an adult with FH may have a cholesterol level of between 8 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.

How is FH passed on?

FH is almost always inherited from a parent. ('Familial' means running in the family.) One parent may have had a heart attack or developed angina at an early age. Angina and heart attacks are increasingly common in people in the UK from their mid-60s onwards. If they happen at an earlier age, they are considered as happening 'prematurely'. Even if the parent with FH has not had

any heart trouble, he or she will have a high blood cholesterol level.

FH is a 'dominantly inherited' disorder. This means that if you have FH, your brothers and sisters and your own children will each have an even (50/50) chance of having FH too.

If you have been told you have FH, it is important to ask other members of your family to talk to their doctor about this, and to have their blood cholesterol levels measured. Many people with FH are not obese and may not have any other risk factors for coronary heart disease. If you are related to someone with FH, don't put off asking for a blood cholesterol test just because you feel you are fit and well at the moment.

Anyone with FH who has a child should find out as early as possible if their child has inherited FH. It is important to find out at least by the time the child is five because even at this age, healthy eating is important. As the child gets older it is particularly important that he or she does not start to smoke.

What are the signs of FH?

If a child has a blood cholesterol higher than 6.7 mmol/l and has normal triglyceride levels, it is almost certain that he or she has FH.¹⁹

If an adult has a total cholesterol over 7.5 mmol/l or has an LDL cholesterol above 4.9 mmol/l, along with a strong family history of coronary heart disease, as well as physical signs such as xanthomata (which we explain below) they are likely to have FH.¹⁹

Among adults, certain tell-tale signs of FH may develop, which in themselves carry no risk. These include hard lumps in the tendons at the back of the ankles called xanthomata and often also in the tendons which run near the knuckles on the back of the hands. The lumps at the back of the ankles can be troublesome because they can get inflamed and painful and this can make it very uncomfortable to wear shoes. A white ring may also develop around the outside of the coloured part of the eye. However, this is a feature not just of FH. It can also happen in more common kinds of high blood cholesterol and sometimes even in people who do not have high blood cholesterol.

The effects of FH

Having FH increases the risk of developing coronary heart disease. FH affects men and women equally. However, its effect on the risk of coronary heart disease is rather different. Without treatment, most men and half of women with FH will suffer angina or a heart attack before they are 60. Even at the age of 70 some women who do

not have treatment may not have developed coronary heart disease, whereas this would be very rare for a man. So, a man who inherits FH from his mother may develop heart trouble long before she does. This is probably the most common reason why some men with FH have no apparent family history of angina or heart attacks.

Treatment for FH

The treatment for FH is very similar to the treatment used for other more common types of high blood cholesterol described on pages 28-33. FH is very unlikely to respond to diet alone, and many people will need to take cholesterol-lowering drugs as well as keeping to a healthy diet. Children may need to take cholesterol-lowering medicines if there is a particularly strong family history of FH.

Ideally, you should see a doctor who has specialist knowledge of FH. This will help make sure that you get the most appropriate treatment. A specialist can also tell if you have any symptoms or signs of heart trouble, or if you may develop them.

Many women with FH may, after talking it over with their doctor, choose to put off treatment with drugs until there is no longer any chance of them becoming pregnant while on medication. However, pregnant women can safely take bile acid binding drugs, as these are not absorbed by the body.

Apheresis

Apheresis is a type of treatment which may be used for some people who have extremely high blood cholesterol. It is rather like dialysis. You are connected to a machine that clears the LDL cholesterol from your blood and then returns the blood back into your body. This takes about three hours and needs to be repeated every two weeks.

What you can do to help yourself if you have FH

Healthy eating and treatment with cholesterol-lowering drugs – as we have described on pages 16-33 – are clearly important. However, it is not possible to say that treatment from an early age will completely remove the risk of heart trouble. Also, at present in the UK, most people with FH do not discover that they have it until they are in middle age or already have heart trouble. People with FH can benefit from the many remarkable advances that there have been in treating coronary heart disease, both with drugs and surgery. If you have FH and you experience any chest discomfort – especially while you are exercising or are under stress – you should report it quickly to your doctor.

If you have FH and are thinking of having a child

There is an extremely rare cause of particularly high blood cholesterol in childhood called **homozygous FH**. This can happen if both parents have FH. If you have FH and are thinking of having children, ask the doctor to check your partner's blood cholesterol level. The chance of your partner also having FH is very small (about 1 in 500).⁶ However, if he or she does have FH, you will need special genetic counselling to advise you about the risk of your child being seriously affected. If your partner does not have FH, each of your children will have an even (50/50) chance of inheriting your type of FH.

However, early diagnosis and new treatments have improved the outlook for people with FH. So, you should not make FH a major reason for limiting your family, certainly until you have had one or two children.

For more information

For more information on familial hyperlipidaemia (FH), contact:

Heart UK

7 North Road
Maidenhead
Berkshire SL6 1PE

Phone: 01628 628638
Website: www.heartuk.org.uk
Email: ask@heartuk.org.uk

For more information

British Heart Foundation website

bhf.org.uk

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

Booklets

To order any of our booklets:

- 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 information on other BHF booklets, and on videos and DVDs, ask for a copy of the *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.

- 1 Physical activity and your heart
- 2 Smoking and your heart
- 3 Reducing your blood cholesterol
- 4 Blood pressure
- 5 Eating for your heart
- 6 Angina
- 7 Heart attack
- 8 Living with heart failure
- 9 Tests for heart conditions
- 10 Coronary angioplasty and coronary bypass surgery
- 11 Valvular heart disease
- 12 Having heart surgery
- 13 Heart transplantation
- 14 Palpitation
- 15 Pacemakers
- 16 Peripheral arterial disease
- 17 Medicines for the heart
- 18 The heart – technical terms explained
- 19 Implantable cardioverter defibrillators (ICDs)
- 20 Caring for someone with a heart condition
- 21 Returning to work with a heart condition
- 22 Diabetes and your heart
- 23 Cardiac rehabilitation

Heart health magazine

Heart health is a free magazine, produced by the British Heart Foundation especially for people with heart conditions. The magazine, which comes out four times a year, includes updates on treatment, medicines and research and looks at issues related to living with heart conditions, like healthy eating and physical activity. It also features articles on topics such as travel, insurance and benefits. To subscribe to this **free** magazine, call **0870 850 5281** or go to **bhf.org.uk/hearthealthmag**.

Emergency life-support skills

Heartstart UK

For information about a free, two-hour course in emergency life-support skills, contact Heartstart UK 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.

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Technical terms

apheresis	A treatment for people with extremely high blood cholesterol levels.
atheroma	Fatty deposits that can build up within the walls of the arteries.
atherosclerosis	The build-up of fatty deposits within the walls of the arteries.
blood cholesterol	Cholesterol found in the blood.
blood lipids	Fatty substances found in the blood.
cholesterol	A fatty substance mainly made in the body by the liver.
coronary heart disease	When the walls of the arteries become narrowed by a gradual build-up of fatty deposits called atheroma.
ECG	See 'electrocardiogram'.
electrocardiogram	A test to record the rhythm and activity of the heart. Also called an ECG.
familial hyper-cholesterolaemia	Another term for 'familial hyperlipidaemia'.
familial hyperlipidaemia	An inherited condition in which the blood cholesterol level is very high.
HDL	High-density lipoprotein. The 'good' cholesterol.

hypertension	High blood pressure.
LDL	Low-density lipoprotein. The 'bad' cholesterol.
lipids	Fatty substances in the blood.
lipoproteins	Combinations of cholesterol and proteins.
mmol/l	Millimols per litre. Unit used for measuring cholesterol and other fats in the blood.
omega-3 fat	A type of polyunsaturated fat found in certain types of fish.
trans fats	A type of fatty acid that acts like saturated fats.
triglycerides	A type of fatty substance found in the blood.

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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.

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Heart Information Line

08450 70 80 70

(A local-rate number)

An information service
for the public and
health professionals
on issues relating to
heart health.



British Heart Foundation

14 Fitzhardinge Street

London W1H 6DH

Phone: 020 7935 0185

Website: bhf.org.uk