

# Angina

Heart Information Series Number 6



British Heart  
Foundation

*The nation's heart charity*

## About the British Heart Foundation

The British Heart Foundation (BHF) is the leading national charity fighting heart and circulatory disease – the UK’s biggest killer. The BHF funds research, education and life-saving equipment, and helps heart patients return to a full and active way of life.

## 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 website

You may find other useful information on our website at:

**bhf.org.uk**

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## About this booklet

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This booklet is for people with **angina**, and for their family and friends. It explains:

- what angina is
- what causes angina
- the tests used to diagnose angina
- treatments for angina including drugs, coronary angioplasty and coronary bypass surgery
- what acute coronary syndrome is, and
- what to do, and what not to do, to prevent your angina getting worse.

We explain the technical terms used in this booklet on page 56.

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

## What is angina?

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Angina is an **uncomfortable feeling or pain in the chest**. It usually feels like a heaviness or tightness in the centre of the chest which may spread to the arms, neck, jaw, back or stomach. In some people, the pain or tightness may affect only the arm, neck, stomach or jaw. Some people describe angina as a dull, persistent ache. Symptoms usually fade within about 10 to 15 minutes. For some people the tightness is severe; for others it is not much more than mild discomfort.

### What brings on an angina attack?

Angina can be brought on by physical activity or emotional upset. It often comes on when you are walking. If it is a cold day or if you are walking after a meal, the angina may be triggered more easily. You may sometimes get an attack of angina while you are resting, or it may even wake you when you are asleep.

### Stable angina and unstable angina

Many people have angina that comes on with a particular amount of exercise, and is well controlled with drugs. This is known as **stable angina**.

**Unstable angina** is angina which has just developed for the first time, or angina which was previously stable but has recently got worse or changed in pattern. For example, your angina pain may come on after doing much less exercise or after less stress than usual, or it may even come on while you are resting. If the pattern of your angina changes in this way, tell your doctor about it immediately, as you may need to go to hospital for some tests and treatment.

### What to do if you get an angina attack

If you get an attack of angina, you should stop what you are doing and rest until the discomfort has passed. You may also need to take medication to relieve the discomfort. Most people are prescribed a nitrate tablet or a spray for under the tongue to relieve angina. We tell you more about nitrates on page 26. See the next page for what to do if the pain does not go away and if you think you may be having a heart attack.

#### You may be having a heart attack:

- if you get a crushing pain, or heaviness or tightness in your chest, or
- if you get a pain in your arm, throat, neck, jaw, back or stomach.

You may also sweat, or feel light-headed, sick, or short of breath.

### What to do if you think you may be having a heart attack

This is what to do.

**1 Stop** what you are doing.

**2 Sit down** and rest.

**3 If you have a GTN** (glyceryl trinitrate) spray or tablets, use the spray or take the tablets as your doctor or cardiac rehabilitation team has told you. If the pain, discomfort or tightness continues, especially if it has not gone within 15 minutes (don't wait longer than this), dial 999 straight away.

**If you don't have GTN**, stay resting and try to stay calm. If the pain, discomfort or tightness continues, especially if it has not gone within 15 minutes (don't wait longer than this), dial 999 straight away.

**4** If you're not allergic to aspirin, chew an adult aspirin tablet (300mg) if there is one easily available. If you don't have an aspirin next to you, or if you don't know if you are allergic to aspirin, just stay resting until the ambulance arrives.

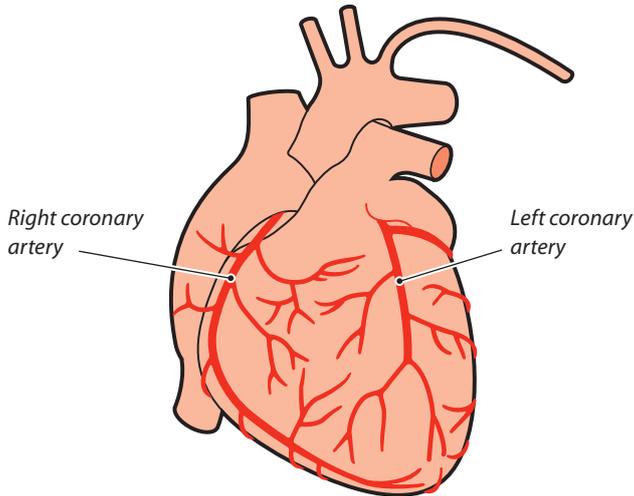
**The two most important things you can do are to call the ambulance and to stay resting.**

## What causes angina?

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The muscle of the heart needs its own supply of oxygen and nutrients so that it can pump blood around your body. The coronary arteries deliver oxygen-rich blood to the heart's muscle. Two main coronary arteries (the left and the right) divide many times so that the blood reaches all the parts of the heart's muscular wall.

### The heart



The coronary arteries can become narrowed by a gradual build-up of fatty material within their walls. (This process is called **atherosclerosis** and the fatty material is called **atheroma**.) In time, the artery may become so narrow that it cannot deliver enough oxygen-containing blood to the heart muscle when its demands are high – such as when you are doing exercise. The pain or discomfort that happens as a result is called angina.

You are particularly likely to develop atherosclerosis if:

- you smoke any form of tobacco
- you have high blood pressure
- you have a high blood cholesterol level
- you take little physical activity, or
- you have diabetes.

Other risk factors are being overweight or obese, and having a family history of relatives having a heart attack or angina before the age of 55 for a man or 65 for a woman. (A 'risk factor' is something that increases your risk of developing atherosclerosis).

## How will I know if it's angina?

The most common cause of chest pain is narrowed coronary arteries, but many chest pains or discomfort have nothing to do with the heart. Short, sharp stabbing pains are often muscular pains. Some people get a dull, persistent ache under the left breast when they are tense or anxious. Indigestion can also cause pain in the centre of the chest, but this is usually related to food rather than exercise. Severe anaemia can also cause chest pain. If you have a chest pain that you are worried about, it is important to talk to your doctor about it.

## What's the difference between angina and a heart attack?

A heart attack happens when a narrowed coronary artery becomes blocked by a **blood clot**. The chest pain that comes with a heart attack is sometimes more severe than angina. Also, it usually lasts longer and it doesn't usually go away with rest. You may sweat and feel sick. A nitrate tablet or spray, which are usually very effective in relieving angina, may not help. Unusual indigestion symptoms which do not get better after taking medication may be a heart attack. If you are in any doubt, it is best to call 999. See page 7 for advice on what to do if you think you are having a heart attack. See also our booklet *Heart attack and rehabilitation*.

## What is acute coronary syndrome?

When someone has a persistent chest pain or chest discomfort which seems to be coming from the heart, it is sometimes difficult for the doctors and nurses to tell whether the person is having an episode of **unstable angina** (see page 6) or a **heart attack** (see page 10). The term used when this happens is 'acute coronary syndrome'. 'Syndrome' means a set of symptoms that happen at the same time, and 'coronary' means to do with the coronary arteries.

**So, acute coronary syndrome is a general term that describes a heart attack or unstable angina.**

For more information on acute coronary syndrome, see our booklet *Heart attack and rehabilitation*.

## How can doctors diagnose angina?

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Your GP may be able to tell if you have angina from the symptoms you describe. However, it is harder to diagnose angina in women than in men. The GP will listen to your heart to check its rate and rhythm, and will assess your general condition. He or she will also carry out tests to assess your risk factors, such as a test for diabetes and a blood cholesterol test. (A blood cholesterol test measures the level of cholesterol and other fats in your blood.)

Your doctor may also send you for one or more specific tests on the heart. These include:

- an **electrocardiogram (ECG)** or an **exercise ECG**
- a **stress echocardiogram**
- a **radioisotope scan**
- a **coronary angiogram** (cardiac catheterisation).

Some people may have an **MRI scan** or a **CT scan**.

All these tests are usually carried out in hospital as a day case (which means that you don't have to stay overnight).

We describe these tests on the next pages. For more information about them, see our booklet *Tests for heart conditions*.

## Electrocardiogram (ECG) or exercise ECG

Your doctor is likely to send you for an electrocardiogram (ECG), which records the rhythm and electrical activity of your heart. The test is painless and usually takes about five minutes.

Small patches, set in sticky plaster, are put on your arms, legs and chest and are connected to a recording machine. The machine then takes a reading. If you have narrowing of the coronary arteries, the ECG may show an abnormal reading. The ECG can provide evidence to diagnose angina and help to establish how severe it is. However, you could have a normal ECG reading and still have narrowed coronary arteries and get angina.

Angina often occurs with physical activity. This means that, if the ECG is done while you are resting, it may show a normal reading. For this reason you may be asked to do an **exercise ECG**. This is an ECG carried out while you are pedalling an exercise bike or walking on a treadmill.

## Stress echocardiogram

Bats fly in the dark by sending out pulses of sound and listening for echoes reflected from objects around them. A similar idea is used to record an echocardiogram.

A recorder (probe) is placed on your chest and a pulse of high-frequency sound is passed through the skin of your chest. Lubricating jelly is rubbed on your chest first, to help make a good contact with the probe. The probe then picks up the echoes reflected from various parts of your heart and shows the echoes as an echocardiogram – a picture on a screen. You can see different parts of the heart as the probe is moved around on your chest. Recording these images is a skilful job and can take up to an hour. The test doesn't hurt at all.

A 'stress echocardiogram' is when the echocardiogram is recorded after the heart has been put under stress – either with exercise or with a drug.

## Radioisotope scan

This test is also known as a **radionuclide scan** or a **myocardial perfusion scan**. It is useful for people who cannot exercise (and who, as a result, cannot do an exercise ECG). For women, a radioisotope scan can be more useful than the exercise ECG for diagnosing angina.

Some radioactive material (isotope) – technetium, tetrofosmin, technetium MIBI or thallium – is injected into the blood. This is sometimes done while you are on an exercise bike. If you are unable to exercise, you will be given a drug called adenosine or dobutamine instead. This mimics the effect of exercise on the body, while you are still resting. Or you may be asked to do a little bit of gentle exercise and have a small amount of adenosine or dobutamine as well.

A large camera, positioned close to the chest, picks up the gamma rays the isotope produces. This shows which parts of the heart muscle are short of blood and measures how severe the condition is.

The amount of radiation you are exposed to during a radionuclide scan is the equivalent of having about 900 chest X-rays. See the next page for more about radiation.

### Is there any radiation in these tests?

Some of the tests described in this booklet – radioisotope scans, coronary angiograms and CT scans – involve radiation. Every day you are exposed to small amounts of naturally occurring radiation in the environment. Having an X-ray of any type increases your exposure to radiation. A chest X-ray, for example, can be compared to one and a half days of natural background radiation. On pages 15-20 we tell you if a test involves radiation and, if so, how much radiation is involved. Your doctor will think carefully before arranging for you to have any test which involves radiation.

ECGs, stress ECGs and MRI scans do not involve any radiation.

### Coronary angiogram

A coronary angiogram is an X-ray picture of the blood vessels. A fine, flexible, hollow tube called a **catheter** is passed into an artery either in your groin or arm. It is gently passed through until it reaches the coronary arteries. A dye is then injected into the coronary arteries and X-rays are taken from several angles.

The X-rays are like a 'road map' of all your arteries, showing where the arteries are narrowed and how narrow they have become.

The test is not usually painful as you will have a local anaesthetic first. Some people feel a 'hot flush' or warm feeling when the dye is being injected.

The amount of radiation you are exposed to during a coronary angiogram is the equivalent of having about 500 chest X-rays.

While a coronary angiogram is being done, it is sometimes possible to treat narrowed coronary arteries, using a technique called coronary angioplasty (see page 32).

## CT scan of the coronary arteries

More and more patients who are having tests for coronary heart disease – especially those who have private health care – are now being offered a CT scan. This test is also known as a **computed tomography scan** or a **CAT scan**.

### What is it?

A CT scan is a sophisticated type of X-ray. It is useful for looking at the organs in your body, such as your heart or lungs.

### What happens during the test?

The radiographer or nurse will ask you to lie down on a narrow bed. He or she may inject a substance known as a contrast agent into a vein in your arm. The contrast agent will make it easier to see the arteries around your heart during the scan. Your kidneys will get rid of the contrast agent from your body within a few hours. When the test starts, the bed will move slowly along the scanner. You will hear a mechanical noise as the scanner is switched on. You will be alone in the room while the scan is taking place, but you will be able to speak to the radiographer using a microphone. The test does not cause any pain and takes about 15 minutes to half an hour.

The level of radiation you are exposed to during a CT scan of the coronary arteries is the equivalent to having about 650 chest X-rays.

### What can the test show?

A CT scan of your heart can show two things. The most common thing it can show is the amount of calcified or hardened fatty areas in the arteries around your heart. This is given to you as a calcification score.

If you get a low calcification score, it is unlikely that you have coronary heart disease, so you won't need any more tests.

A high calcification score means that you have a considerable amount of hardened fatty deposits lining the arteries around your heart. However, a high calcification score on its own does not give your cardiologist enough information to help him or her decide what treatment you need. So, if you get a high calcification score, you will probably have to have other tests such as a stress ECG and possibly an angiogram.

### Multi-slice CT scan

Another sophisticated type of CT scan – called a multi-slice CT scan – can also show very good pictures of the arteries around your heart. Some people may be offered this type of CT scan instead of a conventional

coronary angiogram. There is still some debate about whether the pictures produced by a multi-slice CT scan are as good as those produced by a conventional angiogram. The technology is improving all the time, so in the future multi-slice CT scans may replace angiograms as a diagnostic test. However, at the moment coronary angiograms are still more widely used than multi-slice CT scans to investigate coronary heart disease.

## MRI scan

Magnetic Resonance Imaging (MRI) is a technique which produces detailed pictures of your internal organs – such as your heart – by putting you inside a strong magnetic field.

MRI scans are not routinely used to diagnose angina. However, you may have an MRI scan if your cardiologist thinks that you were born with an abnormality of one of the arteries around your heart.

The test takes about an hour and is not uncomfortable. You can have the test done as a day case. To have the scan done, you lie in a short tunnel, which holds a large magnet. The MRI scanner sends out short bursts of magnetic fields and radio waves and creates images of the heart which can be processed and analysed. You will have to take off all jewellery before you have the scan. You need to lie still while you are having the test done. You will hear knocking noises while the scan is being carried out, but you don't need to worry about them.

Because of the high cost of the MRI scanner, there are only a few centres in the UK where you can have this test done. If you need to have an MRI scan, your cardiologist may refer you to one of these centres, but there may be a waiting list.

If you have a pacemaker, you cannot have an MRI scan because it can affect how the pacemaker works.

## How is angina treated?

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Most people who are diagnosed with angina will have drug treatment at first, but some people will need coronary angioplasty or coronary bypass surgery. The treatment you are offered will depend on how severe your angina is, whether the angina is stable or unstable, and your overall condition. We describe all these treatments on pages 23-38.

## Drug treatment

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You can think of drugs for angina as those which prevent your condition from getting worse and reduce the risk of a heart attack, and those that relieve your symptoms.

Drugs for people with angina can:

- reduce the chance of blood clots developing (anti-platelet drugs such as aspirin)
- increase the blood supply to your heart (nitrates and potassium channel activators)
- reduce the work your heart has to do (beta-blockers and some calcium channel blockers), and
- help keep your blood cholesterol levels down (statins and fibrates).

### **Remember, never run out of your tablets!**

Once you have been diagnosed with angina, it is likely that you will have to keep taking some drugs for the rest of your life. Most people with coronary heart disease are prescribed aspirin and a cholesterol-lowering drug and, depending on how severe your angina is, you may also be given some of the other drugs listed above – to protect your heart from further damage. Even if you have a coronary angioplasty or a coronary bypass operation, you will most probably still need to continue taking a combination of drugs afterwards.

## Anti-platelet drugs (such as aspirin)

Anti-platelet drugs help to prevent the blood from clotting. They do this by reducing the 'stickiness' of platelets – the small blood cells that can clump together to form a clot. So anti-platelet drugs can help to prevent heart attacks and strokes.

### Aspirin

The most commonly used anti-platelet drug is aspirin. Aspirin has been used for relieving pain for more than 100 years. The dose of aspirin you need for the anti-platelet effect is smaller than the dose you would need to relieve a headache.

Aspirin is used for most people with known coronary heart disease, unless there are strong reasons for not giving it – for example, if you are allergic to it or if you have had a serious unwanted effect from aspirin before, such as serious bleeding.

### Clopidogrel

Clopidogrel is another anti-platelet drug. It is sometimes given along with aspirin to certain people for a set period of time. It is useful for people with unstable angina (see page 6) or for those who have recently had a coronary angioplasty with stenting (see page 32). Sometimes, clopidogrel is used for people who can't take aspirin because they have a condition such as asthma.

### Unwanted effects of anti-platelet drugs

Anti-platelet drugs can cause indigestion, nausea and vomiting. More seriously, they can occasionally provoke or worsen bleeding from the stomach. Occasionally aspirin can bring on an asthma attack. These harmful effects are not common, but because of them, anti-platelet drugs are not recommended as a way to prevent heart attacks or strokes in healthy people.

## Nitrates

Nitrates open up the blood vessels. They reduce the work of the heart and also help to widen the coronary arteries. Nitrates come in tablet or spray form, or as skin patches.

### GTN tablets

As soon as you get an attack of angina, place a glyceryl trinitrate (GTN) tablet under your tongue and let it dissolve. GTN tablets are not effective if you swallow them.

Or, you can take a tablet just before doing something that is likely to bring on your angina. However, you should only do this if you have previous experience of getting chest pain while doing that activity. It is not advisable to take your nitrates 'just in case' – unless you have specific instructions from your doctor to do so.

Keep your tablets in the container that they come in. The tablets lose their strength quite quickly and you should replace them with a fresh supply after eight weeks.

### GTN spray

Glyceryl trinitrate can be given in an aerosol spray (a GTN spray). You need to take one or two doses under your tongue and close your mouth after each dose. You don't need to shake the canister before spraying.

The spray has the advantage of having a longer lifespan than GTN tablets. You can keep it for up to two years.

**For advice on what to do if you get an angina attack, see page 6.**

### Oral nitrates

Some nitrates are used to prevent angina. These are sometimes given as tablets – for example, isosorbide mononitrate and isosorbide dinitrate.

### GTN skin patch

Self-adhesive skin patches containing glyceryl trinitrate are effective in relieving or preventing angina, but they may become less effective if they are used continuously for a 24-hour period. So, it may be helpful to leave the patches off for several hours in each 24-hour period. You can still use your spray or tablets under your tongue if you have an angina attack.

### Unwanted effects of nitrates

You can get a headache, flushing, dizziness and faintness with nitrates, but these side effects are most common with GTN tablets. These symptoms tend to reduce with continued use. If you are taking a long-acting nitrate (such as isosorbide mononitrate or isosorbide dinitrate), you should not take Viagra. Speak to your doctor if you are not sure about this.

## Beta-blockers

Beta-blockers act by slowing the heart rate. This reduces the amount of work the heart has to do, so that it needs less oxygen, blood and nutrients. Beta-blockers are very effective in preventing attacks of angina, but work too slowly to be useful in relieving an attack of angina.

Beta-blockers come in tablet form and you need to swallow them whole.

These drugs are not usually suitable for people with asthma or bronchitis. If you have diabetes, your doctor may prefer not to give you beta-blockers, as they may mask (hide) the symptoms of low blood sugar. However, so-called 'selective' beta-blockers have fewer effects on the lungs and are also less likely to mask the symptoms caused by low blood sugar.

### Unwanted effects

Serious side effects are rare if beta-blockers are used carefully. Minor side effects are common but they tend to lessen as time goes by. The minor side effects include tiredness, fatigue, and cold hands and feet. Other less frequent effects include feeling sick, diarrhoea, skin rashes, impotence, nightmares, and dizziness.

You should not stop taking beta-blockers suddenly without medical advice, because coming off them too quickly can make angina worse.

## Calcium channel blockers

Calcium channel blockers are used to reduce the frequency of angina attacks. If you have asthma or bronchitis, your doctor may prescribe calcium channel blockers rather than beta-blockers. Some doctors prefer calcium channel blockers for people who also have diabetes.

### Unwanted effects

Serious side effects are not common. Minor effects include flushing, headache, dizziness, faintness, swollen ankles, indigestion, feeling sick and vomiting.

## Potassium channel activators

Potassium channel activators have a similar effect to nitrates as they relax the walls of the coronary arteries and so improve the flow of blood to the heart. Unlike nitrates, they do not appear to become less effective if you keep using them.

### Unwanted effects

Unwanted effects of potassium channel activators may include a headache when you first take them, and also flushing, indigestion or dizziness. If you are taking a potassium channel activator, you should not take Viagra.

## Cholesterol-lowering drugs (lipid-lowering drugs)

You may be given cholesterol-lowering drugs (or lipid-lowering drugs) to reduce your risk of having a heart attack.

‘Blood lipids’ is the name for all the fatty substances in the blood, including **LDL cholesterol** (the harmful cholesterol), **HDL cholesterol** (the ‘good’ type of cholesterol), and **triglycerides**. The overall aim of using drugs to treat high blood cholesterol is to lower the total amount of cholesterol in the blood, and particularly to lower the amount of LDL cholesterol. (For more information on cholesterol and cholesterol-lowering drugs, see our booklet *Reducing your blood cholesterol*.)

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

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

There are other types of drugs which can be used when statins are not suitable. **Fibrates** are useful for people who have a high level of both blood cholesterol and triglycerides. **Nicotinic acid** can help to raise HDL – the good type of cholesterol.

**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 cholesterol from being absorbed in the small intestine.

### Unwanted effects of cholesterol-lowering drugs

Unwanted effects of cholesterol-lowering drugs can include feeling sick, vomiting, diarrhoea and headache.

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 drug you are taking, or the dose. Don’t stop taking the drug without speaking to your doctor about it first.

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

### Combinations of drugs

**Nitrates** and **beta-blockers** are often used together from the start of treatment. If they do not control the angina, a **calcium channel blocker** may be used as well.

## Coronary angioplasty and coronary bypass surgery

If your coronary arteries are narrowed and if your symptoms are not relieved by drugs, or if your angina is life-threatening, you may be advised to have:

- coronary angioplasty, or
- coronary bypass surgery.

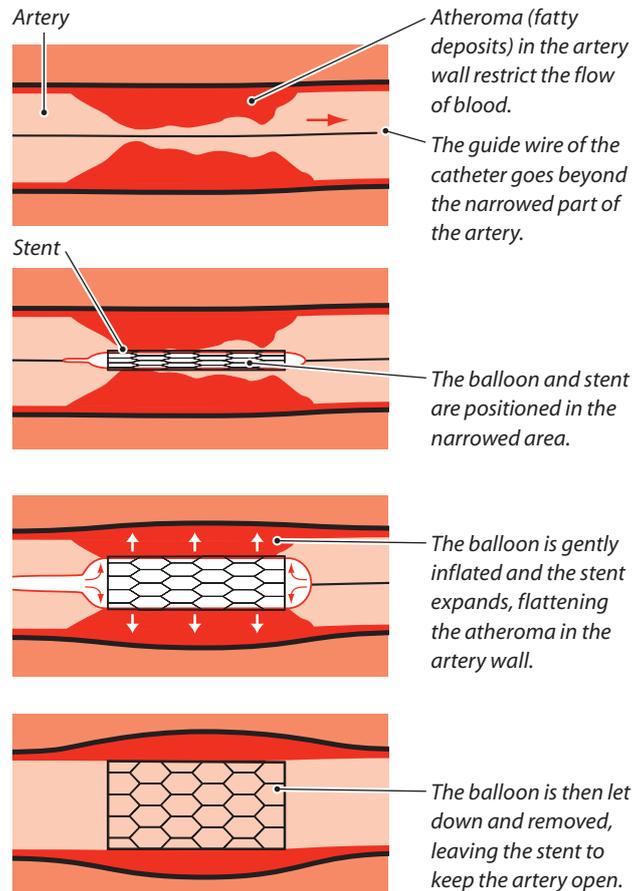
### Coronary angioplasty

If your coronary angiogram has shown a narrowing in an artery, you may be recommended to have a coronary angioplasty with stenting. This is a treatment which improves the blood supply to the heart muscle.

A **catheter** (a fine, flexible, hollow tube) with a small inflatable **balloon** at its tip is passed into an artery in either your groin or your arm. The operator then uses **X-ray screening** to direct the catheter to a coronary artery until its tip reaches the narrowed or blocked section. The balloon is then gently inflated so that it squashes the fatty tissue responsible for the narrowing. As a result, this widens the artery. (See the illustration opposite.)

Most balloons now contain a 'stent' which is a short tube of stainless-steel mesh. As the balloon is inflated, the stent expands so that it holds open the narrowed blood vessel.

### Coronary angioplasty with a stent



The balloon is then let down and removed, leaving the stent in place.

Coronary angioplasty with stenting will usually involve an overnight stay in hospital.

In the past, angioplasty was done without using stents, but stenting is now routine, unless the artery is not large enough to accept one, or if the artery is too big for the stent to have any effect.

There are some special types of stents called 'drug-eluting stents'. These are stents that are coated with a drug which can reduce the inflammation and cell growth that sometimes happen after a stent has been inserted. (The inflammation and cell growth can sometimes make the artery become narrow again.) Drug-eluting stents are only suitable for a particular type of narrowing – it depends on how wide and how long the narrowing is. Your cardiologist will tell you if they are suitable for you.

Using the stent reduces the risk of the artery becoming narrow again after the coronary angioplasty. However, the angioplasty can be repeated later if necessary.

For more information on coronary angioplasty, see our booklet *Coronary angioplasty and coronary bypass surgery*.

## Coronary bypass surgery

This is major surgery and you would need to stay in hospital for about a week. It has proved to be very effective in reducing the symptoms of angina and improving the outlook for patients with severe narrowing of the main coronary arteries.

The aim of the operation is to bypass (get around) narrowed sections of coronary arteries. The heart surgeon does this by grafting a blood vessel between the aorta (the main artery leaving the heart) and a point in the coronary artery beyond the narrowed or blocked area. (See the illustration on page 37.)

Doctors can carry out a bypass graft for each of the main coronary arteries affected. Most people have three, four or sometimes more grafts as the surgeon tries to do as thorough a job as possible to make sure that the operation lasts.

In most cases, at least one of the blood vessels used for the grafts is made using an artery from inside the chest called the internal mammary artery. The internal mammary artery is less likely to narrow over time than a vein graft.

Blood vessels from other parts of the body are used for the other grafts – usually from the leg or the arm, or both.

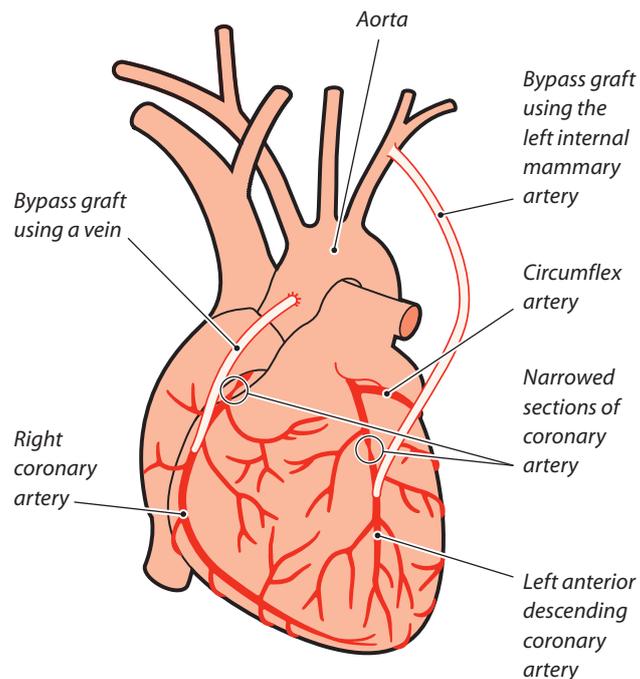
Before the decision is taken to operate, you will need to have a coronary angiogram (see page 17) to find out exactly which arteries are narrowed and where.

The traditional way of doing coronary bypass surgery is for the surgeon to make an incision (a cut) down the middle of the breastbone. However, some surgeons are now operating through smaller wounds.

After the operation, you will have a scar down the length of your breastbone. You are bound to feel discomfort in your chest immediately after surgery, but this usually eases off over the next few weeks. If a vein has been removed from your leg, you will also have some discomfort and swelling there. Most people are sitting out of bed a day or two after the operation, and return home in about a week. Most people can return to work two or three months after the surgery.

For more information on coronary bypass surgery, see our booklet *Coronary angioplasty and coronary bypass surgery*. For information on what happens in hospital before and after the operation, see our booklet *Having heart surgery*.

## Coronary bypass surgery



## Coronary angioplasty or coronary bypass surgery for angina?

For some people, a coronary bypass operation is the only option. But, if you are suitable for either coronary angioplasty or coronary bypass surgery, you can be offered a choice. There are advantages and disadvantages to both procedures. You will need to make a decision with the help and support of your doctor. Angioplasty avoids the need for a major operation. However, people who have an angioplasty may be more likely to get angina again than those who have bypass surgery, so they may be more likely to need further treatment or heart surgery later.

For more information on the advantages and disadvantages of angioplasty and bypass surgery, see our booklet *Coronary angioplasty and coronary bypass surgery*.

## What can I do to help prevent angina attacks?

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If you have angina, there are several things you can do to prevent your angina from getting worse or progressing to the point where you have a heart attack or need surgery.

### If you smoke, stop smoking

Smoking is a major cause of coronary heart disease, especially among younger patients. Smoking cigarettes is particularly dangerous, but pipe and cigar smoking also increase the risk. Within one year of stopping smoking, the risk of having a heart attack falls to about half that of a smoker.<sup>1</sup>

For practical help in stopping, contact **QUIT** on **0800 002200** or visit their website **[www.quit.org.uk](http://www.quit.org.uk)**, or write to them at QUIT, 211 Old Street, London EC1V 9NR. Your GP can also give you advice, including information on nicotine replacement products such as chewing gum, skin patches, and tablets.

## Control high blood pressure

High blood pressure is one of the causes of coronary heart disease, and it also makes the heart work harder. If you have high blood pressure, it is essential to control it. The goal for people with angina is to have a blood pressure **below 130/80 mmHg**.<sup>2</sup> (mmHg stands for millimetres of mercury.) Sometimes people can achieve this by losing weight, increasing physical activity, and cutting down on alcohol and salt. However, most people also need to take tablets to lower their blood pressure. (For more information on high blood pressure, see our booklet *Blood pressure*.)

## Know your cholesterol

The level of cholesterol in your blood will be measured. The goal for people with angina and for people at high risk of developing angina is to have a total cholesterol level of **under 4 mmols/l**.<sup>2</sup> (mmols/l stands for millimols per litre.) If your blood cholesterol is even slightly above the desirable level, you can greatly benefit from reducing it.

A **healthy diet** will help. This means cutting down on fats in general, especially saturated fats which are found mostly in meat and dairy products. Beware of the 'hidden fats' in cakes and biscuits too. Replace fatty foods with starchy foods such as pasta, bread and potatoes.

For more information on healthy eating see our booklets *Eating for your heart*, *Reducing your blood cholesterol* and *Food should be fun ... and healthy*.

In practice most people with angina need drugs to achieve the low levels of blood cholesterol which are known to bring the greatest benefit.

## Fish and fish oils

**Eat oily fish regularly** – for example, herring, mackerel, pilchards, sardines, salmon, trout and fresh tuna. These fish provide the richest source of omega-3 fats which can help to lower blood triglyceride levels and help prevent the blood from clotting.

Aim to have 2 portions of fish a week. 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.<sup>3</sup>

## Eat more fruit and vegetables

There is good evidence that eating a diet that includes a wide range of fruit and vegetables lowers the risk of coronary heart disease.<sup>4</sup> Aim to have **at least 5 portions of fruit and vegetables a day**.

We don't know exactly why fruit and vegetables have this good effect. It seems to be due to the **antioxidants** in the fruit and vegetables.

Antioxidants prevent 'oxidation' – the chemical process which allows cholesterol to form atheroma within the coronary artery walls (see page 9). However, there is no evidence that taking vitamin tablets or supplements have the same benefits as eating fruit and vegetables.

## Control your weight

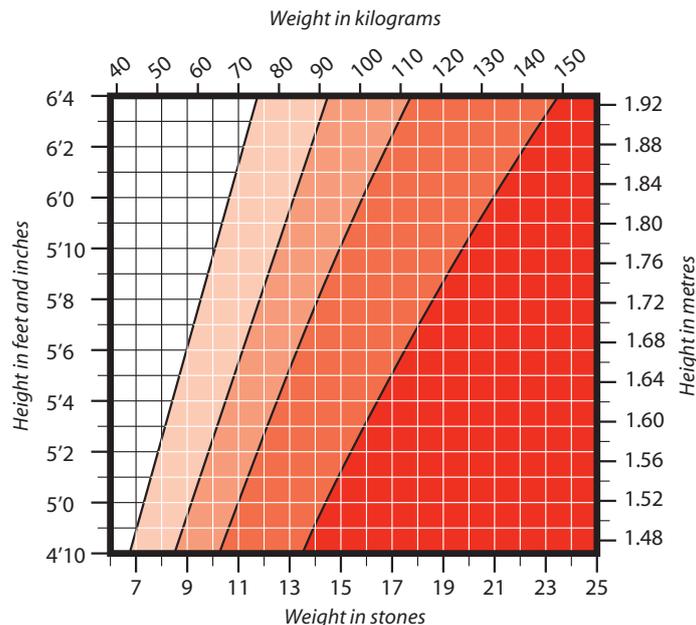
By keeping close to the recommended weight for your height, you will keep your blood pressure down and reduce the amount of work your heart has to do. Remember that losing weight involves both eating healthily and increasing physical activity.

To find out if you need to lose weight, check the chart on the next page. If you fall in the overweight, obese or very obese category, you need to lose some weight.

For more information on how to lose weight, see our booklet *So you want to lose weight... for good. A guide to losing weight for men and women.*

## Are you a healthy weight?

Take a straight line across from your height (without shoes), and a line up or down from your weight. Put a mark where the two lines meet to find out if you need to lose weight. This is only an approximate guide.



□ Underweight   □ OK   □ Overweight   □ Obese   □ Very obese

Adapted from *Treat Obesity Seriously*, by J Garrow. 1981.  
By permission of Churchill Livingstone.

## Be more physically active

Physical activity can help keep your heart healthy and it helps keep your weight down. Also, most people feel generally better when they are fit.

If you have angina, it is important to keep exercising, but it should be within the limits of your angina or breathlessness. A good guide is that you should be able to 'walk' and 'talk'. If you are too breathless to talk, you should stop and take a break.

The type of activity recommended for the heart is moderate, rhythmic (aerobic) exercise such as brisk walking, cycling or swimming. Walking and cycling are particularly good as you can often build them into your daily routine.

Intense (isometric) exercise such as weightlifting and press-ups are not recommended. And highly competitive sports such as squash may be dangerous if you have a heart condition.

If you have angina, you need to find out what you can easily manage and then gradually increase the amount of activity you do. It may be helpful to plan a weekly exercise programme based on walking. Choose a walking distance that you know you can cover easily without getting angina. Make this your target. Do this amount twice a day for the next two days. Each time, assess whether the

activity was easy or difficult. If it was fairly easy or easy, very gradually increase the distance each day for the next two days. If the activity was difficult, limit yourself to a shorter distance until you find it easy.

Make sure that you are able to do the activity before increasing your target. And keep your activity regular, frequent, and within rather than beyond your limits.

### What sort of physical activity can I do?

#### Activities that are good for the heart

Moderate, rhythmic (aerobic) exercise such as brisk walking, cycling or swimming.

Any regular physical activity that you are used to doing, unless your doctor advises you against it.

#### Activities to avoid

Intense (isometric) exercise such as weightlifting and press-ups.

Any sport or activity that brings on angina.

Starting exercise or physical activity soon after a heavy meal.

Holding your breath when stretching.

Moving from floor to standing exercises too quickly.

## Reduce stress

If you have angina, it is important to learn how to relax. Some people find that yoga or other relaxation techniques help. You also need to identify situations that make you feel stressed at home or at work and try to avoid them if you can. For more information on how to deal with stress, see our booklet *Stress and your heart*.

### 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 – for example how you are getting on with giving up smoking, reducing your blood pressure, losing weight or reducing your cholesterol. 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 yourself from the British Heart Foundation (see page 53), and work through it with your health professional.

## Everyday life with angina

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### Work

After treatment, most people with angina can get back to a normal or near normal life. However, if you have a very demanding job, you may need to rearrange your commitments. For example, can you plan your work better? Do you do unnecessary and stressful things? If your job involves heavy manual work, you may need to ask your doctor if it is likely to bring on angina. For more information, see our booklet *Returning to work with a heart condition*.

### Driving

If you drive a car and you have angina that is well controlled, you will not usually be restricted. You don't need to let the Driver and Vehicle Licensing Agency (DVLA) know about your angina. However, you do need to tell your motor insurance company about it. If you don't, your insurance may not be valid. There should be no problem getting insurance cover as long as you get a note from your doctor to say that you are fit to drive.

If you ever have an attack of angina while you are driving, you should stop driving. Once your symptoms are controlled, you can start driving again.

If you have a licence to drive a large goods vehicle (LGV) or passenger-carrying vehicle (PCV), you must contact the Driver and Vehicle Licensing Agency (DVLA, Swansea SA99 1TU) and tell them about your angina. This is because special regulations apply to drivers of these vehicles. You may be given a licence again after six weeks, but only after a successful exercise test and a satisfactory report from your cardiologist.

## Holidays and travel

Holidays are important and recommended. Organise your journey carefully and allow plenty of time. Take enough tablets for your trip and carry some in your hand luggage. Avoid rushing and carrying heavy pieces of luggage.

Air travel should not be a problem. However, if you cannot walk at least 100 yards briskly on the flat without angina or undue breathlessness, you should talk to your doctor before deciding to fly. Take a rest in the airport lounge so that you are less likely to get angina as you walk to the departure gate. If you think your angina may be brought on by the hectic activity of an airport, ask the airline or your travel agent for a medical form to ask the airline for extra help such as early boarding or a wheelchair.

You should avoid holidays at high altitudes, especially if your angina is brought on easily, or if you suffer from breathlessness.

The National Health Service does not pay for treatment while you are out of the UK. If you are travelling to a European Union country or to Switzerland, you will need to get a **European Health Insurance Card (EHIC)**. This entitles you to reduced-cost, sometimes free, medical treatment that you may need while you are away. You can get an application form for the card from your local post office, or apply online at [www.ehic.org.uk](http://www.ehic.org.uk). In countries that do not have a special arrangement with the UK, you will need private health insurance. You can arrange this through your travel agent or insurance broker. For a list of 'heart-friendly insurers' call the British Heart Foundation **Heart Information Line** on **08450 70 80 70**.

## Sex

Many people who have angina continue to enjoy sex. In general, if you can briskly climb up and down two flights of stairs without getting any angina symptoms, then sex will not usually bring on your angina. If sex does bring on an attack, taking a GTN tablet beforehand will usually prevent an attack.

To reduce the chance of having angina symptoms during sex, wait at least two hours after a meal or a hot bath, and make sure the room is comfortably warm. Symptoms may also be less likely if you have sex after a good night's sleep.

### Changes you should tell your doctor about

Contact your doctor:

- if your angina attacks become more frequent or severe (which is especially important if you get angina while you are resting); or
- if your GTN tablets or spray seem to become less effective.

## For more information

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### 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 62 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 and rehabilitation
- 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

## 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 600 6566**.

## 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

<b>angiogram</b>	See 'coronary angiogram'.
<b>angiography</b>	See 'coronary angiography'.
<b>angioplasty</b>	See 'coronary angioplasty'.
<b>atheroma</b>	Fatty material that can build up within the walls of the arteries.
<b>atherosclerosis</b>	The build-up of fatty material within the walls of the arteries.
<b>beta-blocker</b>	A drug that slows the heart rate.
<b>bypass surgery</b>	See 'coronary bypass surgery'.
<b>calcium channel blocker</b>	A drug that blocks calcium from entering the muscles, allowing the blood vessels to widen.
<b>catheter</b>	A fine, flexible, hollow tube.
<b>coronary angiogram</b>	A picture which shows where the coronary arteries are narrowed and how narrow they have become.
<b>coronary angiography</b>	A test to show where the coronary arteries are narrowed and how narrow they have become.
<b>coronary angioplasty</b>	A treatment to improve the blood supply to the heart muscle.
<b>coronary bypass surgery</b>	An operation to bypass narrowed sections of coronary arteries and improve the blood supply to the heart.

<b>coronary heart disease</b>	When the walls of the arteries become narrowed by a gradual build-up of fatty material called atheroma.
<b>CT scan</b>	CT stands for computed tomography. A CT scan is type of scan used for looking at the organs in your body, such as your heart or lungs.
<b>ECG</b>	See 'electrocardiogram'.
<b>electrocardiogram</b>	A test to record the rhythm and electrical activity of the heart. Also called an ECG.
<b>GTN tablet</b>	A drug that opens up the blood vessels. GTN stands for glyceryl trinitrate.
<b>MRI scan</b>	MRI stands for magnetic resonance imaging. An MRI scan is a detailed picture of internal organs of the body, which is produced using a magnetic field and radio waves.
<b>nitrate</b>	A drug that opens up the blood vessels.
<b>radioisotope scan</b>	A test which provides pictures of the heart.
<b>stable angina</b>	Angina that comes on with a particular amount of exercise.
<b>stent</b>	A small support frame placed inside the artery during coronary angioplasty.
<b>unstable angina</b>	Angina that comes on with less and less physical activity, or even while the person is resting.

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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://bhf.org.uk/contact). Or, write to us at the address on the back cover.

### What you can do for us

We rely on donations to continue our vital work. If you would like to make a **donation** to the British Heart Foundation, please ring our **credit card hotline** on **0870 606 3399** or contact us through our website at [bhf.org.uk/donate](https://bhf.org.uk/donate) or send it to us at the address on the back cover.

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Edited by Wordworks.



## 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.



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