

## Patient information from the BMJ Group

# Angina, stable

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## Angina, stable

Angina is the discomfort or pain you feel, usually in your chest, when your heart isn't getting enough oxygen. If you get angina, you may worry about how much you can do and what will happen to you. But there are good treatments that can help stop your angina attacks and help you stay active.

We've brought together the best research about angina and weighed up the evidence about how to treat it. You can use our information to talk to your doctor and decide which treatments are best for you. To read about unstable angina and its treatments, see [Angina, unstable](#) .

## What is angina?

Angina is the name that doctors use for the discomfort or pain you feel, usually in your chest, when your heart isn't getting enough oxygen. You usually get angina when you are active and it goes away when you rest.

If you get angina, taking medicine and changing your lifestyle can help you have fewer and milder attacks. But getting angina is also a warning that you could have a heart attack. So, your doctor will also talk to you about treatments to lower your chances of having a heart attack.

There are different types of angina. We've looked at treatments for the most common type, called stable angina. To read about the other types, see [Other types of angina](#) .

## Key points for people with angina

- Angina is usually caused by a condition called **coronary artery disease**.
- People often describe angina as a discomfort, an ache, or a burning or heavy sensation, rather than a pain.
- People usually get angina in their chest, but you can also get it in your back, arm, jaw, or throat.
- It's usually brought on by doing something active or by stress.

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- You should see your doctor to check out all chest discomfort or pain, even if it goes away.
- If you do have angina, your doctor can start you on treatment to stop the angina attacks and help you have fewer of them. He or she will probably also suggest medicine to lower your risk of a heart attack.
- A few changes to your lifestyle also will lower this risk. If you smoke, now is the time to stop.
- Learn to recognise what brings on your angina and what makes it go away. If it lasts for longer than usual or the pattern changes, go to hospital straight away. You may be having a heart attack.

## Your heart and how it works

To understand what happens when you have angina, it helps to know something about your heart and how it works. <sup>[1]</sup>

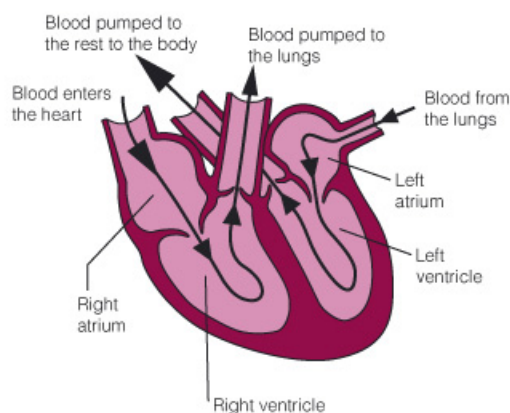
Your heart is in the middle of your chest. It is a muscle shaped like a fist. It works automatically so you don't have to think about making it beat.

Your heart works like a pump. Every time it beats, it pushes blood around your body. Blood carries oxygen and food (nutrients) to your cells. The cells in your body will die if they don't get a constant supply of both. To read more, see [How your heart moves blood around your body](#) .

Your heart works harder, and for longer, than any other organ in your body. If your heart stops working, every other part of your body will die within minutes.

### The parts of your heart

Your heart has thick muscular walls. It's divided into two sides, right and left. Each side has an upper part and a lower part. Doctors call these **chambers**.



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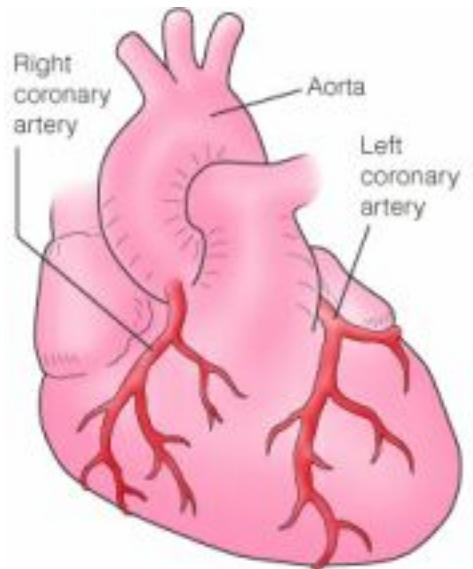
Your heart works like a pump.

The two chambers on the right side of your heart pump blood to your lungs, where the blood picks up oxygen. Blood then returns to the two chambers on the left side, which pump the blood to the rest of your body, taking oxygen and food to your cells.

The two upper chambers of your heart are called the **right atrium** and the **left atrium**. The two larger chambers in the lower part of your heart are called the **right ventricle** and the **left ventricle**.

For more, see [What happens when your heart beats](#) .

### How your heart gets its own supply of blood



Coronary arteries bring your heart the blood it needs.

To do its job, your heart needs its own supply of blood. The blood carries oxygen to your heart's cells, so that it can do its work.

Your heart gets this blood from your **coronary arteries**. They supply the heart's muscular wall with blood that is rich in oxygen.

Your **left coronary artery** has two main branches.

- One is called the **left anterior descending artery** (or LAD for short). It supplies most of the blood to your left ventricle, the part of your heart that pumps blood out to your body. This job makes this artery very important to your health.
- The other one is called the **left circumflex artery**.

Your **right coronary artery** is smaller. Its branches carry blood to the back of your heart. These arteries split into a network of smaller vessels that take blood deeper into your heart muscle.

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For more, see [How blood moves through your heart](#) .

### What happens if you have angina

People usually get angina because of a condition called **coronary artery disease**. This is when clumps of fatty tissue (called plaques) build up on the smooth lining inside a coronary artery. Over time, they make your artery narrower, stiffer, and rougher.

The build-up of fatty clumps is called **atherosclerosis** . It's very common. It can happen in arteries anywhere in your body. If you have atherosclerosis in your coronary arteries, you have coronary artery disease. You may hear doctors call this ischaemic heart disease, coronary heart disease, or coronary vascular disease.

Any of your coronary arteries can be affected in angina. And you can have narrowing in just one artery or in all of them.

If your coronary arteries are narrow, it means that not enough blood gets through to your heart when it has to work harder. And not enough blood means not enough oxygen. This is what causes the symptoms of angina.

Lots of things can make your heart work harder and bring on angina. For example, the discomfort or pain can start when you walk up a hill, go up stairs, or garden. Eating a heavy meal or going out in cold weather can bring it on too. It's also likely to start when you get angry, upset, or excited. People usually feel the angina in their chest, but you can also feel it in your back, shoulder, throat, arm, or jaw. <sup>[2]</sup>

When you are at rest, or calmer, your heart doesn't have to work so hard. So it has enough oxygen for its needs, and you don't feel the discomfort.

In many ways, angina is like the muscle cramp in your arm or leg that you can get after exercise. It means the working muscle isn't getting as much blood as it needs. That's why angina warns you to stop and rest for a few minutes or calm down a bit.

We have looked at angina caused by **coronary artery disease**. Some people have angina that is caused by another condition that stops their heart getting enough oxygen. For more, see [Other causes of angina](#) . If your angina is caused by something else, talk to your doctor about how it should be treated.

There are different types of angina too. <sup>[3]</sup> On these pages, we look at the most common type. Doctors call this **stable angina**. For more on the others, see [Other types of angina](#) .

Stable angina has a regular pattern to it. You get it when your heart is working harder than usual, and it goes away after you rest for a few minutes or take your angina medicine. After several bouts, you learn to recognise the pattern and know when it will happen. Doctors say you have stable angina when you've had such symptoms for more than two months.

### Angina: why me?

We don't know exactly why fatty clumps (plaques) build up in some people's arteries and cause angina. But we do know that some things make it more likely that you will get coronary artery disease and angina. Doctors call these things risk factors. Having a risk factor doesn't mean you'll get angina for sure. It just means you are more likely to get it than someone who doesn't have that risk factor.

The risk factors for angina are the same as the risk factors for heart disease. We've listed the main ones below. <sup>[2]</sup> <sup>[5]</sup> <sup>[6]</sup>

- Being male
- Being middle-aged or older
- Having heart attacks run in your family
- Smoking
- Having high cholesterol
- Having high blood pressure
- Being overweight or obese
- Not taking enough exercise
- Having diabetes .

The more risk factors you have, the more likely you are to get angina. But you and your doctor can work together to make some of these risk factors less dangerous. This can reduce the chances that your angina will get worse and that you will have a heart attack.

You can't do anything about some risk factors, like conditions that run in your family or getting older. But you can do something about others, like smoking. If you smoke, now is the time to stop. And eating better and exercising will both help.

Being under stress can affect some risk factors. For example, if you're stressed, you might eat or smoke more than usual. We don't know if stress by itself makes it more likely that you'll get angina. <sup>[1]</sup>

For more on steps you can take to stay as healthy as possible, see [What you can do to help yourself](#) .

You can also get good treatments for some of the things that put you at risk of getting angina. For more, see our articles on:

- [Type 1 diabetes](#) or [type 2 diabetes](#)

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- [High blood pressure](#)
- [High cholesterol](#)
- [Obesity](#)
- [Smoking](#) .

### What are the symptoms of stable angina?

Angina feels like a discomfort or pain, usually in your chest. It usually starts when you do something active and goes away when you rest.

Angina affects different people in different ways. Here's a list of the most common ways people describe how it feels. <sup>[6]</sup> <sup>[2]</sup>

- It can feel like a weight on your chest or a squeezing, crushing, or gripping sensation.
- Some people say it's more of a discomfort than a pain, or more of a feeling of pressure or strangling. <sup>[8]</sup>
- The feeling is usually in the middle of the chest, spreading out to both sides.
- But you can also get it in your neck and jaw, or less often in your back. Or it may go down one or both of your arms and make them feel heavy.
- You may feel as if you have indigestion.
- The pain might also start somewhere else and only later spread to your chest.
- You may be breathless and sweaty. Or you may feel sick or exhausted. Sometimes being breathless is the only symptom.
- But some people have only a slight discomfort. And others don't get any discomfort at all. They just feel that they have to stop whatever they're doing, like walking.
- You may also feel uneasy and anxious.

If you have stable angina, the discomfort or pain usually starts when you do something active, like walk up a hill, go up stairs, or do some gardening. It can also start when you eat a heavy meal, go out in cold weather, or get angry, upset, or excited.

You get symptoms regularly and you usually know when they're going to happen because of what you are doing. (In another type of angina, called **unstable angina**, you get symptoms while doing less. You can even get symptoms when you're not doing anything. To learn more, see [Other types of angina](#) .)

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How much activity it takes to bring on an attack can vary a lot, even in the same person. For example, you may find that you can do a lot less in the early mornings. And you may find that only a little exercise brings on an attack, but that after a rest you can do much more.

Usually, the discomfort of angina goes away when you stop and rest. It typically lasts between one minute and three minutes. It may take longer to go away after you've been angry or upset. If you have discomfort that lasts only a few seconds or a dull ache lasting for hours, it's probably not angina. <sup>[2]</sup>

Not everyone's angina is the same. But your angina will have a similar pattern every time you have an attack. It's important to recognise what brings on your angina and what your pattern is like. This will help to treat it. And it will help you tell if something more serious is happening.

Tell your doctor about any changes in the pattern of your angina. Your medicine may need adjusting or you may need more tests. And get medical help straight away if your discomfort or pain:

- Comes on more often than usual
- Lasts for longer than usual
- Comes on when you are resting or in bed
- Is worse than usual
- Doesn't go away, even after you've taken your [angina medicine](#) under your tongue three times.

These may be signs that you will have a heart attack soon.

Pain in your chest isn't always angina. Sometimes you get chest pain from conditions that don't affect your heart. But only your doctor can say for sure, so be sure to get it checked out. For more, see [Other causes of chest pain](#) .

### How do doctors diagnose stable angina?

To find out if you have angina, your doctor will ask you some questions about your chest discomfort or pain and your health. He or she will also examine you and will probably suggest some tests.

It isn't always easy to diagnose angina because there are so many other causes of chest pain. Here are some things your doctor might do to work out if you have angina.

### Questions your doctor might ask

Your doctor might ask you these questions.

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- How would you describe the discomfort or pain you feel?
- What brings on this feeling?
- How long does it last and what makes it go away?
- Is there a regular pattern to it, and can you tell when it will happen?
- How long have you had it, and is it getting any worse?
- Do you smoke?
- Does **heart disease** run in your family?
- Do you have **high blood pressure** ?
- Do you have **high cholesterol** ?
- Do you have **diabetes** ?
- What kind of work do you do?
- What kinds of foods do you eat?

If there is any doubt about what is causing your discomfort or pain, your doctor will ask you more questions. For more, see [Other causes of chest pain](#) .

### Physical examination

Your doctor will give you a physical examination to learn more about what could be causing your symptoms. Here are some things he or she might do.

- Measure your **blood pressure** and feel your **pulse** . Your pulse tells your doctor how fast your heart is beating and if the beat is regular.
- Listen to your heart, especially for any extra noises called **murmurs**. These can be a sign of a problem with your heart valves. Sometimes valve problems can cause angina.
- Listen to the blood flowing through the **arteries** in your neck to see if there are any extra noises. These noises could mean that your arteries are narrowed.
- Look for bumps under your skin that are a sign of **high cholesterol** . For example, you might have firm white bumps around your eyes. High cholesterol can put you at risk for narrowing of your arteries.



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- Listen to your lungs for any extra noises while you breathe. These could be caused by lung disease or by heart failure . You can get heart failure if your heart doesn't pump well because it is damaged.
- Measure your height and weight to work out if you are overweight. If you are overweight, this puts an extra strain on your heart.
- Check for less common causes of angina. For example, your doctor will look for signs of anaemia and an overactive thyroid gland . Both can cause angina. For more, see [Other causes of angina](#) .
- Check for causes of chest pain that don't have anything to do with your heart. For more, see [Other causes of chest pain](#) .

If you do have angina, your doctor will also try to find out what type you have. We have looked at treatments for the type called stable angina. But there are two other types, called unstable angina and variant (Prinzmetal's) angina. For more, see [Other types of angina](#) .

### Tests

Your doctor may suggest you have some of these tests.

#### An electrocardiogram (ECG)

The first test your doctor will suggest is an electrocardiogram, or ECG for short. The ECG shows the electrical activity in your heart as a line on a graph. This test helps your doctor tell if your heart is beating properly and if you have certain heart problems. For more, see [Tests for angina](#) .

#### Blood tests

Your doctor will also suggest some blood tests. These can help tell if you have anaemia , diabetes , or high cholesterol . If your doctor thinks you might have an overactive thyroid gland , you'll need a blood test for that too.

#### An x-ray

You will need an x-ray of your chest if your doctor thinks you might have lung disease or heart failure .

#### A trial of treatment

Your doctor might try giving you a treatment for angina to see if it takes away your discomfort or pain. The treatment is called [glyceryl trinitrate](#) (GTN for short).

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### A stress test

Your GP or a doctor who specialises in heart problems (a cardiologist) may set up a stress test. This test shows how much stress your heart can take before it is under too much strain. For more, see [Tests for angina](#) .

### Seeing a cardiologist

A cardiologist can set up any more tests you need. Here's a list of some that he or she may suggest. <sup>[3]</sup>

- **A stress test:** Your cardiologist may suggest this test if your doctor hasn't already.
- **An echocardiogram:** This test uses sound waves to make a picture of your heart. It's sometimes called an 'echo' for short. The picture shows how blood flows through your heart and if your heart is pumping properly, among other things.
- **Coronary angiography:** This test uses a dye to make your coronary arteries show up on an x-ray. It can show blockages.

For more, see [Tests for angina](#) .

### How common is angina?

Angina is very common. And it's more common in men than in women.

Angina affects about 2 million people in the UK. <sup>[9]</sup> Around 8 in 100 men and 3 in 100 women aged 55 to 64 have (or have had) angina. For people aged 65 to 74, these numbers go up to 14 in 100 for men and 8 in 100 for women. <sup>[9]</sup> We don't know exactly how many of these people have stable angina and how many have [unstable angina](#) , but stable angina is more common. Although older people are most likely to get angina, younger people can get it too.

Angina is usually a symptom of **coronary artery disease**. That's the most common cause of death in the UK. This disease kills more than 80,000 people every year in the UK. <sup>[9]</sup>

The number of people with angina is going up, as are the numbers of people with [obesity](#) and [diabetes](#) . Both obesity and diabetes can make you more likely to get coronary artery disease, which causes angina.

### What treatments work for stable angina?

Angina is the discomfort or pain you feel, usually in your chest, when your heart isn't getting enough oxygen. You usually get angina when you do something active, and it goes away when you rest.

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Here we look at treatments for the most common type of angina. Doctors call this **stable angina** because it has a regular pattern to it. We also have a section on [unstable angina](#).

There are good treatments that can relieve the discomfort or pain of an angina attack, cut your number of attacks and help you get on with your life. Your doctor will also suggest treatments to stop your angina and heart disease getting worse and to lower your chances of having a heart attack.

### Key points about treating angina

- Tablets or a spray you put under your tongue can give you quick relief from an angina attack. This medicine is called **glyceryl trinitrate** (GTN for short). It is a type of drug called a **nitrate**.
- If you plan to do something that usually brings on your angina, you can take this medicine first to stop you getting an attack.
- If you get angina often or it bothers you a lot, you'll need to take tablets regularly to keep the symptoms at bay.
- Drugs called **beta-blockers** can help you have fewer angina attacks and stay active. They are usually the first treatment doctors give for stable angina.
- Other types of medicines called **calcium channel blockers** and **nicorandil** also work for angina. You might also be offered other nitrates besides GTN, or newer medicines called **ivabradine** and **ranolazine**.
- If you still have symptoms while taking one drug, your doctor may recommend taking a second drug as well. For many people, taking two medicines works better than taking just one.
- If your angina is bad, you might need surgery to get more blood going to your heart. Your doctor may suggest types of surgery called coronary angioplasty or coronary artery bypass.
- To stop angina attacks coming on, you may also need to learn to slow down, handle stress, and make other changes to your lifestyle. For more, see [What you can do to help yourself](#).

We've carefully weighed up the research on treatments for stable angina. Your doctor will help you choose the best one to start with. Later, you may need a second treatment, depending on how well the first one works.

For help in deciding which treatment is best for you, see [How to make the best decisions about treatment](#).

## Treatment Group 1

### Treatments for stable angina

#### Treatments that are likely to work

- [Beta-blockers](#) : These are drugs that make your heart beat more slowly, so it doesn't have to work so hard. Some examples (with brand names) are atenolol (Tenormin), metoprolol (Lopresor), and propranolol (Inderal). [More...](#)
- [Calcium channel blockers](#) : These are drugs that make your heart beat more gently. Some examples (with brand names) are diltiazem (Adizem, Dilzem, Tildiem), felodipine (Plendil), nifedipine (Adalat, Coracten SR), and verapamil (Cordilox, Univer). [More...](#)
- [Nitrates](#) : These drugs widen your heart's blood vessels. They come as tablets, sprays, patches and ointment. Some examples (with brand names) are isosorbide dinitrate (Isoket Retard) and isosorbide mononitrate (Elantan, Imdur, Ismo). You can get glyceryl trinitrate (GTN for short) as a tablet or spray for under your tongue to quickly relieve an angina attack. Brand names for the spray include Coro-Nitro Pump spray, Glytrin spray, and Nitrolingual Pumpspray. [More...](#)
- [Nicorandil](#) : This drug widens your blood vessels. The brand name is Ikorel. [More...](#)

#### Other treatments

We haven't looked at the research on these treatments in as much detail as we've looked at the research on most of the treatments we cover. (To read more, see Our Method.) But we've included some information because you may have heard of them or be interested in them.

- [Aspirin](#) : If you have angina, your doctor will probably tell you to take a small dose of aspirin every day. Taking aspirin can lower your risk of having a heart attack. [More...](#)
- [Coronary angioplasty](#) : This is a procedure that widens narrowed coronary arteries. This makes it easier for blood to flow to your heart. [More...](#)
- [Coronary artery bypass graft](#) : A heart surgeon takes parts of healthy blood vessels from another part of your body and uses them to take over from the narrowed arteries in your heart. [More...](#)
- [Ivabradine](#) : This medicine helps to slow your heart rate down, so your heart doesn't have to work so hard. Its brand name is Procoralan. [More...](#)
- [Ranolazine](#) : This medicine is used in addition to other angina medicines. It helps your heart use oxygen more effectively. Its brand name is Ranexa. [More...](#)

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### Treating other medical conditions

As well as treating your angina, your doctor may suggest you have treatment for other conditions that affect the health of your heart. If you have angina, it's probably because you also have **coronary artery disease**. This means the arteries that carry blood to your heart are narrowed by fatty deposits. Your doctor might recommend drugs or surgery to treat coronary artery disease. For more, see [Living with angina](#) .

Your doctor may also suggest starting treatment or revising your treatment for:

- [High blood pressure](#)
- [High cholesterol](#)
- [Type 1 diabetes](#) or [Type 2 diabetes](#)
- [Obesity](#) .

You might also want to talk to your doctor about giving up [smoking](#) .

### What will happen to me?

If you've been told you have angina, you may feel anxious about your future and worry that you could have a heart attack.

The good news is that with treatment, many people with angina can live for a long time. <sup>[10]</sup> And making some changes in the way you live, such as stopping smoking and eating sensibly, can also help you live longer and stay in good health. For more, see [What you can do to help yourself](#) .

The bad news is that having angina probably means that you have **coronary artery disease**. With this disease, the arteries that carry blood to your heart are narrowed, so less blood can get through. If an artery gets badly blocked, you can have a heart attack. Having angina means you are more at risk of having a life-threatening heart attack. <sup>[11]</sup>

One study looked at men aged 42 to 65 who had recently started having angina but who had not had a heart attack. <sup>[12]</sup> Here's what it showed.

- Five years later, nearly 90 in 100 men with angina were alive. This compared with 96 in 100 men who didn't have signs of coronary artery disease.
- Ten years later, slightly more than 70 in 100 men with angina were alive. This compared with slightly more than 90 in 100 men who didn't have signs of coronary artery disease.

Getting a diagnosis of angina gives you some warning that you have coronary artery disease, so you and your doctor can do something about it. Only one-third of people with

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the disease get this warning.<sup>[13]</sup> One-third die suddenly (from a condition called sudden cardiac death). And one-third get a heart attack without any warning

The outlook for you depends on many things, including how badly your arteries are narrowed. For example, the outlook is good if you don't need surgery. On average, each year only 1 in 100 to 2 in 100 people with heart problems, such as angina, who don't need surgery die from a heart attack; and a further 2 in 100 to 3 in 100 have a heart attack but get better.<sup>[14] [15] [16] [17]</sup>

But some people with angina are more likely to have a heart attack. Here are some things that can increase your risk of having one.

- You are a man.<sup>[18]</sup>
- You get angina without much exercise. A stress test may show this. About one-third of people with stable angina who are sent to hospital get angina without much physical activity.<sup>[19]</sup> For more on stress tests, see [Tests for angina](#) .
- You have an abnormal electrocardiogram (ECG for short) while you are resting.<sup>[20]</sup> About half of people with stable angina have this.<sup>[21]</sup> For more on ECGs, see [Tests for angina](#) .
- You have had a heart attack in the past.<sup>[11]</sup>
- Your heart isn't pumping well, especially on the left side. In this case, you might also get breathless very easily and have **heart failure** .<sup>[19]</sup>
- You have narrowing of the main **coronary artery** going to the left side of your heart. Or you have narrowing of all of your coronary arteries.<sup>[13] [19]</sup>
- You have other factors that make your risk higher, such as smoking, **high blood pressure** , **diabetes** , or **high cholesterol** .<sup>[22] [23] [8]</sup>
- Your angina is getting worse or the pattern is changing.<sup>[2]</sup>

If you're at higher risk for a heart attack, you need to find out early so that you can get the best treatment straight away.

Taking medicines and making healthy changes to your life will help you avoid having a heart attack. Your doctor may also suggest you consider one of two operations. These are [coronary angioplasty](#) and [coronary artery bypass graft](#) . Both operations help improve the flow of blood to your heart.

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### How will angina affect my life?

You may worry about doing your usual activities or enjoying life as normal. But with the right treatment, many people with angina carry on with the things they enjoy.

#### Work

Having angina can affect certain kinds of work. For example, you may no longer be able to do a job that involves running heavy machinery or driving certain kinds of vehicles. Contact the Driver and Licensing Authority (DVLA) for further information ( <http://www.dvla.gov.uk> ).

#### Driving

You should still be able to drive, as long as your angina is under control. You don't need to tell the DVLA about your angina. But you do need to tell your motor insurance company.

#### Sex

You may worry that having sex will bring on your angina. But most people can still enjoy sex.

If you're taking medicines called [nitrates](#) or a drug called [nicorandil](#) , you shouldn't take certain drugs for erection problems. Some of these drugs (with brand names) are listed below.

- sildenafil (Viagra)
- tadalafil (Cialis)
- vardenafil (Levitra)

Nitrates and nicorandil can lower your blood pressure, and these other drugs may lower it even more. That can be dangerous.

If you worry about having sex, talk to your doctor. You might feel embarrassed talking about this. But sex is a normal part of life, and your doctor is used to dealing with sexual problems. He or she may be able to help you and your partner.

If your doctor has any doubts, he or she may suggest a stress test to see how much exercise is safe for you. For more, see [Tests for angina](#) .

#### Flying

You may wonder if it's safe for you to travel by aeroplane. Generally, if you can climb 12 stairs and walk 50 metres on flat ground without getting very breathless and without getting angina, you can fly as a passenger. <sup>[24]</sup>

### Depression

Having angina can affect how much you get out of life. You may worry so much about your condition that you feel you have to take it easy and can't live life normally. <sup>[25]</sup>

You might think of an angina attack as a sort of mini heart attack (it isn't). This might make you feel as though you have to stop doing things you enjoy. <sup>[26]</sup> And this can give you more anxiety and even depression.

If you're worried or feeling down, talk to your doctor about a self-help angina plan. This plan is based on a workbook and a relaxation tape. If you have newly diagnosed angina, the plan can help you feel better and have less anxiety and depression. You work with a nurse who helps you change the way you live and advises you about treatments. <sup>[7]</sup>

### Questions to ask your doctor

If you've been told you have angina, you may want to talk to your doctor to find out more.

Here are some questions that you might want to ask.

- Why did I get angina?
- Did I have a heart attack?
- Will I have a heart attack?
- Are there tests that can show my chances of having a heart attack?
- Will I get better?
- What's the best treatment for me?
- Will I need to have treatment for the rest of my life?
- What are the side effects of treatment? How can I cope with them?
- Will I need surgery or another type of procedure?
- Do I have to stop any activities, such as sports?
- Can I still have sex?
- Should I change what I eat? If so, how?
- Is it safe for me to drive?

If you smoke, you might want to ask your doctor:



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- Will it help if I stop smoking?
  - Where can I find help to stop?
  - What treatments are there to help me stop?
  - Is there a local support group I can join to help me stop?
- 

### Treatments:

#### Beta-blockers

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[How do they work?](#)

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[How good is the research on beta-blockers?](#)

This information is for people who have stable angina. It tells you about beta-blockers, a treatment used for stable angina. It is based on the best and most up-to-date research.

#### Do they work?

Yes. Doctors agree that beta-blockers can help you have fewer angina attacks stay active and live a normal life. They will probably be the first treatment your doctor recommends for reducing your angina attacks.

There are lots of types of beta-blockers. They all work well. Your doctor will help you choose one that suits you.

Beta-blockers seem to work about as well as other medicines for angina called [calcium channel blockers](#) and [nitrates](#) .

#### What are they?

Beta-blockers are a group of drugs used to treat heart problems. They can help you do more before you start to feel any discomfort or pain from angina.

You probably get this pain because your **coronary arteries** are narrowed. These arteries take blood to your heart. Your heart gets oxygen from your blood, so if these arteries are narrowed, your heart can't get as much oxygen as it needs.

Beta-blockers:

- Slow your heart down
- Make it beat less strongly
- Make it work less hard

## Angina, stable

- Reduce how much oxygen it uses
- Lower your [blood pressure](#) .

Here are some common beta-blockers (and their brand names):

- atenolol (Tenormin)
- bisoprolol (Cardicor)
- metoprolol (Lopresor)
- propranolol (Inderal)
- timolol (Betim).

If you still get symptoms when taking a beta-blocker, your doctor may recommend taking another treatment as well, such as a [calcium channel blocker](#) . For many people, taking two drugs works better than taking just one.

### How can they help?

There isn't much research to show whether beta-blockers work for angina. Most long-term studies have compared beta-blockers with calcium channel blockers and not with a dummy treatment (a placebo ).

Here is what these studies showed.

- Beta-blockers cut the average number of angina attacks from three a week to less than one. <sup>[29]</sup>
- People could do more exercise after they started taking these drugs. <sup>[30]</sup>
- After about three years, more than 9 in 10 people taking a beta-blocker were still alive. <sup>[31]</sup>
- People taking these drugs felt better physically and slept better. <sup>[16]</sup>

### How do they work?

Beta-blockers reduce the action of chemicals called [adrenaline](#) and [noradrenaline](#) . Your body makes these chemicals when you are scared, angry or in pain. They increase your [blood pressure](#) , and they make your heart race and beat more forcefully. The pain and anxiety you feel when you have angina cause your body to make adrenaline and noradrenaline.

## Angina, stable

Beta-blockers lessen the effects of these chemicals on your heart. So they slow your heart down and stop it working too hard. A slower, more relaxed heart uses less oxygen. And that is important if your coronary arteries are narrowed. When your heart needs less oxygen, your angina isn't as bad.

### Can they be harmful?

Beta-blockers have side effects. It's hard to say how bad these side effects are because different studies say different things.

- Some small studies showed the side effects were mild and few people stopped taking the drugs. <sup>[30]</sup> <sup>[32]</sup>
- But one large study found that slightly more than 1 in 10 people taking beta-blockers stopped because of side effects. <sup>[31]</sup>
- And one longer study found that slightly more than a quarter of people stopped taking these drugs because of side effects. <sup>[16]</sup>

Some common side effects are:

- Tiredness
- Cold hands and feet
- Bad dreams.

Some beta-blockers make erection problems worse, but this is rare. <sup>[33]</sup>

In one study, more than a quarter of people <sup>[32]</sup> got side effects, mainly tiredness.

In another study, a quarter of people got dizziness. <sup>[29]</sup> This can happen if your blood pressure drops too low. Other, less common side effects in the study were shortness of breath, headache and feeling sick. But these were mild.

We don't know if beta-blockers have more or fewer side effects than drugs called [calcium channel blockers](#) . Different studies say different things.

- One large study of people taking either a beta-blocker or a calcium channel blocker didn't find any difference in how many people stopped each treatment because of side effects. <sup>[31]</sup>
- But a longer study lasting two years found that more people stopped taking a calcium channel blocker because of side effects (about 4 in 10 people) than stopped taking a beta-blocker (fewer than 3 in 10 people). <sup>[16]</sup> The study also found that people

## Angina, stable

taking both drugs weren't any more likely to stop treatment than those taking just one drug, but the study might not have been completely reliable.

If you do get side effects, don't stop taking your medicine suddenly. See your doctor. He or she may be able to switch you to a medicine more suitable for you.

Always make certain you have a supply of your beta-blocker so that you don't run out. If you stop taking these drugs suddenly, your angina can get worse or you might even have a heart attack. If you need to stop, do it slowly with your doctor's help.<sup>[33]</sup> Your doctor will tell you how to cut down the dose.

Be sure to tell your doctor if you have [asthma](#). If you do, you shouldn't take beta-blockers because they can make your asthma worse.<sup>[33]</sup>

### How good is the research on beta-blockers?

Most doctors agree that beta-blockers work well for treating stable angina. Attacks of stable angina usually come on when you are active and then go away when you rest.

The studies we found compared beta-blockers with other drugs for angina called [calcium channel blockers](#) or with a dummy treatment (a [placebo](#)).<sup>[34] [29] [30] [31] [16] [32]</sup> But the studies weren't good enough to tell us much.

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## Calcium channel blockers

In this section

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[How can they help?](#)

[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on calcium channel blockers?](#)

This information is for people who have stable angina. It tells you about calcium channel blockers, a treatment used for stable angina. It is based on the best and most up-to-date research.

### Do they work?

Yes. Doctors agree that these drugs can help you have fewer angina attacks. They can also help you stay active and live a normal life.

There are several types of calcium channel blockers. Your doctor will help you choose the one that suits you best.

Calcium channel blockers seem to work about as well as other medicines for stable angina called [beta-blockers](#) and [nitrates](#).

### What are they?

Calcium channel blockers are drugs that are used to treat several heart problems. They work on the electrical activity in your heart, and also affect your blood vessels.

The muscle cells in your heart are driven by electrical activity. By changing this activity, calcium channel blockers can:

- Make your heart beat more slowly
- Make your heart pump less hard.

They can also:

- Relax your **arteries** and make them wider
- Lower your **blood pressure** .

Some common calcium channel blockers (and their brand names) are listed below. <sup>[35]</sup>

- diltiazem (Adizem, Dilzem, Tildiem)
- felodipine (Plendil)
- nifedipine (Adalat, Coracten SR)
- verapamil (Cordilox, Univer)

Your doctor may suggest a calcium channel blocker if you can't take a beta-blocker for your angina. He or she may also prescribe a calcium channel blocker if you are taking another medicine for angina and still getting symptoms. <sup>[36]</sup>

### How can they help?

Most of the long-term studies have compared calcium channel blockers with other drugs, and not with a dummy treatment (a **placebo** ).

Here's what the studies found.

- People could do more exercise after they started taking calcium channel blockers. <sup>[32] [29] [37]</sup>
- In one study, calcium channel blockers cut the average number of angina attacks from four a week to less than one a week. <sup>[29]</sup>

## Angina, stable

- After about three years, more than 9 in 10 people taking these drugs were still alive. [\[30\]](#)
- People taking a calcium channel blocker also felt better physically and slept better. [\[31\]](#)
- People taking calcium channel blockers also had fewer general aches and pains. [\[37\]](#)

One study showed people taking calcium channel blockers could exercise for longer than people taking medicines called [nitrates](#). [\[37\]](#)

A large study looked at giving a calcium channel blocker or a dummy treatment (a placebo) to people already taking a beta-blocker, a nitrate or both drugs. [\[38\]](#) After almost five years, people who took a calcium channel blocker were less likely to have needed coronary artery bypass surgery than people who took a dummy treatment. But both groups were just as likely to have died or had a heart attack or stroke.

### How do they work?

When calcium gets into your heart cells, it makes them want to pump. By stopping this process, calcium channel blockers can make your heart pump more gently. They slow your heart down and make it less excitable. And they lower your blood pressure.

All of these actions should protect your heart by stopping it working too hard. A slower, more relaxed heart uses less oxygen. And that's important if the vessels that carry blood to your heart (your [coronary arteries](#)) are narrowed, so your heart gets less oxygen from your blood. When your heart needs less oxygen, your angina isn't as bad.

### Can they be harmful?

Calcium channel blockers have side effects. It's hard to say how bad they are because different studies say different things.

- Some studies have found the side effects are mild and don't cause many people to stop taking their medicine. [\[32\]](#) [\[30\]](#)
- But one large study found that between 1 in 10 and 2 in 10 people taking a calcium channel blocker stopped treatment because of side effects. [\[31\]](#)
- And a study that lasted two years found that about 4 in 10 people taking these drugs stopped because of side effects. [\[16\]](#)

## Angina, stable

Some common side effects of these medicines are flushing, swelling of ankles, dizziness when standing up quickly and low blood pressure. These effects (except for ankle swelling) generally get milder as you go on with the treatment.

One study we looked at found that between 1 in 10 and 2 in 10 people taking these medicines got ankle swelling.<sup>[37]</sup> But very few (about 2 in 100) stopped treatment because of this.

You are also likely to get constipated if you take a calcium channel blocker called verapamil.<sup>[36]</sup> You may need to eat more foods that have lots of fibre (such as fruits, vegetables and whole grains) and drink more fluid (but not more drinks with caffeine in them). One study found that about 5 in 100 people stopped treatment because they were getting some kind of stomach upset.<sup>[31]</sup> But it's not clear that this was constipation.

The calcium channel blocker called verapamil can also cause a slow heartbeat. This can make you feel tired and weak.<sup>[36]</sup>

We don't know if calcium channel blockers have more or fewer side effects than other treatments for angina. Different studies say different things.

- One large study of people taking either a beta-blocker or a calcium channel blocker didn't find any difference in how many people stopped each treatment because of side effects.<sup>[31]</sup>
- But a longer study lasting two years found that more people stopped taking a calcium channel blocker because of side effects (about 4 in 10 people) than stopped taking a beta-blocker (fewer than 3 in 10 people).<sup>[16]</sup> The study also found that people taking both drugs weren't any more likely to stop treatment than those taking just one drug, but the study might not have been completely reliable.
- One study that compared calcium channel blockers with medicines called nitrates found that people taking nitrates were twice as likely to stop because of side effects.<sup>[37]</sup> Also, people taking nitrates were more likely to get headaches, whereas people taking calcium channel blockers were more likely to get ankle swelling.

If you do get side effects, don't stop taking your medicine suddenly. See your doctor. He or she may be able to switch you to a medicine more suitable for you.

If you have **heart failure**, you should not take the calcium channel blockers called verapamil and diltiazem. They may make your heart failure worse.<sup>[35]</sup>

If you are already taking a beta-blocker, you should not also take verapamil because this can bring on heart failure. Also, doctors are advised to prescribe diltiazem with caution if you are already taking beta-blockers. This is because your heartbeat might get too slow, which can make you feel tired and weak.<sup>[35]</sup> <sup>[36]</sup>

### How good is the research on calcium channel blockers?

The studies we found compared calcium channel blockers with other drugs for angina, such as [beta-blockers](#) , or with a dummy treatment (a [placebo](#) ). <sup>[34] [32] [29] [30] [31] [16]</sup>  
<sup>[37]</sup>

The studies weren't good enough to tell us much. But most doctors agree that calcium channel blockers work well for treating stable angina. Attacks of stable angina usually come on when you are active and then go away when you rest.

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## Nitrates

In this section

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[How do they work?](#)

[Can they be harmful?](#)

[How good is the research on nitrates?](#)

This information is for people who have stable angina. It tells you about nitrates, a treatment used for stable angina. It is based on the best and most up-to-date research.

### Do they work?

Yes. Doctors agree that drugs called nitrates can help you have fewer angina attacks. They can also help you do more exercise and get on with your life.

The main problem with nitrates is that your body can get used to them, which means they won't work that well after a while. <sup>[39]</sup> Doctors call this **tolerance**. But your doctor will tell you how to avoid this.

### What are they?

Nitrates are drugs that widen your blood vessels. This lets more blood flow through them. Doctors also call these drugs **vasodilators**. They work on both your [arteries](#) and your [veins](#) .

Nitrates have been used for more than 100 years to treat angina. There are different kinds. Some work for a shorter time and others work for longer.

#### Nitrates that work for a shorter time

Some nitrates start working quickly but their effects don't last long. Your doctor will give you these as tablets or a spray that you put under your tongue. The tablets melt.

Both ways, the medicine gets into your bloodstream through the lining of your mouth. It acts quickly to widen the arteries that carry blood to your heart. Those are your [coronary arteries](#) .



## Angina, stable

These nitrates start working in a few minutes, and their effects last between 20 minutes and 30 minutes. You can carry this medicine around with you, to take if you get an attack of angina. You can also use it right before you start doing something that usually brings on an attack, like going for a walk.

If you are having an attack and still have discomfort or pain after taking three doses over 15 minutes, get medical help straight away. You could be having a heart attack.

### Nitrates that work for a longer time

Other nitrates have effects that last longer. You may hear your doctor call these **longer-acting nitrates**. They come as tablets, skin patches and ointment. They're used to stop angina coming on. Your doctor might prescribe these nitrates if you can't take drugs called [beta-blockers](#). He or she might also prescribe them if you are already taking another treatment but are still getting angina. <sup>[35]</sup>

If you get a nitrate as a patch, you stick the patch on your skin. The medicine in the patch crosses your skin and gets into your bloodstream. It takes a while to start working, but the effects last longer.

If you get a nitrate as an ointment, you put it on a place on your skin that doesn't have hair, such as your stomach, chest or thigh. You use an applicator to keep the ointment off your hands.

### How to keep your nitrates working

If you take nitrates regularly to stop angina coming on, your body gets used to the drugs and they don't work as well on your angina any more. This is called tolerance.

To avoid this, doctors usually tell people to take nitrates at only certain times. For example, your doctor may tell you to take them at 8 a.m. and 3 p.m. and then no more during that day. This keeps your body free of nitrates for several hours, so it is less likely to get used to them. If you use skin patches, you take them off at night, for the same reason.

### Names of nitrates

When it comes to taking nitrates, you have several options. You can take them as tablets, a mouth spray, skin patches or an ointment.

Some common nitrates you take as tablets are:

- isosorbide dinitrate (brand name Isoket Retard)
- isosorbide mononitrate (Elantan, Imdur, Ismo)
- glyceryl trinitrate, called GTN for short

You can also get glyceryl trinitrate as a spray, patches or an ointment.

## Angina, stable

- Brand names for the spray are Coro-Nitro Pump Spray, Glytrin Spray, and Nitrolingual Pumpspray.
- Brand names for the patches are Nitro-Dur and Transiderm-Nitro
- The brand name for glyceryl trinitrate ointment is Percutol.

### How can they help?

There aren't many long-term studies on nitrates for treating angina. But doctors agree that these drugs work.

One study compared nitrates with other drugs for angina called [calcium channel blockers](#), but not with a dummy treatment (a [placebo](#)). Here's what the study showed. <sup>[37]</sup>

- Nitrates helped people have fewer angina attacks and carry on with life as usual.
- Nitrates also reduced people's aches and pains.

In the studies, nitrates worked about as well as calcium channel blockers in helping lower the number of angina attacks. <sup>[37]</sup> But they weren't as good as calcium channel blockers in helping people do more exercise.

### How do they work?

Nitrates widen your blood vessels by relaxing the muscles in their walls. They make the small blood vessels in your heart wider. This means more blood can flow through to your heart, so the effect of your blocked coronary artery isn't so bad. More blood means more oxygen. And that means less discomfort or pain.

### Can they be harmful?

Nitrates have side effects. But they are mild compared with the side effects of some other drugs used to treat heart problems.

These are some of the side effects they can cause. <sup>[39]</sup>

- Headaches. Nitrates widen the blood vessels in your brain. This can cause a throbbing headache that starts soon after you take the drug. But you should stop getting headaches after you've been taking it for a few days.
- Dizziness and fainting. Nitrates can give you [low blood pressure](#), which can make you dizzy. And if you get up too quickly after taking certain nitrates, you may get dizzy and even faint. Normally, your leg veins tighten up as you stand up to stop blood pooling in your legs. Nitrates stop this happening, so your blood pressure drops when you stand up. That means there's not enough blood going to your head.

## Angina, stable

- Red or flushed skin. Nitrates widen the small blood vessels in your skin. And this can make it turn red and feel warm, like when you blush.

Most nitrates work for only a short time. That means the side effects wear off quickly.

Here's what the study we looked at showed. <sup>[37]</sup>

- More than half the people taking a nitrate got side effects.
- Only 7 in 100 got serious side effects.
- But 18 in 100 people stopped taking the medicine because of side effects.
- The most common side effect was headache (13 in 100 people got this).

In one study, the number of people who stopped taking nitrates because of side effects was twice as high as the number of people who stopped taking calcium channel blockers.

If you do get side effects, don't stop taking your medicine suddenly. See your doctor first. He or she may be able to switch you to a medicine more suitable for you.

### How good is the research on nitrates?

Most doctors agree that nitrates work for treating stable angina. Attacks of stable angina usually come on when you are active and then go away when you rest.

We found only one small study that compared a nitrate with another treatment called a [calcium channel blocker](#). <sup>[37]</sup> The study included 196 people with stable angina. It found that both treatments worked the same in terms of how many angina attacks people had and how they felt about their condition (their quality of life). But people who took the calcium channel blocker could exercise slightly longer before they got chest pains than those who took a nitrate.

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## Nicorandil

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[How good is the research on nicorandil?](#)

This information is for people who have stable angina. It tells you about nicorandil, a treatment used for stable angina. It is based on the best and most up-to-date research.

### Does it work?

Yes. The drug nicorandil is likely to help you have fewer angina attacks, do more exercise and get on with your life. This is especially true if you take nicorandil with other medicines to treat your angina. <sup>[40]</sup>

### What is it?

Nicorandil belongs to a group of drugs called **potassium channel openers**. These drugs widen your blood vessels. This lets more blood flow through them. Doctors call such drugs **vasodilators**.

Potassium channel openers work on both your **arteries** and your **veins**. They work like another group of drugs called [nitrates](#). But your body can get used to nitrates, so after a while they don't work as well. Doctors call this **tolerance**. You don't get this problem with potassium channel openers.

Nicorandil probably won't be the first treatment your doctor gives you. You might be offered this drug if you can't take other drugs called [beta-blockers](#). And if you're already taking another medicine for your angina but are still getting symptoms, you might be offered nicorandil to take as well. <sup>[41]</sup>

The brand name for nicorandil is Ikorel.

### How can it help?

Doctors agree that nicorandil can help you have fewer symptoms, do more exercise, and get on with your life. <sup>[42]</sup>

### How does it work?

Nicorandil widens your blood vessels. It does this by relaxing the muscles in their walls. The drug widens any **coronary arteries** that are narrowed. This lets more blood pass through to your heart. More blood means more oxygen. And that means less discomfort and pain.

### Can it be harmful?

We didn't find much research on side effects, so we don't know how often people get them or how bad they are. But we do know that side effects can include headaches, flushing and dizziness. You may also get an upset stomach. <sup>[41]</sup> These shouldn't bother you as much if you start taking the drug at a low dose.

When you start taking nicorandil, you shouldn't drive or operate machinery. You need to find out first how the drug affects you.

### How good is the research on nicorandil?

There hasn't been much research on nicorandil. But doctors generally agree that this type of drug works for treating stable angina.

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## Aspirin

In this section

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This information is for people who have stable angina. It tells you about aspirin, a treatment used for stable angina.

### Does it work?

Yes. If you have angina, you may have an increased risk of a heart attack. Aspirin can help cut this risk.

### What is it?

Most of us think of aspirin as a painkiller. But it's also an antiplatelet drug. Platelets are sticky particles that help your blood clot when you're injured. But sometimes, platelets also form clots in the vessels that supply blood to your heart. This can cause a heart attack. Aspirin stops platelets from sticking together, making your blood less likely to clot.

If you have angina, your doctor will probably tell you to take a small dose of aspirin every day. The dose will be about 75 milligrams (mg).

### How can it help?

Taking aspirin can lower your risk of having a heart attack. <sup>[43]</sup> <sup>[44]</sup>

### How does it work?

If you have angina, it probably means that the arteries that go to your heart (your **coronary arteries**) are narrowed. Aspirin works by stopping your blood clotting in these arteries, so they won't get even more blocked.

### Can it be harmful?

The biggest worry about taking aspirin for a long time is that it can cause dangerous bleeding, especially in your brain or stomach. However, there's only a small chance you'll have bleeding. Experts agree that the risk is worth taking because the benefits of treatment far outweigh the possible harmful effects. <sup>[45]</sup>

You may get heartburn if you take aspirin. If you do, tell your doctor. He or she might suggest that you take coated aspirin instead or take an antacid to treat the heartburn.

## Angina, stable

Tell your doctor if you are **allergic** to aspirin. If you are, you may be given another drug called clopidogrel (brand name Plavix). It works just as well as aspirin. But you'll need a prescription to get it.

Clopidogrel may not work as well with heartburn drugs called proton pump inhibitors (PPIs). These drugs reduce the amount of acid produced in the stomach and are used to protect against acid reflux ( [GORD](#) ) and stomach ulcers. Brand names include Nexium, Losec, and Proteum. But research shows these drugs may stop the body from breaking down clopidogrel properly, so it may not work as well. Doctors have been advised to avoid using PPIs along with clopidogrel. <sup>[46]</sup>

The Food and Drug Administration (FDA), the body that checks the safety of drugs in the United States, says that taking ibuprofen with low doses of aspirin can make the aspirin less effective. <sup>[47]</sup> This means that if you take ibuprofen regularly together with aspirin, the aspirin may not reduce the risk of a stroke or heart attack so well.

Ibuprofen is a type of painkiller called a non-steroidal anti-inflammatory drug ( NSAID ). NSAIDs are often used to treat conditions where there is pain and inflammation, such as arthritis. The FDA says that other NSAIDs may also stop aspirin working properly.

At the moment, doctors in the UK have not been given any guidance about using these two drugs together. US guidance suggests taking your aspirin at least half an hour before taking ibuprofen. See your doctor if you have any questions.

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## Coronary angioplasty

In this section

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This information is for people who have stable angina. It tells you about coronary angioplasty, a treatment used for stable angina.

### Does it work?

We haven't looked at the research on this treatment in as much detail as we've looked at the research on most of the treatments we cover. (To read more, see Our Method.) But we've included some information because you may have heard of it or be interested in it.

### What is it?

Coronary angioplasty widens your arteries to make it easier for blood to flow to your heart. This should improve your angina symptoms. However, it may not help more than drug treatments and it does have risks.

Doctors may suggest angioplasty if:

## Angina, stable

- You still get chest pain even though you are taking tablets for angina
- The x-ray shows a narrow part in the arteries in your heart and your doctor thinks it's causing your chest pain
- Your doctor thinks the narrowing can be opened up by angioplasty (short, straight narrow parts are easiest to open up).

During the operation, a doctor uses a tiny deflated balloon that is attached to the end of a thin tube. This tube is inserted into your body, usually near your groin. It is then fed through your blood vessels until it reaches the part of your artery that is blocked. The doctor then inflates and deflates the balloon several times, widening the artery and getting blood flowing through it again. You can usually go home the same day.

More than 9 in 10 people who have an angioplasty also have a stent put in. A stent is a small tube inserted into the artery to keep it open. It acts like a kind of scaffold, to stop the artery closing up again.

Some stents are 'bare metal', and some slowly release a drug (drug-eluting stents). It is not clear which type of stent is better in the long term. <sup>[48]</sup> <sup>[49]</sup> <sup>[50]</sup>

We've prepared some extra information for people considering having angioplasty. For more information, see [Coronary angioplasty](#).

### How can it help?

For 9 in 10 people, angioplasty will widen the narrowing in their artery. <sup>[50]</sup>

Having angioplasty can: <sup>[51]</sup> <sup>[52]</sup> <sup>[53]</sup>

- Reduce the chest pain you get
- Mean you don't need to take as many drugs for your angina
- Stop you feeling as breathless
- Help you walk further and go upstairs more easily.

However, it's unclear whether angioplasty is much better than drug treatments in improving people's angina symptoms. <sup>[54]</sup> It's also unclear whether angioplasty works better than drugs in reducing the risk of heart attacks, or helping people live longer. It doesn't seem to work as well in these respects as a [coronary artery bypass graft](#). <sup>[55]</sup> <sup>[56]</sup> <sup>[57]</sup> <sup>[58]</sup> <sup>[59]</sup>

### How does it work?

Coronary angioplasty widens your coronary artery, so your heart gets more blood and oxygen. This should improve your angina symptoms.

### Can it be harmful?

As with all procedures, angioplasty has risks.

#### Small risks

- You may have pain in your chest during the operation. You might also feel discomfort where the tube is inserted. Painkillers will help.
- Doctors give you drugs to stop your blood clotting after you have this operation. These drugs might make you bleed at the place where the tube has been inserted.

#### Major risks

- Sometimes doctors have to give up on doing the operation because they can't get the tube into the coronary artery. But this rarely happens.
- In a few people, the coronary artery that's been reopened quickly closes off again. <sup>[60]</sup> If this happens, your doctor might suggest that you need emergency open heart surgery. In this operation, doctors take a vein from another part of your body, usually your leg, and stitch it around the blockage to get blood flowing to your heart again. This is called a [coronary artery bypass graft](#).

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## Coronary artery bypass graft

In this section

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This information is for people who have stable angina. It tells you about coronary artery bypass graft, a treatment used for stable angina.

### Does it work?

We haven't looked at the research on this treatment in as much detail as we've looked at the research on most of the treatments we cover. (To read more, see Our Method.) But we've included some information because you may have heard of it or be interested in it.

### What is it?

Coronary artery bypass graft is an operation to improve the blood flow to your heart, which should help your angina symptoms. However, this is a big operation with serious risks.



## Angina, stable

Most people with angina are treated with drugs. But your doctor may suggest bypass surgery if: <sup>[6]</sup>

- You still get chest pain even though you are taking tablets for angina
- An **x-ray** shows narrowing in the arteries in your heart. Your doctor is more likely to suggest an operation if all three of your heart's arteries have narrowed, or if the narrowing involves your heart's main artery (the aorta)
- The left side of your heart isn't working as well as it should
- You get chest pain whenever you do anything that needs physical effort
- You have a narrowed artery that can't be widened by an operation called [coronary angioplasty](#) .

In a bypass operation, a surgeon takes parts of healthy blood vessels from another part of your body (such as your leg) and uses them to take over from the narrowed arteries in your heart. Coronary artery bypass graft is sometimes called CABG for short (pronounced 'cabbage').

Bypass surgery usually takes between three and six hours. You'll be given a **general anaesthetic** , so you'll be asleep during the operation. Afterwards, you'll recover in intensive care. You'll usually be walking after two days and home within 10 days.

But a coronary artery bypass is a serious operation and it may take you months to recover fully.

We've prepared some extra information for people considering having a coronary artery bypass. To find out more, read [Coronary artery bypass](#).

### How can it help?

If you have angina, having a coronary artery bypass can: <sup>[61] [14] [62] [63] [64] [65]</sup>

- Reduce your chest pain and stop you feeling so breathless. About 9 in 10 people have no angina after their operation. Half the people who have bypass surgery still have no symptoms of angina five years later.
- Reduce the amount of tablets you need to take for angina. You may even be able to stop taking them altogether. You may need to keep taking tablets for [high blood pressure](#) and [high cholesterol](#) . Taking [aspirin](#) will reduce the risk of your new, healthy blood vessels clogging up.
- Generally make you feel better. You may be more able to go out and see friends or have hobbies.

### How does it work?

If arteries in your heart have become narrowed, your heart doesn't get enough oxygen. A bypass operation reroutes the blood so your heart gets more blood and oxygen. This should improve your angina symptoms.

### Can it be harmful?

All operations have risks, and your surgeon will talk them through with you before you have a coronary artery bypass.

Anaesthetics can have side effects. You may have an allergic reaction to the anaesthetic or get breathing or heart problems. This is serious, but also very rare. If you have any allergies, you must tell your doctor.

In the first few days after surgery, you may have these problems: <sup>[61]</sup>

- Pain in your chest
- Pain where the surgeon removed a blood vessel
- An irregular heartbeat
- A heart attack
- A stroke.

You may need help with breathing, or a **blood transfusion**.

In the weeks and months after surgery, you may have these problems: <sup>[61] [66] [67] [68]</sup>

- Infection. There's a small chance that the wound in your chest will become infected and that you'll need to stay in hospital for a few extra days while you are given antibiotics.
- Problems with your memory. Between 1 and 5 out of 100 people have problems with their memory.
- A heart attack. There's a small chance you could have a heart attack. About 7 in 100 people who have this type of surgery have a heart attack within 30 days.
- A stroke. There's a small risk that you could have a stroke.
- Kidney problems. Bypass surgery can stop your kidneys working properly. They usually recover, but in rare cases you may need dialysis (where a machine does the work of your kidneys and gets rid of waste products in your blood).

## Angina, stable

- Dying from your operation. There's a small chance that you could die. About 3 in 100 people die within 30 days of having bypass surgery.
- 

## Ivabradine

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

This information is for people who have stable angina. It tells you about ivabradine, a treatment used for stable angina.

### Does it work?

We haven't looked at the research on ivabradine in as much detail as we've looked at the research on most of the treatments we cover. (To read more, see Our Method.) But we've included some information because you may have heard of this treatment or be interested in it.

### What is it?

Ivabradine (brand name Procoralan) slows your heart rate down so your heart does not have to work so hard. It may be given to you on its own, or with other medicines.

### How can it help?

Ivabradine may help increase the amount of time you can exercise for, and reduce how many angina attacks you have. <sup>[69]</sup>

### How does it work?

Ivabradine works by blocking chemicals in your blood that control your heart rate. This slows your heart rate down, reducing the amount of work your heart has to do.

### Can it be harmful?

Ivabradine has some common side effects, such as: <sup>[70]</sup>

- A slow heart beat
- Headaches
- Dizziness
- Visual disturbances (seeing bright lights or blurred vision).

## Angina, stable

It also has some less common side effects such as:

- Nausea
  - Constipation
  - Diarrhoea
  - A fast heart beat (palpitations)
  - Muscle cramps
  - Shortness of breath
  - Feeling like the room is spinning (vertigo).
- 

## Ranolazine

In this section

[Does it work?](#)

[What is it?](#)

[How can it help?](#)

[How does it work?](#)

[Can it be harmful?](#)

This information is for people who have stable angina. It tells you about ranolazine, a treatment used for stable angina.

### Does it work?

We haven't looked at the research on ranolazine in as much detail as we've looked at the research on most of the treatments we cover. (To read more, see Our Method.) But we've included some information because you may have heard of this treatment or be interested in it.

### What is it?

Ranolazine (brand name Ranexa) is a medicine that improves your heart's use of oxygen.

It is usually given as an additional treatment when someone's angina is not controlled very well by other medicines. You may also be prescribed ranolazine on its own if you can't take other medicines for some reason. Your doctor will let you know which medicines are safe for you to take.

### How can it help?

If you take ranolazine in addition to other angina medicine, it may increase the amount of time you can be active for without angina symptoms, and reduce the number of angina

## Angina, stable

attacks you have. <sup>[69]</sup> We don't know how well ranolazine works when it's taken on its own.

### How does it work?

Ranolazine is a medicine that helps your heart use oxygen more effectively. This should improve your angina symptoms.

### Can it be harmful?

Ranolazine has some common side effects, such as: <sup>[70]</sup>

- Constipation
- Nausea
- Vomiting
- Dizziness
- Headache
- Loss of strength.

However, studies have found that the addition of ranolazine to other angina medicines does not appear to increase the risk of side effects. <sup>[69]</sup>

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### Further informations:

#### How your heart moves blood around your body

Two main types of blood vessels work together to carry blood through your body: arteries and veins.

**Arteries** are vessels that carry blood away from your heart. Arteries carry blood to the cells in your body after the blood has picked up oxygen from your lungs.

**Veins** carry blood back from your cells to your heart. From here, the blood is pumped to your lungs to pick up more oxygen.

#### What happens when your heart beats?

Every time your heart beats, three things happen.

## Angina, stable

- Your heart relaxes so blood can flow into it.
- The two upper chambers of your heart contract, squeezing blood into the two lower chambers.
- The two lower chambers contract and pump blood out. The right chamber pumps blood to your lungs. The left one pumps blood to the rest of your body.

Your heart beats about 60 to 80 times a minute. But it can beat as many as 150 times a minute if you're exercising hard and your body needs more oxygen and food.

To read more, see [How blood moves through your heart](#) and [How your heart moves blood around your body](#).

### How blood moves through your heart

Once your blood has delivered oxygen and food to your cells, it returns to the upper chamber on the right side of your heart.

From there, it moves into the lower chamber on the right. Next, it travels to your lungs through the **pulmonary artery**. That artery is a short, wide blood vessel that stretches between your heart and your lungs. There, it picks up oxygen.

Once blood has picked up oxygen, it returns to the left side of your heart through your **pulmonary veins**. These veins are four large blood vessels that bring blood back from your lungs to your heart.

Blood enters the upper chamber on the left side. Then it moves into the lower chamber on the left. It's then pumped through the main artery of your body (called the aorta) to all parts of your body.

### Other types of angina

Stable angina is the most common type of angina. But there are two other types.<sup>[3]</sup> Here's a brief description of each.

#### Unstable angina

Unstable angina is chest discomfort or pain that you get without much activity or that happens a lot. It can also last longer, sometimes as long as half an hour, before it goes away.

Stable angina can lead to unstable angina. But you can get unstable angina even if you haven't ever had stable angina.

## Angina, stable

Unlike stable angina, unstable angina does not follow a pattern. You can get it while you are sitting quietly or lying in bed at night and your heart isn't working harder than usual. Also, unstable angina usually doesn't go away when you take your angina medicine. And you may find you are having more attacks or having worse pain than usual.

If you think you have unstable angina, call for emergency medical help. It may be a sign that you will have a heart attack soon.

Unstable angina is usually caused by a larger blockage in one of your coronary arteries. This happens when a fatty clump (called a plaque) inside your artery breaks open and a blood clot forms on top of it.

The blood clot can partly go away but come back later. Each time a clot blocks the artery, you can get chest pain. You might also get a clot that stays and narrows the artery so much that you have angina even when you are resting.

To learn more, see [Angina, unstable](#).

### Variant (Prinzmetal's) angina

Variant angina isn't very common. You may hear doctors call this type Prinzmetal's angina. It's most likely to happen while you are resting or during the night. You may get bad pain or discomfort. But it goes away if you take angina medicine.

Variant angina is caused by a spasm in one of your coronary arteries. The spasm makes the artery get narrower. This means it can't carry as much blood to your heart.

You can get this type of angina even if you don't have narrowing of your arteries from fatty clumps. These attacks can be brought on by cold weather, stress, smoking, and certain medicines. <sup>[4]</sup>

## Other causes of angina

Angina is the discomfort or pain you feel, most likely in your chest, when your heart isn't getting enough oxygen. It's typically caused by narrowing of the arteries that carry blood to your heart. Doctors call this **coronary artery disease**.

But angina can be caused by other conditions that also stop your heart getting enough oxygen. Here are some of those other conditions.

- You have problems with the valves in your heart.
- You have high blood pressure that hasn't been treated.
- You have a condition that doesn't have anything to do with heart problems but that makes your heart work harder. For example, if you have anaemia, your blood doesn't carry enough oxygen. And if your thyroid gland is too active, your heart

## Angina, stable

beats faster than normal. In both cases, your heart has to work harder, so it needs more oxygen. But it may not get as much as it needs to keep up.

### What you can do to help yourself

If you get angina, your doctor will talk to you about things you can do to make your health better and to stop your angina and heart disease getting worse.

Here's a list of some things your doctor might suggest. <sup>[6]</sup> <sup>[3]</sup>

- Stop smoking. If you smoke, now is the time to stop. The more you smoke, the greater your risk of dying from heart disease. For more about stopping, see [Smoking](#).
- Lose weight. If you are obese or overweight, try to lose weight. It may help to see a dietitian. Your doctor can also tell you about lifestyle changes, diets, and treatments that might help. For more, see [Obesity](#).
- Eat a healthy diet. You should eat at least five servings of fruits and vegetables every day, eat at least one serving of oily fish (such as salmon) every week, and cut back on how much fat and how many sugary foods you eat.
- Take reasonable exercise. Talk to your doctor about what kind of exercise and how much is safe for you.
- Limit how much alcohol you drink. Men shouldn't drink any more than three to four units a day. Women shouldn't drink any more than two to three units a day. One unit is half a pint of ordinary-strength lager or a single shot (25 millilitres) of a spirit, such as whisky or gin. A small glass (125 millilitres) of wine is about one and a half units. But bear in mind that different wines and beers have different strengths of alcohol.
- Learn how to manage stress. Exercising regularly and getting enough sleep can help. You might also consider taking a class in meditation or allowing yourself 15 to 20 minutes each day to sit quietly, breathe deeply, and imagine a peaceful scene. When you're feeling angry, try counting to 10 to give yourself time to calm down. You might ask your doctor for other stress-management suggestions.
- Ask about a self-help angina plan. This is a plan based on a workbook and a relaxation tape. If you just found out that you have angina, this plan can help you feel better and have less anxiety and depression. A nurse helps you change the way you live and advises you about medicine. Ask your doctor about this kind of plan. <sup>[7]</sup>



### Other causes of chest pain

It can be hard for your doctor to work out if the discomfort or pain you're feeling in your chest really is angina. To help tell what's causing your symptoms, your doctor will ask you some questions, will examine you, and may suggest some tests.

Here's a list of other causes of chest discomfort or pain that can get confused with angina:

[6] [2]

- Food coming back up from your stomach towards your throat (doctors call this [acid reflux](#) )
- An [ulcer in your stomach](#)
- [Inflammation](#) of your [gallbladder](#)
- Inflammation or an injury in your chest, ribs, or shoulder
- Inflammation of the lining of your lungs (called pleurisy), or another disease of your lungs
- [Anxiety](#)
- A [panic attack](#) .

### Living with angina

If you get angina, relieving your chest discomfort or pain is only part of the treatment picture. The other part is treating your heart disease to stop your angina getting worse and to lower your risk of having a heart attack.

If you get angina you probably have **coronary artery disease**. With this disease, the arteries that carry blood to your heart (your [coronary arteries](#) ) are narrowed by clumps of fatty tissue. A bad blockage can lead to worse angina and even a heart attack. But treatments can lower your chances of these things happening.

Here are some steps your doctor may suggest.

- Your doctor will probably tell you to take an aspirin every day. If you take this drug, your blood is less likely to clot in your narrowed arteries. That helps stop you having a heart attack. For more, see [Aspirin](#) .
- Your doctor will probably also suggest that you take drugs called **statins**. These drugs help lower your levels of [cholesterol](#) and help stop you having a heart attack.

## Angina, stable

- If your angina is bad, you may need surgery to get more blood going to your heart. Your doctor may suggest [coronary angioplasty](#) or a [coronary artery bypass](#) .
- Your doctor will also suggest changing the way you live. These changes may include taking regular light exercise, improving your diet, learning ways to better manage stress, and losing weight if you need to. For more, see [What you can do to help yourself](#) .

### Tests for angina

The most common tests for angina are listed below. You'll probably be able to have an electrocardiogram (ECG for short) in your doctor's surgery. Other tests typically are done at hospital.

#### Electrocardiogram (ECG)

An ECG is one of the most important tests doctors can use to find out if your chest discomfort or pain is coming from a lack of oxygen to your heart.

When you have this test, small sensors (called electrodes) are put on your chest. They pick up the electrical activity in your heart.

Wires from the sensors go to a machine. The machine shows the electrical activity as a line on a graph.

ECGs don't hurt and don't affect your heart.

From this test, your doctor can tell:

- If you've had a heart attack before
- How fast your heart is beating
- If your heart is beating in a regular pattern
- If your heart chambers are a normal size
- How thick the walls of your heart are.

The ECG is often normal in people with angina. But it can show changes during or just before you have an attack of angina. This is the idea behind a stress test (see below).

#### Stress test

Stress tests make your heart work harder. This allows them to uncover problems that don't show up while you're resting.

## Angina, stable

A stress test can help your doctor tell if you have narrowing of the arteries that carry blood to your heart (your coronary arteries). Doctors call this condition **coronary artery disease**. And the test may show how bad the narrowing is. This can help your doctor decide if you should be offered more tests and maybe surgery.

There are two kinds of stress tests, described below. Your doctor will tell you which kind is best for you.

### Exercise stress test

An exercise stress test shows how much exercise you can do before your heart is put under too much strain. For this test, you walk on a treadmill. Your doctor may speed up the treadmill or make it steeper. At the same time, you have an electrocardiogram (ECG) and your blood pressure is measured.

Your doctor will look at your ECG for changes that happen when your heart isn't getting enough oxygen. You may have bad coronary artery disease if any of the following things happen during this test:

- You get chest pain
- You get short of breath
- Your ECG is abnormal
- Your blood pressure goes down.

In general, the more exercise you can do during the stress test, the more likely your doctor is to say that you have a good outlook.

But the results of your stress test may be normal even if you have coronary artery disease. <sup>[27]</sup> If your doctor suspects a problem, he or she will probably suggest a test called **coronary angiography** to say for sure.

Exercise stress testing is very safe. It is always done by well-trained doctors or other professionals. There's a slight risk that this test could bring on a heart attack or a dangerous irregular heartbeat. But this is very rare. Because of this risk, there are guidelines for doctors saying who shouldn't have a stress test. <sup>[6]</sup> <sup>[28]</sup>

Your doctor might do an echocardiogram (see below) while you have an exercise test.

### Non-exercise stress test

If you can't exercise or you have an abnormal ECG while you are resting, your doctor might suggest you have a non-exercise stress test instead. This test doesn't involve any exercise.

## Angina, stable

For this test, your doctor can give you a drug to make your heart work harder. And he or she may also use an **echocardiogram** (see below) or a special scan, called a **nuclear scan**, to see how your heart is working. (During a nuclear scan, radioactive chemicals are injected into your blood. The chemicals stick to red blood cells and travel through your bloodstream and heart. Doctors can then use a special scanner see images of your heart and blood vessels.)

### Echocardiogram

An echocardiogram uses sound waves to tell doctors how well your heart is working. It's a type of ultrasound test.

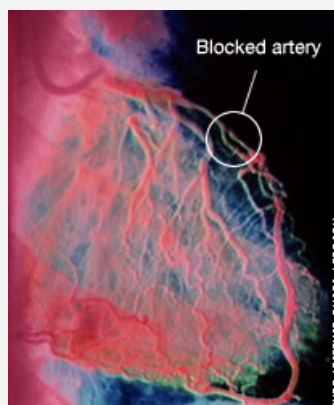
For this test, an instrument that sends and picks up sound signals is put on your chest. The sounds (echoes) it picks up show up on a screen as a picture.

This test is safe and it doesn't hurt.

From this test, your doctor can tell:

- How well your heart chambers fill with blood and pump it to the rest of your body
- If your heart muscle has any damage
- If your heart is a normal size
- If your heart valves are working properly.

### Coronary angiography



A coronary angiography can show blocked arteries.

Coronary angiography is a type of x-ray that shows your coronary arteries.

This test is done in an x-ray laboratory. You may hear doctors call it the **cath lab**. Before the test, you may be given medicine to make you sleepy.

## Angina, stable

When you have angiography, doctors put a thin tube (called a catheter) through an artery in your arm or thigh and into your heart. Then they inject dye through the tube into your coronary arteries. When they take the x-ray, the dye shows up.

From this test, your doctor can tell how badly your coronary arteries are narrowed. If it shows that your arteries are very narrow, your doctor may suggest you have a procedure to widen them. This is called [coronary angioplasty](#) .

### Glossary:

#### **atherosclerosis**

Atherosclerosis is also called 'hardening of the arteries'. It happens when fatty material sticks to the inner wall of your arteries. Over time, cholesterol, fats and other things in your blood stick to the same area and the artery wall becomes thick and narrow, making it progressively more difficult for blood to flow through the affected vessels.

#### **coronary arteries**

Coronary arteries are the vessels that supply blood to the heart muscle. If yours are blocked, you may have a pain in your chest (known as angina) or a heart attack because parts of the heart are not getting enough blood and oxygen.

#### **arteries**

Arteries are the blood vessels that take blood that is rich in oxygen and food away from your heart. The arteries carry this blood to all the tissues in your body.

#### **high blood pressure**

Your blood pressure is considered to be high when it is above the accepted normal range. The usual limit for normal blood pressure is 140/90. If either the first (systolic) number is above 140 or the lower (diastolic) number is above 90, a person is considered to have high blood pressure. Doctors sometimes call high blood pressure 'hypertension'.

#### **anaemia**

Anaemia is when you have too few red blood cells. Anaemia can make you get tired and breathless easily. It can also make you look pale. Anaemia can be caused by a number of different things, including problems with your diet, blood loss and some diseases.

#### **thyroid gland**

Your thyroid gland is a small organ that sits in your neck, just in front of your windpipe. It sends out a hormone called thyroxine. This acts on receptors within cells. By acting on the receptors it gives the cells a message to speed up their metabolism and work harder.

#### **high cholesterol**

If you've been told that you have high cholesterol it usually means that your total cholesterol level is 5mmol/l or higher. But doctors also look at the amount of good (HDL) and bad (LDL) cholesterol you have in your blood. Having high levels of bad cholesterol can make it more likely that you'll get certain diseases in your heart and arteries.

#### **obesity**

If your body stores more energy than you need, this can make you overweight. The excess energy is stored in your fat cells. If your weight goes above a certain level, doctors call this obesity. Obesity is considered a medical condition. The excess weight can be a strain on your bones and joints. And if you are obese, you're more likely to get other diseases. Doctors have developed a scale for telling how much excess weight you have. This measure, called the body mass index (BMI), depends on your height.

#### **diabetes**

Diabetes is a condition that causes too much sugar (glucose) to circulate in the blood. It happens when the body stops making a hormone called insulin (type 1 diabetes) or when insulin stops working (type 2 diabetes).

#### **acid reflux**

Acid reflux happens when acid from your stomach flows into the tube leading from your throat to your stomach (your oesophagus) or up into your throat. Acid reflux can cause heartburn.

#### **stomach ulcer**

A stomach ulcer is a break in the surface that covers the inside of your stomach.

#### **inflammation**

Inflammation is when your skin or some other part of your body becomes red, swollen, hot, and sore. Inflammation happens because your body is trying to protect you from germs, from something that's in your body and could harm you (like a splinter) or from things that cause allergies (these things are called allergens). Inflammation is one of the ways in which your body heals an infection or an injury.

# Angina, stable

## **gall bladder**

The gall bladder is a small organ below the liver on the right side of the abdomen. Its job is to store bile, a chemical made in the liver that helps to break down food in the intestines. The chemicals in the gall bladder can, under certain circumstances, become solid and form small stones. If a stone gets stuck in the tubes that empty the gall bladder, there can be a backup of fluid, causing the gall bladder to swell and possibly become infected. This condition is called gall bladder disease.

## **heart failure**

When the heart loses its ability to push enough blood through the blood vessels, it is called heart failure.

## **cholesterol**

Cholesterol is a fat-like substance made by your liver or absorbed from food. It is used by your body to make bile acids (which help your intestines absorb nutrients) and steroid hormones (like testosterone or oestrogen). Cholesterol is also an important part of cell membranes, which are the structures that surround cells. 'Good cholesterol' is called HDL; 'bad cholesterol' is LDL.

## **heart disease**

You get heart disease when your heart isn't able to pump blood as well as it should. This can happen for a variety of reasons.

## **blood pressure**

Blood pressure is the amount of force that's exerted by your blood on to your blood vessels. You can think of it like the water pressure in your home: the more pressure you have, the faster and more forcefully the water flows out of the shower. Blood pressure is measured in millimetres of mercury (written as mm Hg). When your blood pressure is taken, the measurement is given as two numbers, for example 120/80 mm Hg. The first, higher, number is called the systolic pressure, and the second, lower, number is the diastolic pressure. The systolic number is the highest pressure that occurs while your heart is pushing blood into your arteries. The diastolic number is the lowest pressure that happens when your heart is relaxing and is not pushing your blood.

## **pulse rate**

Your pulse rate is the number of times that your heart beats in one minute. A normal rate is between 60 and 100 beats per minute, but the heart can speed up under certain circumstances, such as when you exert yourself or when you have an infection.

## **X-ray**

X-rays are pictures taken of the inside of your body. They are made by passing small amounts of radiation through your body and then onto film.

## **heart attack**

Doctors call a heart attack an acute myocardial infarction (or acute MI). This is the name for the damage that occurs to the heart muscle if it isn't getting enough blood and oxygen because a branch of the coronary arteries is blocked. During a heart attack, you may have pain or heaviness over your chest, and pain, numbness or tingling in your jaw and left arm.

## **red blood cells**

Red blood cells are the part of your blood that makes it red. Their main job is to carry oxygen from your heart and lungs to the tissues of your body. Once these cells unload oxygen, they pick up carbon dioxide. They take carbon dioxide back to your lungs so it can be breathed out of your body.

## **ultrasound**

Ultrasound is a tool doctors use to create images of the inside of your body. An ultrasound machine sends out high-frequency sound waves, which are directed at an area of your body. The waves reflect off parts of your body to create a picture. Ultrasound is often used to see a developing baby inside a woman's womb.

## **placebo**

A placebo is a 'pretend' or dummy treatment that contains no active substances. A placebo is often given to half the people taking part in medical research trials, for comparison with the 'real' treatment. It is made to look and taste identical to the drug treatment being tested, so that people in the studies do not know if they are getting the placebo or the 'real' treatment. Researchers often talk about the 'placebo effect'. This is where patients feel better after having a placebo treatment because they expect to feel better. Tests may indicate that they actually are better. In the same way, people can also get side effects after having a placebo treatment. Drug treatments can also have a 'placebo effect'. This is why, to get a true picture of how well a drug works, it is important to compare it against a placebo treatment.

## **adrenaline**

Adrenaline is a chemical that makes your heart race and makes you feel alert. It is sometimes called the 'fight-or-flight' hormone.

## **noradrenaline**

Noradrenaline is a neurotransmitter, which is a chemical that helps to send information between nerve cells. It is similar to adrenaline. Your body produces adrenaline when you're in stressful situations, which increases your blood pressure and heart rate.

## **asthma**

Asthma is a disease of the lungs. It makes you wheeze, cough and feel short of breath. Asthma attacks are caused by inflammation and narrowing of your airways, which makes it hard for air to pass in and out of your lungs.

## **veins**

# Angina, stable

Veins are blood vessels that carry blood back to your heart after your blood has delivered oxygen and food to the tissues.

## low blood pressure

If your blood pressure is about 100/60 or less, your doctor may say that you have low blood pressure. Low blood pressure is usually not a problem unless it becomes too low to push blood to your brain and the rest of the body. If you have low blood pressure, you may sometimes feel dizzy when you stand up.

## allergy

If you have an allergy to something (such as pollen or a medicine), your body always overreacts to it. The reaction happens because your immune system (your body's system for fighting infection) is too sensitive to it.

## NSAIDs

NSAID stands for nonsteroidal anti-inflammatory drug. NSAIDs help with pain, inflammation and fever. They are called 'nonsteroidal' because they don't contain any steroids. Aspirin and ibuprofen are both NSAIDs.

## general anaesthetic

You may have a type of medicine called a general anaesthetic when you have surgery. It is given to make you unconscious so you don't feel pain when you have surgery.

## blood transfusion

If you've lost too much blood from your body, you may need a blood transfusion to replace it. People with diseases of their blood, like sickle cell anaemia, sometimes need blood transfusions to replace blood that doesn't work properly.

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