

# Angina

Angina is caused by narrowing of the coronary arteries. Usual treatments include medication to lower your cholesterol level, and low-dose aspirin to help prevent a heart attack. Also, medication can ease and prevent angina pains. In some cases, angioplasty or surgery are options to widen, or to bypass, narrowed arteries.

## What is angina?

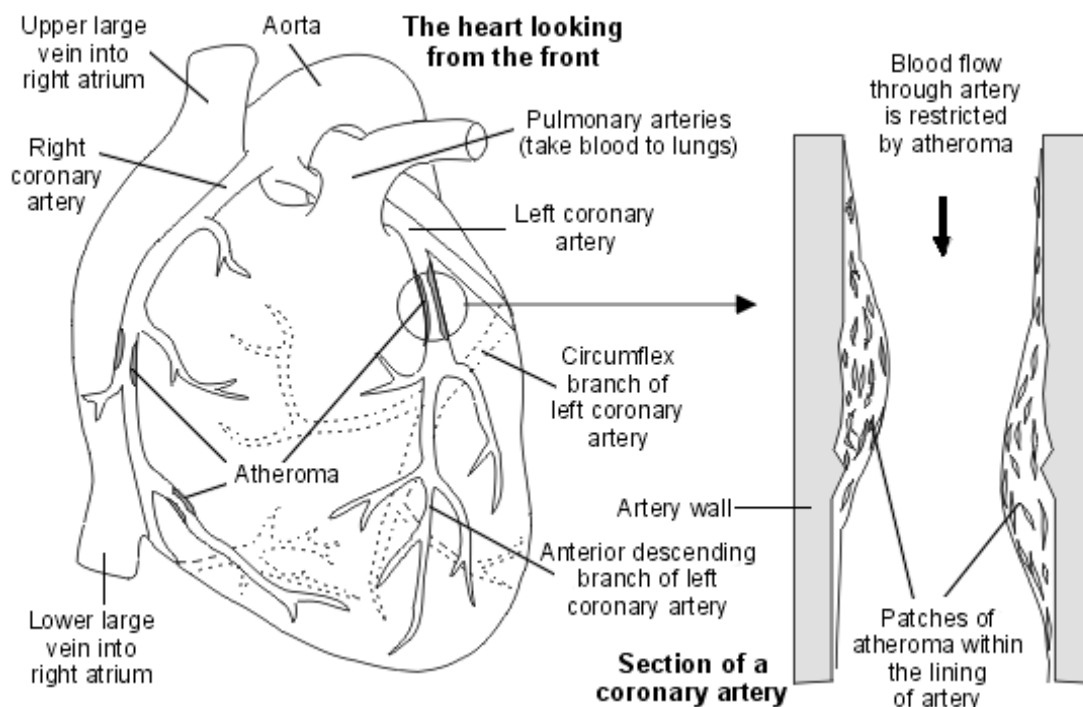
Angina is a pain that comes from the heart. It is common in people over the age of 50. Sometimes it occurs in younger people. It is more common in men than women. This leaflet is about the common type of angina which is caused by narrowing in the arteries of the heart. (Angina is sometimes caused by uncommon disorders of the heart valves or heart muscle.)

## Understanding the arteries of the heart

The heart is mainly made of special muscle. The muscle pumps blood into arteries (blood vessels) which take the blood to every part of the body.

Like any other muscle, the heart muscle needs a good blood supply. The coronary arteries take blood to the heart muscle. The coronary arteries are the first arteries to branch off the aorta. The aorta is the large artery which takes blood from the left ventricle of the heart to the body.

## What causes angina?



If you have angina, one or more of your coronary arteries is usually narrowed. This causes a reduced blood supply to a part(s) of your heart muscle. The blood supply may be enough when you are resting. However, your heart muscle needs more blood and oxygen when it works harder. For example, when you walk fast or climb stairs, your heart rate increases to deliver the extra blood. If the extra blood that your heart needs during exertion cannot get past the narrowed arteries, the heart 'complains' with pain.

The narrowing of the arteries is caused by atheroma. Atheroma is like fatty patches or 'plaques' which develop within the inside lining of arteries. (This is similar to water pipes which get 'furred up' with scale.) Plaques of atheroma may gradually form over a number of years in one or more places in the coronary arteries. In time, these can become bigger and cause enough narrowing of one or more of the arteries to cause symptoms. (The diagram shows three narrowed sections as an example. But, atheroma can develop in any section of the coronary arteries.)

## What are the symptoms of angina?

**The common symptom is a pain**, ache or discomfort which you feel across the front of the chest when you exert yourself. (For example, when you walk up a hill.) You may also, or just, feel the pain in your arms, jaw, neck or stomach. An angina pain does not usually last long. It will usually ease within 10 minutes when you rest, and often within 1-2 minutes if you take some GTN (see below).

The pain may also be triggered by other causes of a faster heart rate. For example, when you have a vivid dream or an argument. The pains also tend to develop more easily after meals, or in cold winds.

Some people have non-typical pains, for example, when bending or eating. If the symptoms are not typical then it is sometimes difficult to tell the difference between angina and other causes of chest pain such as a pulled muscle in the chest, or heartburn.

## What are the tests for angina?

Most people are diagnosed by the typical symptoms. However, some tests may be advised.

- **A blood test** may be advised to check for anaemia, thyroid problems, and a high cholesterol level as these may be linked with angina.
- **A heart tracing called an ECG (electrocardiograph)** may be advised. A routine ECG may be normal if you have angina. However, an ECG taken whilst you exercise on a treadmill ('exercise-ECG') is often abnormal. The exercise-ECG helps to assess the condition of the heart and the coronary arteries.
- **Further heart tests** are usually only necessary if the diagnosis is not clear, or if the exercise-ECG shows that the narrowing of the arteries may be severe. For example, angiography of the coronary arteries may be advised. In this test a dye is injected into the coronary arteries. The dye can be seen by special x-ray equipment. This shows up the structure of the arteries (like a road map) and can show the location and severity of any narrowing.

## What can I do to help with angina?

Certain 'risk factors' increase the risk of more atheroma forming which can make angina worse. These are discussed in more detail in another leaflet called 'Preventing Heart Disease and Stroke'. Briefly, risk factors which can be modified and may help to prevent angina from getting worse are:

- **Smoking.** If you smoke, you should make every effort to stop.
- **High blood pressure.** Make sure your blood pressure is checked at least once a year. If it is high it can be treated.
- **If you are overweight,** losing some weight is advised.
- **A high cholesterol.** This can be treated if it is high.
- **Inactivity.** You should aim to do some exercise on most days of the week for at least 30 minutes. For example, brisk walking, swimming, cycling, dancing, gardening, etc. (Occasionally, angina is due to a heart valve problem where exercise may not be so good. Ask your doctor to confirm that regular exercise is OK for you.)
- **Diet.** You should aim to eat a healthy diet. Briefly, a healthy diet means:
  - AT LEAST five portions of a *variety* of fruit and vegetables per day.
  - THE BULK OF MOST MEALS should be starch-based foods (such as cereals,

- wholegrain bread, potatoes, rice, pasta), plus fruit and vegetables.
- NOT MUCH fatty food such as fatty meats, cheeses, full-cream milk, fried food, butter, etc. Use low fat, mono-, or poly-unsaturated spreads.
- INCLUDE 2-3 portions of fish per week. At least one of which should be 'oily' (such as herring, mackerel, sardines, kippers, pilchards, salmon, or *fresh* tuna).
- If you eat meat it is best to eat lean meat, or poultry such as chicken.
- If you do fry, choose a vegetable oil such as sunflower, rapeseed or olive oil.
- Try not to add salt to food, and limit foods which are salty.
- **Alcohol.** A small amount of alcohol (1-2 units per day) may be beneficial to the heart. One unit is in about half a pint of normal strength beer, or two thirds of a small glass of wine, or one small pub measure of spirits. However, too much can be harmful. Men should drink no more than 21 units per week (and no more than 4 units in any one day). Women should drink no more than 14 units per week (and no more than 3 units in any one day).

## What are the aims of treatment if you have angina?

- To prevent angina pains, and to ease pain quickly if it occurs.
- To limit further deposits of atheroma as much as possible.
- To reduce the risk of a heart attack.

## Treatments which are advised in most cases

### Lifestyle measures to reduce 'risk factors'

Discussed above.

### GTN (Glyceryl Trinitrate)

This comes as tablets or sprays. You take a dose under your tongue 'as required' when a pain develops. GTN is absorbed quickly into the bloodstream from under the tongue. A dose works to ease the pain within a minute or so. Many people always carry their GTN spray or tablets with them. Some people take a GTN tablet or a spray before any exercise. For example, before climbing stairs. If the first dose does not work, take a second dose after 5 minutes. (If the pain persists for 15 minutes despite taking GTN, then call an ambulance.)

GTN works by 'relaxing' the blood vessels. This reduces the workload on the heart, and also helps to widen the coronary arteries and increase the flow of blood to the heart muscle.

GTN tablets 'go off' after a few weeks. So, you need a fresh supply of tablets every 8 weeks, and return any unused tablets to the pharmacist. You may prefer to use a GTN spray which has a longer shelf life than tablets. A dose of GTN may cause a headache and/or flushing for a short while. This side-effect often improves, or goes, with continued use.

### A statin medicine to lower your cholesterol level

Cholesterol is a chemical which is made in the liver from fatty foods that you eat. As mentioned, a high cholesterol level increases the risk of developing atheroma. Statin medicines lower the blood cholesterol level by blocking an enzyme (chemical) which is needed to make cholesterol in the liver. There are several brands of statin medicines.

Your cholesterol level should be lowered if it is higher than 5.0 mmol/l. However, some evidence suggests that the risk of forming further atheroma is reduced if the cholesterol level is reduced, whatever the level. Even if it is already below 5.0 mmol/l. Therefore, a statin medicine is commonly advised if you have angina. The aim is to reduce your cholesterol level by 25-30%.

### Aspirin

Aspirin reduces the 'stickiness' of platelets. Platelets are tiny particles in the blood that help the blood to clot after cuts. If lots of platelets become stuck onto a patch of atheroma inside an artery they can form a clot (thrombosis). So, taking aspirin reduces the risk of a heart attack which is caused by a blood clot forming in a coronary artery.

The usual dose of aspirin is 75 mg. This is a lot less than the dose used for pains and headaches. Side-effects are unusual with low dose aspirin. If you have a stomach or duodenal ulcer, or asthma, you may not be able to take aspirin. Another 'anti-platelet' medicine such as clopidogrel may then be advised.

## Other treatments which may be advised

### Other medication

Medicines are often prescribed to **prevent** angina pains. Regular medication can reduce the number and severity of angina pains. (You can still take GTN for 'breakthrough' angina pains.) There are many medicines which are used, but they fall into four groups.

- **Beta-blocker medicines** 'block' the action of certain hormones such as adrenaline. These hormones increase the rate and force of the heartbeat, particularly when you exert yourself. So, if you take a beta-blocker it blunts any increase in the rate and force of the heart beat, particularly when you exert yourself. Therefore less oxygen is needed by the heart, and angina pains are prevented, or occur less often.
- **Calcium channel blockers** 'relax' the coronary arteries to increase blood flow. Some of these medicines also reduce the heart rate at rest, and the rate of rise in the heart rate when you exert yourself. So, less oxygen is needed by the heart.
- **Nitrate medicines** work in a similar way to GTN.
- **Potassium channel blockers** work in a similar way to nitrates.

There are several types and brands in each group. They are all good at preventing angina pains. You may not need one if your angina pains are only infrequent. But, you are likely to be prescribed one if you have angina pains regularly.

A beta-blocker is usually the first choice, but not everyone is able to take beta-blockers (for example, if you have asthma). If the pains are not well controlled by taking one medicine, then another medicine can be added from another group. As the different groups of medicines work in different ways, combinations of these medicines complement each other. It is quite common to take a 'combination therapy' of 2 or 3 medicines to prevent angina pains.

The possible side-effects vary between the different medicines. So, if a particular medicine does not suit, you may find that a different one is fine. The aim is to find a medicine, or combination of medicines, which prevent your pains, but with minimal side-effects.

### Surgery and angioplasty

These treatments are an option if medicines fail to control the pains, or if one or more coronary arteries become very narrow.

- **Angioplasty.** In this procedure a tiny wire with a balloon at the end is put into a large artery in the groin or arm. It is then passed up to the heart and into the narrowed section of a coronary artery using special x-ray guidance. The balloon is then blown up inside the narrowed part of the artery to open it wide again. This procedure is only suitable in some cases as only arteries with short narrowed sections can be treated this way. (See separate leaflet called 'Coronary Angioplasty' for details.)
- **Surgery.** This involves an operation to bypass the narrowed sections of arteries with healthy blood vessel segments (grafts) which are taken from other parts of the body. The operation is called coronary artery bypass graft surgery (CABG). More blood can then get past into the heart muscle. Not all people with angina are suitable for this as it depends on where the narrowed arteries are.

## Some common worries about angina

- **'Straining the heart' by exertion** is a common worry. On the contrary, more exercise is usually advised. You will normally be encouraged to exercise regularly. Regular exercise helps to get the heart muscle 'fitter' and improves the blood supply to the heart muscle.

- **Sex.** Some people with angina worry that the physical effort of having sex will damage the heart. This is wrong, and you do not need to stop having sex. If sex does bring on an angina pain, it may be helpful to take some GTN beforehand.
- **Driving.** You should inform your insurance company if you develop angina. There is usually no restriction for driving your own car unless pains occur at rest, or while driving. However, bus, lorry, and taxi drivers who have angina must stop driving and contact the DVLA.

## Some other points about angina

### Stable angina

In most cases, angina pains come on with a certain amount of exercise, and you can predict the level of exercise that triggers a pain. This common situation is called 'stable angina'. More than a million people in the UK are thought to have stable angina. With treatment, most pains can be prevented. In time, over months or years, the pains may come on with a lesser amount of exercise.

### Unstable angina

If the pattern of your pains changes fairly suddenly, and the pains come on with less and less exercise, or while you are resting, this is called 'unstable angina'. You should tell your doctor soon if the pattern changes in this way.

### Heart attack

If you have angina, you have a higher than average risk of having a heart attack (myocardial infarction). Briefly, a heart attack usually occurs when there is a sudden total blockage of a coronary artery. This is caused by a blood clot which forms over a patch of atheroma, and blocks the blood supply to a segment of heart muscle. But, your risk of a heart attack is much reduced if you take aspirin and a statin - as discussed above.

If you have chest pain which lasts longer than 15 minutes, or is different or more severe than usual, then call an ambulance immediately. It may be a heart attack and immediate hospital care is needed.

## Further help and information

### *British Heart Foundation*

14 Fitzhardinge Street, London W1H 6DH

Tel: 0845 070 8070 Tel (Admin): 020 7935 0185 Web: [www.bhf.org.uk](http://www.bhf.org.uk)

Provides information on all aspects of heart disease to the public and health professionals.

### *Heart UK*

7 North Road, Maidenhead, Berkshire, SL6 1PE

Tel: 01628 628 638 Web: [www.heartuk.org.uk](http://www.heartuk.org.uk)

Committed to raising awareness of heart disease in the UK and stressing the importance of a healthy lifestyle in reducing the risk of suffering from it. In particular, Heart UK provides information for patients and families with inherited high cholesterol.

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Comprehensive patient resources are available at [www.patient.co.uk](http://www.patient.co.uk)