

# Angina

Angina is a pain that comes from the heart. It is usually caused by narrowing of the coronary (heart) arteries. Usual treatment includes a statin medicine to lower your cholesterol level, low-dose aspirin to help prevent a heart attack, and a beta-blocker medicine to help protect the heart and to prevent angina pains. An angiotensin-converting enzyme (ACE) inhibitor medicine is advised in some cases. Sometimes angioplasty or surgery are options to widen, or to bypass, narrowed arteries.

## What is angina?

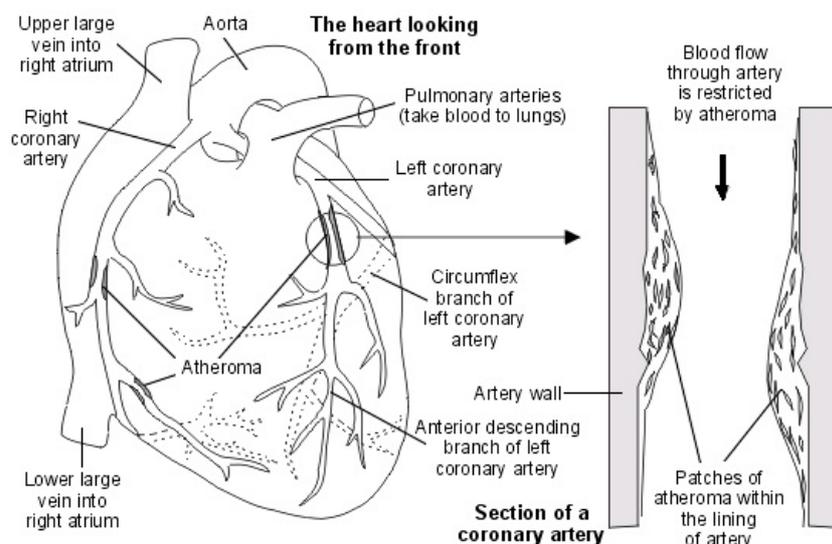
Angina is a pain that comes from the heart. Each year about 20,000 people in the UK develop angina for the first time. It is more common in people over the age of 50 years. It is also more common in men than women. Sometimes it occurs in younger people.

This leaflet is about the common type of angina which is caused by narrowing in the coronary arteries of the heart. Sometimes angina can be 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 heart pumps blood into arteries 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. They are the first arteries to branch off the aorta. This is the large artery taking blood from the heart to the rest of 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, or parts, of your heart muscle.

The blood supply may be good enough when you are resting. When your heart works harder (when you walk fast or climb stairs and your heart rate increases) your heart muscle needs more blood and oxygen. If the extra blood that your heart needs cannot get past the narrowed coronary arteries, the heart responds with pain.

The narrowing of the arteries is caused by atheroma. Atheroma is like fatty patches or plaques that develop within the inside lining of arteries. (This is similar to water pipes that get furred up with limescale.)

Plaques of atheroma may gradually form over a number of years. They may be 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?

### Typical and common angina symptoms

The common symptom is a pain, ache, discomfort or tightness that you feel across the front of the chest when you exert yourself. For example, when you walk up a hill or against a strong, cold wind. 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. If you take some glyceryl trinitrate (GTN) - it should go within 1-2 minutes (see 'Glyceryl trinitrate' section, below).

Angina 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.

### Less typical symptoms that sometimes occur

Some people have nontypical pains - for example, pains that develop 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.

Some people with angina also become breathless when they exert themselves. Occasionally, this is the only symptom and there is no pain.

## What tests will I have?

If you have suspected angina, tests are usually advised:

- **A blood test** to check for anaemia, thyroid problems, kidney problems, a high glucose level, and a high cholesterol level, as these may be linked with angina.
- **A heart tracing called an electrocardiograph (ECG)**. This can be useful. However, a routine ECG may be normal if you have angina. In fact, more than half of people with angina have a normal resting ECG.

## How do doctors know that I have angina?

In many cases the diagnosis is made by doctors based on the typical symptoms. No further tests may then be necessary. Tests are advised in some cases when the diagnosis is not clear, or sometimes to assess the severity of the condition. The test or tests that have will depend on what is available locally and whether the test is suitable for you. One or more of these may be advised:

- **Myocardial perfusion scintigraphy** is a test which is often done to confirm the diagnosis of angina. This test involves having an injection of a small amount of radioactive substance. A special camera, known as a gamma camera, is moved around you for 10-20 minutes. The gamma camera picks up the radioactive trace and produces pictures to reveal how well blood is reaching the heart. This is done both when you are resting and when your heart is beating faster. You may be asked to increase your heart rate by exercising (for example, by walking or jogging on a treadmill).
- **Echocardiography** is an ultrasound of the heart. During this test you may be asked to exert yourself or be given an injection to make your heart work harder. The operator will then be able to see your heart working under stress.
- **An MRI scan** can also show how your heart works under stress, as above. Some people may find MRI scans difficult. You need to lie very still in a confined space.
- **An angiogram** may be recommended for some people. 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. See separate leaflet called '*Coronary Angiography*' for details.

A test called exercise ECG has been used for many years to diagnose and assess the severity of angina. This is an ECG taken whilst you run on a treadmill, or bike. Certain changes in the pattern of the ECG that occur with exercise are typical in people with angina. However, this test is done less often these days due to more modern tests (described above) becoming available.

## 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 Cardiovascular Diseases*'.

Briefly, risk factors that can be modified and may help to prevent angina from getting worse include:

- **Smoking.** If you smoke, you should make every effort to stop.
- **High blood pressure.** Your blood pressure should be checked regularly, at least once a year, if you have angina. If it is high, it can be treated.
- **If you are overweight,** losing some weight is advised. Losing weight will reduce the amount of workload on your heart and also help to lower your blood pressure.
- **High cholesterol.** This should be treated if it is high.
- **Inactivity.** You should aim to do some moderate physical activity 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 physical activity may not be so good. Ask your doctor to confirm that you can undertake regular physical activity.)
- **Diet.** You should aim to eat a healthy diet. A healthy diet means:
  - At least five portions (and ideally 7-9 portions) of a *variety of* fruit and vegetables per day.
  - You should not eat much fatty food such as fatty meats, cheeses, full-cream milk, fried food, butter, etc. Ideally you should use low-fat, monounsaturated or polyunsaturated spreads.
  - Try to include 2-3 portions of fish per week, at least one of which should be oily (such as herring, mackerel, sardines, kippers, salmon, or *fresh* tuna).
  - If you eat red meat, it is best to eat lean red meat, or eat poultry such as chicken.
  - If you do fry, choose a vegetable oil such as sunflower, rapeseed or olive.
  - Try not to add salt to food, and limit foods which are salty.

- **Alcohol.** Some research suggests that drinking a small amount of alcohol may be beneficial for the heart. The exact amount is not clear, but it is a small amount. So, do not exceed the recommended amount of alcohol as more than the recommended upper limits can be harmful. That is, men should drink no more than 21 units of alcohol per week, no more than four units in any one day, and have at least two alcohol-free days a week. Women should drink no more than 14 units of alcohol per week, no more than three units in any one day, and have at least two alcohol-free days a week. Pregnant women, and women trying to become pregnant, should not drink alcohol at all. 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.

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

The main aims of treatment are:

- To prevent angina pains as much as possible and to ease pain quickly if it occurs.
- To limit further deposits of atheroma as much as possible. This prevents or delays the condition from worsening.
- To reduce the risk of having a heart attack.

## Treatments that are advised in most cases

### Lifestyle measures to reduce risk factors

These are discussed above.

### Glyceryl trinitrate (GTN)

This medicine comes as tablets or sprays. You take a dose under your tongue as required when your angina 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.

You should always carry your GTN spray or tablets with you. 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 five minutes. If the pain persists for 10 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 every eight weeks and should 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 that is made in the liver from fatty foods that you eat. Cholesterol is involved in forming atheroma. As a rule, the higher the blood cholesterol level, the greater the risk of developing atheroma. However, whatever your cholesterol level, a reduction in the level is usually advised if you have angina.

Statin medicines lower the blood cholesterol level by blocking an enzyme which is needed to make cholesterol in the liver. There are several different statin medicines to choose from.

### Aspirin or another antiplatelet medicine

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 on to a patch of atheroma inside an artery they can form a clot (thrombosis). Therefore, 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 daily. This is a much smaller dose than that 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. Options then include taking an additional medicine to protect the gut, or using another antiplatelet medicine such as clopidogrel. See leaflet called '*Aspirin and Other Antiplatelet Medicines*' for details.

### **A beta-blocker medicine**

Beta-blockers block the action of certain hormones such as adrenaline, which increase the rate and force of the heartbeat when you exert yourself or are anxious. Therefore, when taking a beta-blocker, less oxygen is needed by the heart and angina pains are prevented, or occur less often.

Beta-blockers are also thought to have some protective effect on the heart muscle, which may reduce the risk of developing complications.

### **An angiotensin-converting enzyme (ACE) inhibitor medicine**

There are several types and brands of ACE inhibitors. These medicines prevent a build-up of fluid by interfering with the enzyme angiotensin which is involved in regulating body fluid. ACE inhibitors also have a protective effect on the heart and may slow down the progression of heart failure.

An ACE inhibitor is usually prescribed to people with angina who are shown to have a reduced function of the left ventricle of the heart or who have had a heart attack (myocardial infarction). In these situations there is good evidence that an ACE inhibitor improves the outlook. However, it is uncertain whether an ACE inhibitor should be taken routinely by people with angina who do not have these other heart problems. It is hoped that research will clarify this issue. In the meantime, some doctors do prescribe an ACE inhibitor to all their patients with angina.

## **Other treatments that may be advised**

### **Other medicines to prevent angina pains**

A beta-blocker (described above) may be sufficient to prevent angina pains but other medicines are available if required. They fall into three main groups:

- **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.
- **Nitrate medicines** work in a similar way to GTN but last for longer in the body.
- **Potassium-channel blockers** work in a similar way to nitrates. They relax the blood vessels supplying the heart.

There are several types and brands in each group. They are all good at preventing angina pains. 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 two or three medicines to prevent angina pains.

The possible side-effects vary between the different medicines. Therefore, 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, to prevent your pains, but with minimal side-effects.

**Note:** even when taking regular medication to prevent angina pains, you can still take GTN for breakthrough angina pains that may still occur from time to time.

The treatment of angina is a developing area of medicine. New treatments continue to be developed and are likely to be introduced in the near future.

### Non-medicine treatments

These are called angioplasty and coronary artery bypass graft (CABG) surgery. You may be offered one of these procedures if:

- You have pains not controlled by medicines. OR,
- The site and severity of the atheroma deposits are particularly suited to one of these treatments. In some cases this may even be if you have few or no pains, as the overall outlook may be improved in certain circumstances.

Your doctor will advise if angioplasty or CABG is worth considering. You may like to see the guidelines doctors follow regarding this issue which are at the end of this article.

- **Angioplasty** - in this procedure a tiny wire with a balloon at the end is put into a large artery in your groin or arm. It is then passed up to your heart and into the narrowed section of a coronary artery, using X-ray guidance. The balloon is then blown up inside the narrowed part of the artery to open it wide again. A stent may be inserted which works to keep the artery open. This is like a small coiled spring which expands and holds the artery open. 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 (CABG surgery) to bypass the narrowed sections of arteries with healthy blood vessel segments (grafts) which are taken from other parts of the body. More blood can then get past into the heart muscle. Not all people with angina are suitable for this operation, 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 physical activity is usually advised. You will normally be encouraged to exercise regularly. Physical activity helps to get the heart 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 and flying.** There is usually no restriction for driving your own car unless pains occur at rest, with emotion or while driving. But, you must inform your insurance company if you have angina. People with PCV or LGV licences, who have angina, must stop driving and contact the DVLA. As regards flying, in general, if you can climb 12 stairs and walk 100 metres on the level without pain or getting very breathless, you are fit to fly as a passenger. People with frequent angina pains or unstable angina should avoid flying.

## Some other points about angina

### Stable angina and unstable angina

In most cases, angina pains come on with a certain amount of exertion and you can predict the level of exertion that triggers a pain. This situation is called stable angina. More than a million people in the UK have stable angina. It is common to have stable angina for many years and, with treatment, most pains can be prevented. Over months or years the pains may come on with a lesser amount of exertion if the condition gradually gets worse.

If the pattern of your pain changes fairly suddenly and the pains develop after minimal exertion, or while you are resting, this is called unstable angina. This is an emergency and needs immediate medical care.

### Heart attack

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

### Prolonged pain

If you have a pain that lasts longer than 10 minutes, or is different or more severe than usual, then call an ambulance immediately. It may be unstable angina or a heart attack and immediate medical care is needed.

### Immunisation

People with angina should be immunised against pneumococci (bacteria which can cause pneumonia, meningitis and some other infections) and also have an annual influenza vaccination.

## Further help and information

### British Heart Foundation

Greater London House, 180 Hampstead Road, London, NW1 7AW  
Tel (Heart Help Line): 0300 330 3311 Web: [www.bhf.org.uk](http://www.bhf.org.uk)  
For advice and information on all heart conditions.

### British Cardiac Patients Association

15 Abbey Road, Bingham, Notts, NG13 8EE  
Tel (Helpline): 01223 846845 Web: [www.bcpa.co.uk](http://www.bcpa.co.uk)

Heart patients, their families and carers may find investigations or treatments difficult to understand and hard to accept. It can be a relief to share thoughts and concerns with people who have successfully passed through similar anxieties and problems.

## Further reading & references

- *Management of Stable Angina Pectoris*, European Society of Cardiology (2006)
- *Stable angina*, NICE Clinical Guideline (July 2011); The management of stable angina
- Fernandez SF, Tandar A, Boden WE; Emerging medical treatment for angina pectoris. *Expert Opin Emerg Drugs*. 2010 Apr 13.

Original Author: Dr Tim Kenny

Current Version: Dr Hayley Willacy

Peer Reviewer: Dr Tim Kenny

Last Checked: 14/06/2012

Document ID: 4193 Version: 45

© EMIS

**Disclaimer:** This article is for information only and should not be used for the diagnosis or treatment of medical conditions. EMIS has used all reasonable care in compiling the information but make no warranty as to its accuracy. Consult a doctor or other health care professional for diagnosis and treatment of medical conditions. For details see our [conditions](#).

View this article online at [www.patient.co.uk/health/Angina.htm](http://www.patient.co.uk/health/Angina.htm).

Discuss Angina and find more trusted resources at [www.patient.co.uk](http://www.patient.co.uk).

EMIS is a trading name of Egton Medical Information Systems Limited.