

# ANTI-ANGINA DRUGS

Angina is chest pain produced when insufficient oxygen reaches the heart muscle. This is usually caused by a narrowing of the blood vessels (coronary arteries) that carry blood and oxygen to the heart muscle. In the most common type of angina (classic angina), pain usually occurs during physical exertion or emotional stress. In variant angina, pain may also occur at rest. In classic angina, the narrowing of the coronary arteries results from deposits of fat – called atheroma – on the walls of the arteries. In the variant type, however, angina is caused by contraction (spasm) of the muscle fibres in the artery walls.

Atheroma deposits build up more rapidly in the arteries of smokers and people who eat a high-fat diet. This is why, as a basic component of angina treatment, doctors recommend that smoking should be given up and the diet changed. Overweight people are also advised to lose weight in order to reduce the demands placed on the heart. While such changes in lifestyle often produce an improvement in symptoms, drug treatment to relieve angina is also frequently necessary.

The drugs used to treat angina include beta blockers, nitrates, calcium channel blockers, and potassium channel openers.

## Why they are used

Frequent episodes of angina can be disabling and, if left untreated, can lead to an increased risk of a heart attack. Drugs can be used both to relieve angina attacks and to reduce their frequency. People who suffer from only occasional episodes are usually prescribed a rapid-acting drug to take at the first signs of an attack, or before an activity that is known

to bring on an attack. A rapid-acting nitrate – glyceryl trinitrate – is usually prescribed for this purpose.

If attacks become more frequent or more severe, regular preventative treatment may be advised. Beta blockers, long-acting nitrates, and calcium channel blockers are used as regular medication to prevent attacks. The introduction of adhesive patches to administer nitrates through the patient's skin has extended the duration of action of glyceryl trinitrate, making treatment easier.

Drugs can often control angina for many years, but they cannot cure the disorder. When severe angina cannot be controlled by drugs, then surgery to increase the blood flow to the heart may be recommended.

## How they work

Nitrates and calcium channel blockers dilate blood vessels by relaxing the muscle layer in the blood vessel walls (see also Vasodilators, p.56). Blood is more easily pumped through the dilated vessels, reducing the strain on the heart.

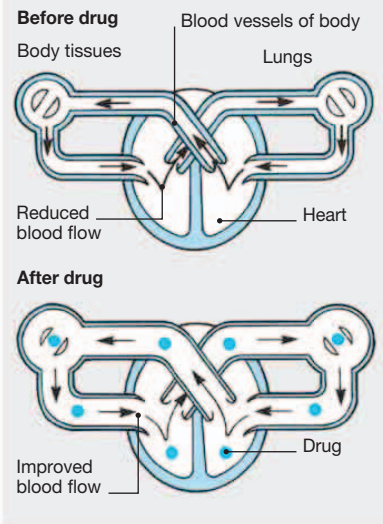
Beta blockers reduce heart muscle stimulation during exercise or stress by interrupting signal transmission in the heart. Decreased heart muscle stimulation means less oxygen is required, reducing the risk of angina attacks. For further information on beta blockers, see p.55.

## How they affect you

Treatment with one or more of these medicines usually effectively controls angina. Drugs to prevent attacks allow sufferers to undertake more strenuous activities without provoking pain, and if an attack does occur, nitrates usually provide effective relief.

## ACTION OF ANTI-ANGINA DRUGS

Angina pain occurs when the heart muscle runs short of oxygen as it pumps blood round the circulatory system. Nitrates, calcium channel blockers, and potassium channel openers reduce the heart's work by dilating blood vessels. Beta blockers impede the stimulation of heart muscle, reducing its oxygen requirement, thus relieving angina.



These drugs do not usually cause serious adverse effects, but they can produce a variety of minor symptoms. By dilating blood vessels throughout the body, the nitrates and calcium channel blockers can cause dizziness (especially when standing) and may cause fainting. Other possible side effects are headaches at the start of treatment, flushing of the skin (especially of the face), and ankle swelling. Beta blockers often cause cold hands and feet, and sometimes they may produce tiredness and a feeling of heaviness in the legs.

## COMMON DRUGS

### Beta blockers (see p.55)

#### Nitrates

Glyceryl trinitrate \*  
Isosorbide dinitrate/  
mononitrate \*

#### Potassium channel opener

Nicorandil \*

#### Other drugs

Aspirin \*  
Ivabradine  
Simvastatin \*

### Calcium channel blockers

Amlodipine \*  
Diltiazem \*  
Felodipine \*  
Nicardipine  
Nifedipine \*  
Verapamil \*

### Heparin/low molecular weight heparins \*

Aspirin \*  
Dalteparin  
Enoxaparin

\* See Part 3

## CALCIUM CHANNEL BLOCKERS

The passage of calcium through special channels into muscle cells is an essential part of the mechanism of muscle contraction (see right). These drugs prevent movement of calcium in the muscles of the blood vessels and so encourage them to dilate (see far right). The action helps to reduce blood pressure and relieves the strain on the heart muscle in angina by making it easier for the heart to pump blood throughout the body (see Action of anti-angina drugs, above right). Verapamil also slows the passage of nerve signals through the heart muscle. This can be helpful for correcting certain arrhythmias.

