

# Arterial Thrombosis

A blood clot within an artery is known as an arterial thrombosis.

Arterial thrombosis is responsible for heart attacks, strokes and peripheral vascular disease (thrombosis in leg arteries).

Heart attacks and strokes are a major cause of death and serious illness, and in the UK 25% of male deaths are due to a heart attack, while about 12% of deaths are due to a stroke. Strokes are also the major cause of disability in the Western world.

## The causes of arterial thrombosis

Arterial thrombosis usually affects individuals who already have **atherosclerosis**, or narrowing of the arteries. Atherosclerosis causes the walls of the arteries to 'fur up' with deposits of atheroma, a porridge-like substance.

Atherosclerosis tends to develop in areas where the blood flow is more turbulent, for example where blood vessels branch off. It usually takes many years to build up. But due to modern Western lifestyles, a child reaching his or her teenage years will already have signs of atherosclerosis in the major arteries.

This process is accelerated if the body is exposed to the major risk factors. It also occurs more frequently as people become older and in those with a strong family history of the condition.

## Risk factors for arterial thrombosis

The main risk factors for arterial thrombosis include:

- Smoking
- High blood pressure
- Increased levels of cholesterol
- Diabetes
- Increasing age
- Family history
- Poor diet
- Excess body weight
- Physical inactivity.

Of these, the major risk factors are smoking, high blood pressure (hypertension), and increased cholesterol levels.

## Symptoms of arterial thrombosis

The build up of atheroma causes the narrowing of the arteries, which can lead to heart disease and heart attacks, strokes or peripheral vascular disease.

### Symptoms of heart disease

Atheromatous heart disease is caused by 'furring up' of the arteries surrounding the heart. It can lead to a condition known as angina.

The symptoms of angina include chest pain during exercise or when feeling emotional stress. The pain usually goes away when you stop exercising or calm down.

The heart needs more blood than usual when it beats faster, due to exercise or emotion. If the arteries are narrowed by atheroma, this prevents enough blood reaching the heart to supply oxygen and nutrition to the muscles. Pain results from the heart muscle being deprived of oxygen.

## Symptoms of a heart attack

A heart attack, or *myocardial infarction*, occurs when a clot blocks one of the arteries supplying blood to the heart. This is nearly always due to narrowing of the artery by atherosclerosis.

During a heart attack, the area of the heart muscle supplied by the artery loses its blood supply and dies. If this is a large and vital area of muscle, the heart may not be able to pump blood effectively, and heart failure will occur.

In some people, the dying muscle can cause an irregular heartbeat, or arrhythmia, and the heart may stop beating altogether.

## Symptoms of a stroke

A stroke occurs either when an artery supplying part of the brain is blocked (*ischaemic stroke*) or when it ruptures and bleeds into the brain (*haemorrhagic stroke*).

About 80% of strokes are ischaemic. In an ischaemic stroke the area of the brain supplied by the artery loses its blood supply and cannot survive. The blood clot causing this problem may come from an area of atheroma in one of the neck arteries, or from the heart.

## Ischaemic stroke

During the last 25 years there have been major advances in treatment for ischaemic stroke. This is mostly due to advances in brain imaging and the development of trials, studying the use of antithrombotic drugs.

At present 'clot-busting' treatment is available in a few hospitals. However this treatment is not always successful following a stroke, as in some cases there is bleeding into the area of the damaged brain.

Other treatments include aspirin and drugs to control blood pressure.

## Symptoms of peripheral vascular disease

Peripheral vascular disease is a condition that usually affects the lower part of the leg. Although it is usually present in both legs, it is common for symptoms to affect one side only.

Peripheral vascular disease appears to affect men more than women and usually occurs after the age of 50. It is particularly common in people with diabetes and is rare in non-smokers.

Symptoms include pain on exercise, known as *intermittent claudication*, and cold extremities. Intermittent claudication usually occurs in the calf when walking, and is relieved by rest. If the condition becomes worse, there may also be pain during rest.

The pain is due to a lack of blood in the leg muscle during exercise, caused by narrow arteries in the lower leg and foot.

Occasionally a blood clot may lodge in one of the narrowed arteries. The leg then becomes cold, numb and pale, and loses its pulses. When this happens it is vital to restore the blood supply quickly, to prevent loss of the leg. This requires surgery to remove the clot.

## Prevention of arterial thrombosis

Prevention of arterial thrombosis is a vital part of health care. There are two main areas – **primary prevention** – which means preventing the disease from developing, and **secondary prevention** – preventing the disease from recurring.

There are two main ways of preventing arterial thrombosis – **lifestyle changes** and **medication**.

Someone who has suffered a heart attack or stroke will be given advice on making lifestyle changes. They may also be given medication, to reduce the risk of a further heart attack or stroke.

## Lifestyle changes

Lifestyle changes can have a major impact in reducing the risk of atherosclerosis, atherosclerotic disease and arterial thrombosis.

Encouraging people to **stop smoking** and discouraging people from starting is a major priority. The risk of having a heart attack falls immediately after stopping smoking. If someone stops smoking after a heart attack, the risk of dying in the next five years is reduced by about half.

A diet high in saturated fat, low in fruit and vegetables and high in salt is linked to an increased risk of developing atherosclerotic disease. The National Service Framework on coronary heart disease recommends that to reduce this risk, adults should adopt a **balanced diet** that includes:

- Less fat, particularly saturated fat
- At least five portions of fruit and vegetables a day
- Less salt
- At least two portions of fish (one of oily fish) each week

Evidence also shows that being overweight or obese increases the risk of atherosclerotic disease and is also linked to other risk factors such as raised cholesterol levels, high blood pressure, and increased blood glucose levels. All of these risk factors can be reversed by **losing weight**.

To reduce the risk of atherosclerotic disease, the National Service Framework on coronary heart disease also recommends that adults should undertake **30 minutes of moderate exercise** (such as walking, cycling or heavy housework) on at least five days a week.

Men who have a high alcohol intake (defined as more than 28 units of alcohol each week) have an increased risk of high blood pressure. This increases the risk of having a stroke.

However, research suggests that drinking 1 to 4 units of alcohol daily for men, or 1 to 2 units daily for women, on five or six days a week, appears to offer some protection. These benefits appear to be related to alcohol in general, although the specific benefits of drinks such as red wine are currently being debated.

## Medication

Medication may be given following a heart attack or stroke. This includes:

- Antihypertensives
- Cholesterol-lowering agents
- Antithrombotic drugs.

All of these forms of medication have been shown to significantly increase an individual's chances of survival and to lessen the risk of having another heart attack or stroke.

There is also some evidence that folic acid may be beneficial.

## Treatment of arterial thrombosis

### Atheromatous heart disease

A number of treatments are available for atheromatous heart disease. These include *thrombolytic*, or 'clot busting' drugs, *cardiac stenting*; and *coronary artery bypass grafting*.

If someone has had a heart attack, they may be offered **thrombolytic drugs**, or 'clot busters'. These are given as an intravenous injection that breaks down the clot in the coronary artery, opens up the artery and allows blood to flow again.

**Cardiac stenting** involves widening a narrowed artery with a balloon and then placing a 'stent' – a tube made from stainless steel mesh – inside it, to prevent the artery from narrowing again.

**Coronary artery bypass grafting** involves cardiac surgery, where a vein from the legs or from another artery inside the chest is used to bypass a narrowed area of the coronary artery.

## Preventing venous thrombosis

Anyone who has an arterial thrombosis can reduce the risk of venous thrombosis by making lifestyle changes like:

- Leading a physically active life
- Eating a healthy, balanced diet
- Avoiding becoming overweight or obese
- Avoiding long periods of immobility during illness or when travelling
- Stopping cigarette smoking.

Those with arterial thrombosis should also seek medical advice before major surgery, or when they are likely to be immobile for a long period, as this increases the risk of venous thrombosis.

Women should also seek medical advice before taking oral contraception or hormone replacement therapy, and when pregnant or planning to become pregnant.

**More advice on healthy living can be found at [www.dh.gov.uk](http://www.dh.gov.uk)**

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