



## Medicine for Managers

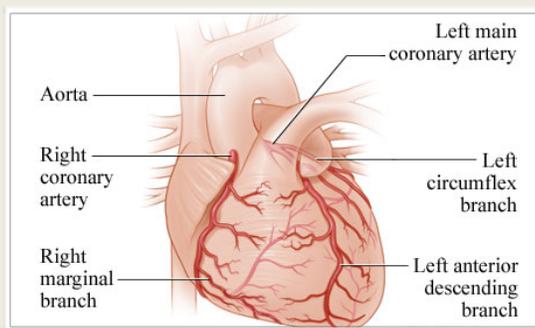
Dr Paul Lambden BSc MB BS BDS FDSRCS MRCS LRCP DRCOG MHSM

# Heart Attack

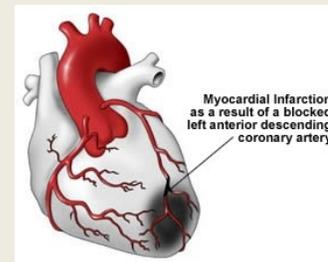
Cancer has now overtaken heart disease as the principal cause of death in the United Kingdom. It is interesting to note that, in the 1960s, 7 out of 10 heart attacks were fatal; today over 7 out of 10 patients survive. In the community there are a million men and nearly 400,000 women who have survived a heart attack. However, the disease still results in 100,000 admissions a year.

A heart attack (*myocardial infarction*) occurs when the blood flow to a part of the heart is blocked. The blockage results in *acute ischaemia* (sudden cessation of supply of the oxygen and nutrients carried by the blood) and results in the death of the part of the heart which was dependent on that supply.

The illustration shows the front of the heart with the left and right coronary arteries which branch directly from the *aorta*. As the arteries pass around and through the heart, they branch into smaller and smaller vessels. The larger the vessel that is blocked, the greater the area of muscle and other heart structures that are affected and the more devastating the result.



The illustration shows an area of heart destruction (*infarction*) as a result of a blockage of one of the arteries. As the damaged area heals, the dead heart muscle forms a scar which gradually shrinks and diminishes in size. Small heart attacks with minimal dead tissue culminate in hardly any visible damage at all. Larger areas result in areas of weakness in the heart wall which reduces heart muscle function and increases the risk of complications. Major artery obstruction usually results in death.



The blockage in a heart artery is usually the result of the accumulation of deposits or *plaques* of *atheroma*. The condition, *atherosclerosis*, is the build-up of fibrous and fatty material inside the arteries. Disease of this type is called **Coronary Heart Disease** (CHD).

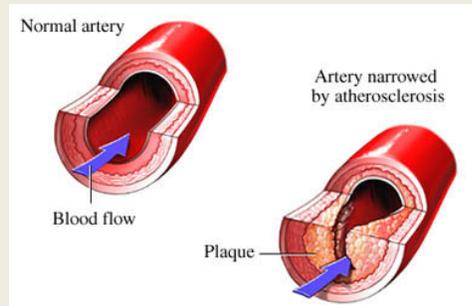
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The fatty material starts to accumulate in the arterial wall lining when we are quite young, thickens and scars to form the plaques which gradually enlarge, narrowing and ultimately blocking one or more arteries.

The most serious acute event occurs when one of the plaques ruptures and blood flowing over it clots, resulting in an acute blockage causing the heart attack.

Other factors contributing to the risk of heart disease include:



- **Age.** Heart attacks are more common in men over 45 and women over 55.
- **Smoking.** Both smoking and long-term exposure to an environment where there is second-hand smoke increase the risk of heart attack.
- **High cholesterol and triglycerides.** A high level of low-density lipoprotein cholesterol (LDL), also known as **bad cholesterol**, is most likely to narrow arteries. High levels of high-density lipoprotein cholesterol (HDL) may lower the risk. High levels of greasy foods high in triglycerides are likely to increase the risk of arterial disease and heart attack.
- **Hypertension** (high blood pressure) can damage the arteries.
- **Obesity**, linked to high cholesterol
- **Lack of physical activity.**
- **Stress**
- **Illicit drug use** such as cocaine or amphetamine.
- **Family history** of heart attacks. This may cause increased risk in circumstances

such as having a genetic predisposition to raised cholesterol.

Another cause of heart attack is **spasm of the coronary arteries**. The result is the acute shut down of a vessel preventing the heart getting nutrients and oxygen (**ischaemia**).

Tobacco and illicit drugs can cause spasm. More recently, it has been realised that infection with Covid-19 may also damage the heart and can lead to a heart attack.

The **symptoms and signs** of heart attack are well-known. The classic cardinal feature is of constricting chest pain, felt in the centre of the chest and often radiating into the arms, the neck or into the back.

Occasionally it spreads downwards causing abdominal pain. Sometimes the pain feels as though the chest is being compressed by a weight.

Other features may include:

- Breathlessness
- A cold sweat and pallor
- Nausea and vomiting
- Feelings of acute anxiety or panic
- Lightheadedness, dizziness and loss of consciousness.

Not all people suffer symptoms to the same degree. Sometimes the symptoms are relatively mild and others may have no symptoms at all (the so-called **silent infarct**) and are subsequently diagnosed by ECG or other tests.

Of course, for some people a **cardiac arrest** is the first and sudden feature of a heart attack.

Although some people have no warning of an impending heart attack and suddenly develop symptoms, for many others the first warning is

of episodes of chest pain which may be mild or more severe, usually brought on by exercise and relieved by rest.

This is called **angina**. It occurs because the narrowing of the arteries associated with heart disease reduces the blood flow to the heart and, during periods of exertion, the blood supply becomes relatively inadequate.

The heart becomes short of oxygen and there is an accumulation of the breakdown product, lactic acid, which causes the pain. When the pain occurs and the individual ceases exertion, the blood flow becomes adequate, the lactic acid is washed away and the pain subsides.

Episodes of angina may occur for days, weeks, months or even for years but, if untreated, will result in a heart attack as the obstruction to blood flow becomes too severe.

Patients with angina will normally carry with them a preparation of **nitroglycerin**, either as a tablet to be dissolved under the tongue, or a spray, also directed beneath the tongue, which circulates to the coronary arteries and dilates the vessels, improving the blood flow. It dilates other arteries as well and patients may experience headaches when using the drug. Headaches are an indication that the nitroglycerin is working.

Any patient with symptoms which might be indicative of a heart attack should be taken immediately to hospital by ambulance.

A patient with chest pain or other suggestive symptoms should **never** drive to the hospital because the symptoms may worsen.

Whilst waiting for the ambulance the individual should take nitroglycerin if he or she has any and also one adult (300 mg) aspirin, which may

be chewed and then swallowed. The individual should be seated in a comfortable position (although patients with chest pain may be restless and agitated and cannot sit or lie still), unless unconscious, when the recovery position should be adopted.

The pulse should be monitored when unconscious and if the pulse cannot be felt, standard cardio-pulmonary resuscitation should be commenced.

The procedure combines chest compressions with artificial ventilation to try to manually preserve brain blood flow until other measures can be adopted to restore circulation.

Once treated, some people recover well and can return to work after 2-3 weeks.

Others take much longer to recover and the final state of health when healing is complete depends on general health and fitness before the episode and the condition of the heart. Once discharged from hospital, it is important to gradually restore fitness by using graded exercises.

Cardiac rehabilitation services are available to help with the recovery.

After a heart attack, some patients suffer from complications, which are dependent on the severity and nature of the heart damage when the attack occurred.

- **Heart debility and failure.** The heart may suffer significant damage to the **muscle**, resulting in the pumping action of the heart being compromised. The result is that the heart cannot pump sufficient blood around the body to meet its needs. The resulting **heart failure** can become a chronic condition

resulting from extensive damage to the heart which may be permanent.

- **Development of arrhythmias.** This is abnormal electrical activity as a result of damage to the conducting tissue in the heart and leading to abnormal heart rhythms. Some arrhythmias can be treated medically but others may be serious, leading to death.
- **Sudden cardiac arrest.** This occurs when the heart, without warning, stops, usually because of an electrical failure.

**Life after a heart attack.** Even after suffering a heart attack, it is not too late to take stock of the state of health and to make changes which can help the heart function more effectively.

- **Lifestyle factors** are all the usual things that are always listed in similar situations. They include, losing weight, increasing exercise, reducing fatty food intake and having a healthier diet and of course stopping smoking. Better management of stress can help but that may be more easily said than done.
- **Medical Assessment.** It is important to have treatment for raised blood pressure and high cholesterol and those people with diabetes should ensure that it is as well controlled as possible
- **Medical treatment** These will include the treatment for the above medical problems including anti-hypertensive drugs, statins to lower cholesterol, drugs to reduce the stickiness of the blood and drugs to regulate diabetes as effectively as possible in sufferers.

No piece on Heart Attack or heart disease is complete without reference to the

### ***British Heart Foundation***

Their vision is of a world free from the fear of heart and circulatory diseases.

The Foundation is a United Kingdom charity and they raise money to support research, treatment and education.

Their contact details are:

*British Heart Foundation  
Greater London House  
5<sup>th</sup> Floor, 180 Hampstead Road  
London NW1 7AW  
Website: [www.bhf.org.uk](http://www.bhf.org.uk)  
0300 330 3311*

[paullambden@compuserve.com](mailto:paullambden@compuserve.com)