

## HEART ATTACK

### **What is a heart attack?**

When someone has a heart attack, it means there has been damage to a part of their heart muscle.

Before we explain how that damage happens, it helps to know about how the heart works.

### **How the heart works**

Your heart is a muscle that pumps blood around your body, delivering oxygen and other nutrients to all of your cells.

Your heart muscle needs its own supply of oxygen and nutrients so that it can pump blood around your body. The heart muscle gets its blood supply from its **coronary arteries**, which are on the outside of your heart.

### **What happens during a heart attack?**

A heart attack happens when there is a sudden loss of blood flow to a part of your heart muscle. It usually causes a sudden onset of pain or discomfort in the chest, and it may cause other symptoms.

### **What causes heart attacks?**

The cause of a heart attack is nearly always **coronary heart disease**.

This is a condition where the inside of one or more of the coronary arteries becomes narrowed because fatty deposits called **atheroma** have built up within the artery walls.

The fatty area of atheroma in the artery wall is called a **plaque**.

If a plaque cracks, a blood clot forms to try to repair the damaged artery wall.

This blood clot can totally block your coronary artery, causing part of your heart muscle to be starved of blood.

If this happens, the affected part of your heart muscle will begin to die, because it is not getting oxygen. This is a **heart attack**.

During a heart attack there is also the risk of having a **cardiac arrest**. This is when the heart stops pumping blood and normal breathing stops.

### **What needs to be done if you have a heart attack?**

A heart attack is when a part of the heart muscle suddenly loses its blood supply.

This is usually due to coronary heart disease.

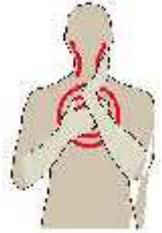
## The symptoms of a heart attack



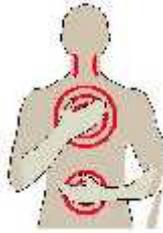
*Pain or discomfort in the chest that doesn't go away.*



*The pain may spread to the left or right arm ...*



*... or may spread to the neck and jaw.*



*You may feel sick or short of breath.*

## The symptoms of a heart attack

Pain or discomfort in the chest that doesn't go away the left or right arm or may spread to the neck and jaw or short of breath. Think quick ... act fast. Call 999 immediately.

## ACT FAST...

What to do if you think someone is having a heart attack

- 1 Send someone to call 999 for an ambulance immediately. If you are alone, go and call 999 immediately and then come straight back to the person.
- 2 Get the person to sit in a comfortable position, stay with them and keep them calm.
- 3 Give the person an adult aspirin tablet (300mg) if one is easily available, unless they're allergic to aspirin or they've been told not to take it.

If you don't have an aspirin next to you, or if you don't know if the person is allergic to aspirin, just get them to stay resting until the ambulance arrives.

If you have a heart attack, you need to have treatment as soon as possible. This will be to get the blood flowing to the damaged part of the heart muscle again as quickly as possible, and to limit the amount of permanent damage to your heart.

A suspected heart attack is treated as an emergency because of the possible damage to your heart, and the risk of death.

Early treatment can save your life and can limit the amount of damage to your heart muscle.

The first priorities are to:

- Take an ECG to find out whether you could be having a heart attack
- Reduce your pain or discomfort
- Start treatment to reduce or prevent damage to your heart, and
- Resuscitate you if you go into cardiac arrest. (A cardiac arrest can be triggered by a heart attack.)

### **ECG**

When you reach a hospital or paramedics arrive in ambulance, they will do a test on you called an **ECG** (electrocardiogram), to try to find out if your symptoms are due to a heart attack. This has to be done quickly, so as not to delay your treatment or transfer to hospital. The test involves putting small sticky patches called 'electrodes' on your arms, legs and chest. These are connected, by wires, to an ECG recording machine which records the electrical activity in your heart

### **Oxygen & Pain relief**

If you have a low level of oxygen in your blood, the ER medics will give you oxygen. To reduce your pain, they may give you morphine intravenously (through a vein), and glyceryl trinitrate (GTN) under your tongue.

### **Other medicines**

The ER staff will also give you aspirin, unless they know you are allergic to it or you cannot take it for another reason, or you have already taken enough aspirin while waiting for the ambulance.

They may also give you another medicine similar to aspirin, such as clopidogrel. If your ECG confirms that you are having a heart attack, you will need urgent treatment in hospital in the form of thrombolysis or Primary Angioplasty

If you are in an unstable condition, they may transfer you to a hospital with facilities for carrying out a primary angioplasty, just in case you need to have one.

### **What is thrombolysis?**

Thrombolysis is a treatment that helps to dissolve the blood clot that is blocking the coronary artery and restore the blood supply to the heart muscle.

It involves injecting a medicine such as **recteplase** or **tenecteplase** into the bloodstream, through a vein in the arm.

The injection should be given as soon as possible after the person starts having the symptoms of their heart attack.

This is why, if you ever think you may be having heart attack, it is vital to call 108

immediately, so that the blood supply to your heart muscle can be restored as quickly as possible.

### **What happens when I first get to the hospital?**

- When you get to the hospital, you will have a rapid assessment. This involves:
  - more ECGs
  - an assessment of your symptoms and medical history
  - a blood test called a troponin test (see below), and
  - Physical examinations, including measuring your blood pressure and monitoring your heart rhythm and heart rate.

### **Troponin test**

Troponins are proteins that are normally found within the cells of the heart. If your heart muscle is damaged, troponins leak into your blood, where they can be detected by a blood test.

They are released into your bloodstream quite slowly, so the level of troponin in your blood rises gradually over a few hours.

This means that the troponins may only be detected several hours after the start of the symptoms of a heart attack.

This is why the troponin test is not used as a way to decide on immediate treatment.

A troponin test can help show if there is damage to your heart muscle.

- **If your troponin test is positive** – that is, if you have a high level of troponins in your blood – it means that you have had a **heart attack**.
- **If the troponin test is negative several hours after your symptoms first started** – that is, if you don't have a high level of troponins in your blood – it means that your heart muscle was not damaged. This would confirm a diagnosis of **unstable angina**.

You may have more than one troponin test, especially if your first test is negative. This is because it can take some time for the troponins to be released into the bloodstream.

### **What treatment and other tests will I need while I'm in hospital?**

As you have had a heart attack, you will need to start taking medicines every day. If you already had a heart condition before you had your heart attack, you may already be taking some or all of these medicines.

The six main reasons for taking the medicines are to:

- help prevent another heart attack
- help reduce the risk factors for coronary heart disease
- such as high cholesterol levels or high blood pressure (a risk factor is something that increases your chance of getting a disease)
- prevent or treat the symptoms of angina
- help strengthen the pumping action of your heart

- protect your stents (if you have any), and
- Help reduce the risk of heart failure. (This is when the heart muscle is not able to pump blood around the body as well as it used to.

You will need to take some medicines from each of these five groups:

- Aspirin
- Clopidogrel or something similar
- Beta-blockers
- either ACE inhibitors or ARBs (angiotensin receptor blockers), and
- Statins.

You will need to continue taking these medicines after you leave hospital, and will need to take most of them for the rest of your life.

You may also need to take some other medicines, depending on your condition.

### **Cardiac arrest**

During a heart attack there is a risk of developing heart rhythm disturbances, including potentially life-threatening ones which can sometimes cause a cardiac arrest.

A cardiac arrest is when the heart stops pumping and the person stops breathing normally.

If this happens, resuscitation is needed immediately.

This is why it is so important to call 108 if you ever think you may be having a heart attack.

The paramedics or ambulance staff have a defibrillator with them. If you go into cardiac arrest, one or more electrical shocks from the defibrillator could restore a normal heart rhythm and save your life.