

SAVE A LIFE



The DEFIBRILLATOR at WIBC – Information pack for members

ABBREVIATIONS USED

AED Automated External Defibrillator

CPR Cardio Pulmonary Resuscitation

ALWAYS CALL 999 FIRST

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Cardiac arrest and heart attacks

It is important to understand the distinction between a heart attack and cardiac arrest as they are not the same and require different interventions. CPR and/or the use of an AED is not appropriate for an individual experiencing a heart attack and who is conscious, as the heart will still be beating, and the device will not administer a shock in these circumstances. However, a heart attack is still a life-threatening situation, and the emergency services should be alerted immediately. A heart attack can also very quickly lead to cardiac arrest, in which case administration of CPR and use of an AED may help to save the person's life.

Cardiac arrest

Cardiac arrest is when the heart stops pumping blood around the body. It can be triggered by a failure of the normal electrical pathway in the heart, causing it to go into an abnormal rhythm or to stop beating entirely. Oxygen will not be able to reach the brain and other vital organs. When a cardiac arrest occurs, the individual will lose consciousness and their breathing will become abnormal or stop. If basic life support is not provided immediately, the chances of survival are greatly reduced. Cardiac arrest can happen at any age and at any time. Possible causes include:

- heart and circulatory disease (such as a heart attack or cardiomyopathy)
- loss of blood
- trauma (such as a blow to the area directly over the heart)
- electrocution
- sudden arrhythmic death syndrome (SADS; often caused by a genetic defect)

When a cardiac arrest occurs, CPR can help to circulate oxygen to the body's vital organs. This will help prevent further deterioration so that defibrillation can be administered.

Heart attack

A heart attack (sometimes referred to as a myocardial infarction), is caused by a clot forming in one of the arteries that supply blood to the heart muscle. This prevents oxygen from getting to a particular region of the heart. As a result, cells in this region start to die. The longer this continues, the more damage is caused to the muscle. This damage is

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permanent. However, as the heart is still beating, CPR and defibrillation are not appropriate.

Not all people experiencing a heart attack will experience pain or discomfort. They will often remain conscious throughout. However, a heart attack is a serious, life-threatening emergency that requires immediate treatment and can trigger a cardiac arrest. If a person experiences a heart attack, the correct course of action is to call 999 immediately. The person should be made comfortable, ideally seated on the floor supported by a wall or a person knelt behind them and reassured until the ambulance arrives. Heart attacks are very rare among children, but the number of incidents in the adult population means that coronary heart disease (the most common cause of heart attacks) is the leading cause of death in the UK. Common symptoms of a heart attack include:

- chest pain or tightness, like a belt or band around the chest, and which is not relieved by rest
- pain which may spread to neck, jaw, back and arms
- feeling sick, sweaty, short of breath, lightheaded, dizzy or generally unwell along with discomfort in the chest



Figure 4: The UK standard sign for AEDs

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The chain of survival

In the event of a cardiac arrest, defibrillation can help save lives, but to be effective, it should be delivered as part of the chain of survival.



Figure 1: The chain of survival

Reproduced courtesy of Laerdal Medical

There are four stages to the chain of survival, and these should happen in order. When carried out quickly, they can drastically increase the likelihood of a person surviving a cardiac arrest. They are:

1. Early recognition and call for help. Dial 999 to alert the emergency services. The emergency services operator can stay on the line and advise on giving CPR and using an AED.
2. Early CPR – to create an artificial circulation. Chest compressions push blood around the heart and to vital organs like the brain. If a person is unwilling or unable to perform mouth-to-mouth resuscitation, he or she may still perform compression-only CPR.
3. Early defibrillation – to attempt to restore a normal heart rhythm and hence blood and oxygen circulation around the body. Some people experiencing a cardiac arrest will have a 'non-shockable rhythm'. In this case, continuing CPR until the emergency services arrive is paramount.
4. Early post-resuscitation care – to stabilise the patient.

Anyone is capable of delivering stages 1 to 3 at the scene of the incident. However, it is important to emphasise that life-saving interventions such as CPR and defibrillation (stages 2 and 3) are only intended to help buy time until the emergency services arrive, which is why dialling 999 is the first step in the chain of survival. Unless the emergency services have been notified promptly, the person will not receive the post-resuscitation

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care that they need to stabilise their condition and restore their quality of life (stage 4).

The chain as a whole is only as strong as its weakest link. Defibrillation is a vital link in the chain and, the sooner it can be administered, the greater the chance of survival.

Defibrillation and cardiopulmonary resuscitation (CPR)

When a person suffers a cardiac arrest, it is essential for effective CPR to be initiated as soon as possible; only dialling 999 should take precedence. The person performing CPR should not stop except where this is necessary in order to attach the pads or when instructed to do so by the AED, usually before it delivers a shock. If possible, somebody else should attach the pads to the patient while CPR continues.



Figure 2: Adult AED pad placement



Figure 3: Paediatric AED pad placement (for use on children aged up to 8 years of age, or weighing under 25 kg)⁶

Reproduced courtesy of the Resuscitation Council (UK)

An AED will only administer a shock if the patient's heart is in a shockable rhythm. The application of CPR can maximise the opportunities for defibrillation to be administered effectively. The AED will continue to analyse the patient's heart rhythm after each shock and will provide ongoing instructions about continuing CPR.

Some cardiac arrest patients will not present with a shockable rhythm (i.e. one which is suitable for defibrillation), and the AED will not administer a shock. In such cases, it is essential that CPR is maintained until the emergency services arrive.