Department of Education
www.education-ni.gov.uk

Automated External Defibrillators (AEDs)
Information for Schools

November 2024

Contents

Introduction

The Department of Education (DE) is providing Automated External Defibrillators (AEDs or 'defibrillators') to all grant-aided schools where existing provision is not in place. By the end of the current academic year, the Department expects all schools in Northern Ireland to have access to a defibrillator.

The Department has worked with the Northern Ireland Ambulance Service to develop this guidance to help schools understand the vital role that defibrillators can play in helping to save lives and the benefits this brings to pupils, staff and other users of their premises as well as the wider community.

We would like to thank the Northern Ireland Ambulance Service for their support and advice on this project.

Definitions

Automated External Defibrillator (AED) – Also referred to as a defibrillator. These are devices that are placed externally on the body to deliver an electric shock to restart the heart in the event of cardiac arrest**.**

Cardiopulmonary resuscitation (CPR) – When someone gives chest compressions to a person in cardiac arrest to keep them alive until emergency services arrive.

Electrocardiogram (ECG) – A simple test that can be used to check your heart's rhythm and electrical activity, often carried out by many defibrillators before delivering a shock.

Out of Hospital Cardiac Arrest (OHCA) – Cardiac arrests that happen to people who are not in hospital, under hospital care**.**

Rescue breaths – Also known as ‘mouth-to-mouth’. Breaths that are delivered to a person during CPR.

What is an AED?

An AED is a machine that is placed externally on the body and is used to give an electric shock when a person is in cardiac arrest i.e., when the heart suddenly stops pumping blood around the body.

Cardiac arrest can affect people of any age and without warning. If this happens, swift action is vital, and you must call 999 immediately for an ambulance. While the ambulance crew are on their way, early cardiopulmonary resuscitation (CPR) and prompt defibrillation can help save a person's life.

Survival rates as high as 70% have been reported where CPR and defibrillation are delivered promptly. Research shows that the chance of survival following the onset of a cardiac arrest decreases by 10% for every minute of delay in commencing treatment.

Please be assured that modern defibrillators are simple and safe to operate and use. Once attached, the defibrillator will automatically analyse the individual's heart rhythm and, if required, apply a shock to restart it or advise that CPR should be continued.

Figure 1: An AED

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.

Cardiac arrest

A cardiac arrest is a life-threatening emergency where a person's heart has suddenly stopped pumping blood around the body.

The person will be unconscious, unresponsive and will not be breathing normally or not breathing at all. It is essential to call 999 immediately for an ambulance. While waiting for the ambulance, anyone can help to save the person's life by delivering CPR and using a defibrillator.

CPR can help to circulate oxygen to the body's vital organs, which will help prevent further deterioration so that defibrillation can be administered.

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).

Heart attack

A heart attack happens when a blood clot blocks an artery around the heart. The person will usually experience chest pain or tightness that can radiate to the left arm and/or the neck. They may also feel sweaty or nauseated. They do not usually lose consciousness and continue breathing. It is vital that you call an ambulance immediately as this is a life-threatening situation.

If the person is still conscious, this means their heart is still beating and CPR and/or the use of a defibrillator is not appropriate. A defibrillator is only appropriate when the

heart has stopped beating. If the heart attack deteriorates to a cardiac arrest, then it is appropriate to start CPR and use a defibrillator.

The Chain of Survival

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

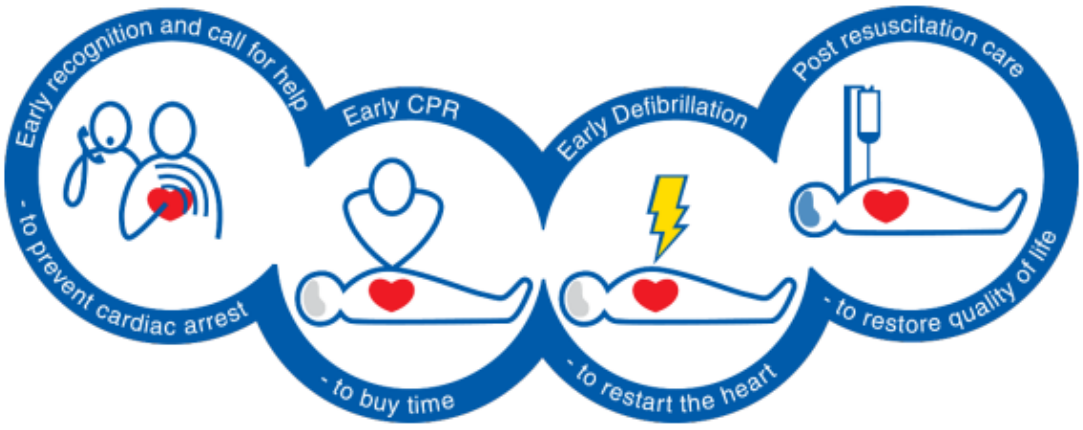

Figure 2: The Chain of Survival

There are four links 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. Place your phone on speaker so your hands are free. The emergency services operator can stay on the line and advise on giving CPR and using a defibrillator.

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 rescue breaths (also known as ‘mouth to mouth’), they 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. 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 link in the chain of survival.

Unless the emergency services have been notified promptly, the person will not receive the post-resuscitation 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 to call 999 immediately and for effective CPR to start as soon as possible.

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 defibrillator, usually before it delivers a shock. If possible, someone else should attach the pads to the patient while CPR continues.

If you are alone, you should not retrieve a defibrillator and instead, stay with the person in cardiac arrest and perform CPR as the ambulance service will bring a defibrillator to you.

Please check the advice on your device for the preferred pad placement.

Figure 3: Adult defibrillator pad placement

Figure 4:
Example 1 – paediatric defibrillator pad placement (for use on children aged up to 8 years of age or weighing under 25 kg)

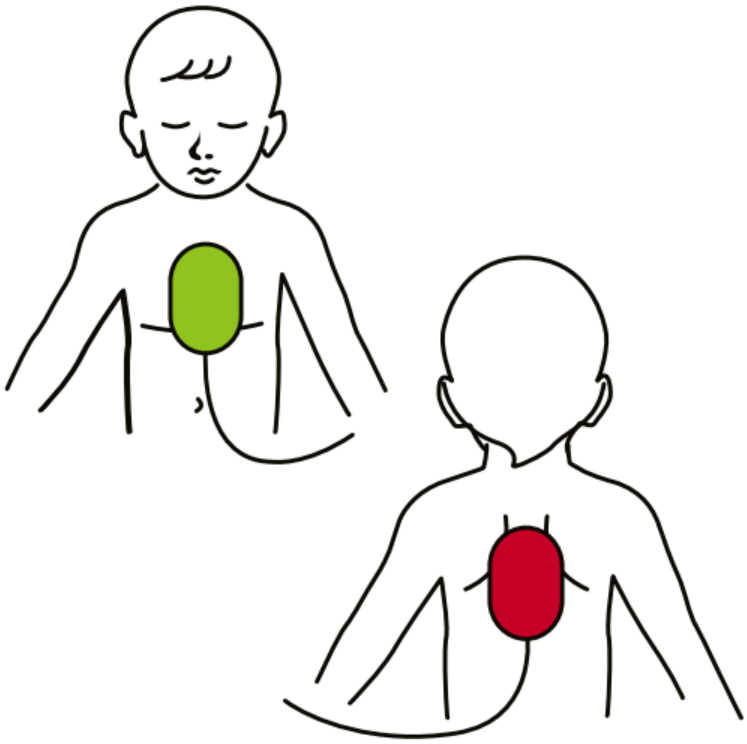

Figure 5:
Example 2 – paediatric defibrillator pad placement (for use on children aged up to 8 years of age or weighing under 25 kg)

Cardiopulmonary resuscitation (CPR)

It is important to do CPR when someone has a cardiac arrest. You should use the skills and sequence you have been taught or are aware of, even though administering CPR is different depending on the age of the person suffering cardiac arrest.

The basic steps for CPR on adults and children are outlined below and the ambulance call dispatcher will help you when you call. More information on how to administer CPR can be found in the Further Sources of Information Section.

CPR for adults

The below steps outline basic CPR for adults aged 18 years and older:

1. Call 999 or 112 for emergency help.
2. Give 30 chest compressions at the rate of 100-120 beats per minute.
3. Give 2 rescue breaths if trained and/or willing to do so.
4. If no rescue breaths are given, you should do continuous chest compressions.
5. Use a defibrillator if available.
6. Continue CPR (either 30 chest compressions and 2 rescue breaths or continuous chest compressions) until:
   a. Emergency help arrives.
   b. The person starts to show signs of life and starts to breathe normally.
   c. You are too exhausted to continue.
   d. A defibrillator is ready to use, and you follow the instructions voiced by the device.

CPR for children

The below steps outline basic CPR for children aged 1 to 17 years old:

1. Call 999 or 112 for emergency help.
2. Give 5 initial rescue breaths.
3. Give 30 chest compressions at the rate of 100-120 beats per minute.
4. Use a defibrillator if available.
5. Continue CPR at a rate of 30 chest compressions followed by 2 rescue breaths until:
   a. Emergency help arrives.
   b. The person starts to show signs of life and starts to breathe normally.

c. You are too exhausted to continue.

d. A defibrillator is ready to use.

Location and access

In view of the importance of responding swiftly to a cardiac arrest, defibrillators should be located strategically to ensure that they can be accessed quickly in an emergency.

EA maintenance will work with schools to ensure the location is highly visible so that anyone who needs to take one to an incident can locate the defibrillator quickly and easily.

Devices should ideally be situated no further than a two-minute brisk walk from the areas where they are most likely to be needed. This could include sports facilities and play areas (physical activity is linked to an increased likelihood of cardiac arrest).

All proposed defibrillator locations should be subject to a risk assessment taking into account:

- availability for timely deployment (including the likely time required to climb stairs, open doors, unlock a cabinet etc)
- health and safety risks (e.g., slip, trip and fall hazards)
- safety and security (e.g., is the area well-lit? Does the location render the defibrillator susceptible to tampering or vandalism and, if so, what measures would be proportionate to counter that risk?).

Schools should always ensure that all defibrillators are registered on The Circuit, the national defibrillator network. This will ensure they are visible to the ambulance services and means someone can be directed to the defibrillator location. You can find more information about The Circuit, including how to register your devices, at: https://www.thecircuit.uk

If a defibrillator is temporarily removed from its usual location other than in an emergency (for example, to provide cover at a sports event elsewhere on the school site), it is considered good practice to display a prominent notice to this effect in its usual location, giving details of an appropriate telephone number on which the member of staff who holds the defibrillator can be contacted.

Schools may wish to write the school details, including a contact telephone number, on the back of their defibrillator. This can be done on a sticker or in permanent marker. This will help the ambulance service, hospital staff, or rescuer return the device should it be taken offsite in an emergency.

Regular Checks, Maintenance and Consumables

Regular checks

Modern defibrillators undertake regular self-tests and, if a problem is detected, will indicate this by means of a warning sign or light on the machine. Schools should ensure that they have a procedure in place for defibrillators to be checked for such a warning on a regular (and no less frequently than weekly) basis, possibly by a designated person and have a method for recording when a check has taken place.

If defibrillators are kept in an internal or external cabinet, schools should also regularly check the condition of the cabinet, including the door closure and any lock.

Schools should consult the user manual of their defibrillator to ensure that they are aware of what to look for and what remedial action will need to be taken in the event of a fault.

Any fault which occurs during the defibrillator's warranty period and for which a solution cannot be found in the manual should be reported to the manufacturer immediately.

Many defibrillators may require schools to perform some additional monthly and/or annual checks to ensure that they are functioning correctly. Schools should consult the user manual for details and ensure that they have appropriate arrangements in place. Failure to perform these checks could potentially mean that the defibrillator fails to function properly when needed.

Consumables

Every defibrillator should be kept with a number of consumables to ensure that it is always ready for use. These are listed in the table below.

Item	Description
Scissors	These will enable rescuers to cut away a casualty's clothing if required. Make sure these are able to cut through material/clothing
Protective gloves	Rescuers may wear protective gloves to guard against infection if desired, but these are not necessary. The risk of infection is very low.
Towel or dry wipes	If the casualty is wet, a towel or dry wipes should be used to dry the chest in order to ensure that the pads are able to adhere properly. Pads need to have good contact with an individual's skin in order to effectively analyse their heart rhythm
Safety razor	Pads are designed to function with chest hair, but excessive amounts may prevent them from adhering to the casualty's chest and impair conductivity. In these situations, a safety razor should be used to dry-shave excessive chest hair where the electrodes are to be applied
Pocket mask/face shield	Rescuers may use a pocket mask or face shield to guard against infection while administering rescue breaths if desired, but this is not necessary. The risk of infection is very low. If a person is unwilling or unable to perform mouth-to-mouth resuscitation, they may still perform compression-only CPR.

Pads, safety razors, protective gloves and pocket masks need to be replaced after every incident.

Maintenance of AEDs

Some manufacturers may advise that the battery is replaced after an incident, whether or not the charge level on the battery indicator is showing as low; schools should check the device user manual for details.

Even when an incident has not taken place, batteries and pads have finite service lives and should be replaced after the period of time specified by the manufacturer. This will usually be upon reaching the expiry date, or in the case of batteries, when the battery indicator shows that the battery is low – whichever is the sooner.

The Department will make available funding to EA in future years for supply of replacement pads and batteries as required and also for replacement AEDs as current school devices need replaced. This should alleviate any concerns in regard to ongoing maintenance costs.

Replacing your defibrillator

Defibrillators have an anticipated service life, details of which should be included in the device's accompanying documentation. If not, please contact the supplier or manufacturer for details.

Resuscitation Council UK recommends that defibrillators are replaced once they reach the end of their anticipated service life, as do many manufacturers. If you currently have a defibrillator but believe it needs replaced, please contact the Department's Major Capital Implementation Team at MCIT@education-ni.gov.uk

The Department will make available funding to replace all defibrillators as they reach their end of service life.

Fact Check

Below are some common myths and misconceptions when it comes to defibrillators.

Myth:	AEDs are not safe to use
Fact:	AEDs are designed to be used by laypeople with little or no medical training.
Myth:	You can accidently shock someone with a defibrillator.
Fact:	When defibrillator pads are placed on a person, they will automatically read their heartbeat and will only deliver a shock if the person's heart is not beating. They will not shock someone who is not in a life-threatening rhythm.
Myth:	You have to be trained to use a defibrillator.
Fact:	Defibrillators are designed to be used by anyone with no prior training. AEDs are simple to use and designed to be intuitive. Most defibrillators talk to the user and guide them through the steps they need to take once the defibrillator has been opened. Most defibrillators also have pictures on the front of the device and on the pads to help you. There are many resources available to help raise awareness on how defibrillators are used and when one might be needed. Most CPR training also covers the use of defibrillators.
Myth:	Defibrillators are complicated.
Fact:	This is incorrect. Swift action is key when using a defibrillator. Defibrillators have been designed to be easy and straightforward to use, guiding users through the process.

Myth:	AEDs are only for medical professionals
Fact:	AEDs are designed for use by anyone, including bystanders in an emergency. In fact, bystanders using an AED can significantly increase the chances of survival for someone in sudden cardiac arrest.
Myth:	You should wait for emergency personnel to arrive before using an AED.
Fact:	Time is critical in cases of sudden cardiac arrest. If an AED is available, it should be used as soon as possible. Waiting for emergency responders may delay defibrillation and reduce the chances of survival.
Myth:	Only adults can use defibrillators.
Fact:	Defibrillators can be used by people of any age provided they are old enough to understand the instructions. Since 2022, defibrillator awareness has been a mandatory element of the Key Stage 3 curriculum.
Myth:	You need to keep detailed records every time the defibrillator is used.
Fact:	Any use of a defibrillator in an emergency has the potential to save a life. They are intended to be used to increase the chance of survival whilst the emergency services are on their way. You should always follow the instructions on the defibrillator and given by emergency services. The ambulance service may need a copy of the record kept on your defibrillator soon after an incident. This is to help medical teams understand the person's response to defibrillation and to help with their aftercare.

Sources of further information

Guidance on CPR and defibrillators

- British Heart Foundation – CPR and defibrillators: how to save a life
- NI Ambulance Service – Guidance for defibrillators
- A guide to Defibrillation; Resuscitation Council UK
- 2021 Resuscitation Guidelines; Resuscitation Council UK
- How to use a defibrillator; St John Ambulance

National Defibrillator Network

- The Circuit; British Heart Foundation

Defibrillator Maintenance

- Guide to Defibrillator Maintenance and upkeep | St John Ambulance
- Maintaining your defibrillator

CPR and AED Awareness within the Curriculum

- Community of Lifesavers Education Programme – CCEA