Public Access Defibrillator (PAD) – Churt Village Hall

Information Source: <http://www.communityheartbeat.org.uk/index.php>



**Why does Churt need PAD**

**Life expectancy**Following a Cardiac Arrest the chance of survival decreases by 23% per minute. It is therefore very important medical treatment starts as soon as possible. The UK Resuscitation Council suggests an AED should be available wherever medical treatment is more than 5 minutes away. In practical terms this means the whole of the UK.



**Survival: 5% with CPR alone; 50% with defibrillation**

**About Defibrillators or AEDs:**
A defibrillator delivers an electrical current through the chest which aims to shock the heart back into a normal rhythm allowing it to pump again. Rapid response using automated technology can significantly improve the quality of life of a survivor, as the longer the brain is starved of oxygen, the more damage that can occur. An AED is a portable defibrillator especially designed for people with no medical background. When applied to the victim, voice commands and screen messages will guide the user step-by-step through the process and its intelligent technology will only allow it to shock a ‘shockable’ heart rhythm. AED technology opens a window for the public to take on a key role to support emergency services who would otherwise be hindered by the time it takes to reach the victim. It is argued that AEDs should be as broadly deployed as fire extinguishers and first aid kits.

**About Sudden Cardiac Arrest:**
Sudden Cardiac Arrest or SCA is an electrical malfunction of the heart (most commonly Ventricular Fibrillation) in which the heart stops pumping blood to the body and brain due to an abnormal heart rhythm known as an arrhythmia. As the victim consecutively loses pulse, consciousness and ability to breathe, the victim is termed “clinically dead” and can only be physically brought back to life in a very small window of time using a defibrillator or AED.

**Survival: 5% with CPR alone; 50% with defibrillation**

The rate of survival of an SCA is dependent upon time. The quicker the intervention; the better the outcome. Brain death starts after 3 minutes so urgent action is needed, particularly in rural areas where it can take several minutes to get a competently trained person to the scene. PADs can be at the scene in a matter of minutes.



Recent evidence suggests that public access defibrillation is almost 10x more effective in saving lives than just CFR schemes alone. This is nothing to do with skills of the responders, but simply a factor of time to the patient. To give a good outcome, medical help needs to be present at the patient within 4-5 minutes.

Most CFR schemes attend only 10% - 20% of SCA events on average (source EMAS)

Very few CFR schemes offer a 24 hour, 7 day a week and 365 days a year service. However cPAD schemes can offer lifesaving resources to the general public as well as off duty/out of hours medical and CFR personnel.

One day, Public Access Defibrillators will be as common as road signs.

If an SCA occurs, start CPR straight away and call 999 without delay!

Get the AED/PAD and follow the instructions the AED unit gives you.

No one will criticise you for trying to save a life! The AED will not function unless it determines there is a need, so don’t worry about using one!

**What is an AED**

**Automated external defibrillator**

An **automated external defibrillator** or **AED** is a portable electronic device that automatically diagnoses the potentially life threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient,[[1]](http://www.communityheartbeat.org.uk/whatisanaed.php%22%20%5Cl%20%221) and is able to treat them through defibrillation, the application of electrical therapy which stops the arrhythmia, allowing the heart to re-establish an effective rhythm.

AEDs are designed to be simple to use for the layman, and the use of AEDs is taught in many first aid, first responder and basic life support (BLS) level CPR classes.[[2]](http://www.communityheartbeat.org.uk/whatisanaed.php#2)

**Usage**

**Conditions that the Device Treats**

An automated external defibrillator is used in cases of life threatening cardiac arrhythmias which lead to cardiac arrest. The rhythms that the device will treat are usually limited to:

1. Pulseless Ventricular tachycardia (shortened to VT or V-Tach) [[1]](http://www.communityheartbeat.org.uk/whatisanaed.php#1)
2. Ventricular fibrillation (shortened to VF or V-Fib)

In each of these two types of shockable cardiac arrhythmia, the heart is active, but in a life-threatening, dysfunctional pattern. In ventricular tachycardia, the heart beats too fast to effectively pump blood. Ultimately, ventricular tachycardia leads to ventricular fibrillation. In ventricular fibrillation, the electrical activity of the heart becomes chaotic, preventing the ventricle from effectively pumping blood. The fibrillation in the heart decreases over time, and will eventually reach asystole.

AEDs, like all defibrillators, are not designed to shock asystole ('flat line' patterns) as this will not have a positive clinical outcome. The asystolic patient only has a chance of survival if, through a combination of CPR and cardiac stimulant drugs, one of the shockable rhythms can be established, which makes it imperative for CPR to be carried out prior to the arrival of a defibrillator.

**Effect of Delayed Treatment**

Uncorrected, these cardiac conditions (ventricular tachycardia, ventricular fibrillation, asystole) rapidly lead to irreversible brain damage and death. After approximately three to five minutes, [[3]](http://www.communityheartbeat.org.uk/whatisanaed.php#3) irreversible brain/tissue damage may begin to occur. For every minute that a person in cardiac arrest goes without being successfully treated (by defibrillation), the chance of survival decreases by 23 percent. [[4]](http://www.communityheartbeat.org.uk/whatisanaed.php#4)

**Requirements for use**

AEDs are designed to be used by laypersons who ideally should have received AED training. This is in contrast to more sophisticated manual and semi-automatic defibrillators used by health professionals, which can act as a pacemaker if the heart rate is too slow (bradycardia) and perform other functions which require a skilled operator able to read electrocardiograms.

Bras with a metal underwire and piercings on the torso must be removed before using the AED on someone to avoid interference. [[5]](http://www.communityheartbeat.org.uk/whatisanaed.php#5)

A study analyzed the effects of having AEDs immediately present during Chicago's Heart Start program over a two year period. Of 22 individuals 18 were in a cardiac arrhythmia which AEDs can treat (Vfib or Vtach). Of these 18, 11 survived. More interestingly, of these 11 patients, 6 were treated by good Samaritan bystanders with absolutely no previous training in AED use.[[6]](http://www.communityheartbeat.org.uk/whatisanaed.php#6)[[7]](http://www.communityheartbeat.org.uk/whatisanaed.php#7)

**Placement and Availability**

Automated external defibrillators are generally either held by trained personnel who will attend events or are public access units which can be found in places including corporate and government offices, shopping centres, airports, restaurants, casinos, hotels, sports stadiums, schools and universities, community centres, fitness centres, health clubs, workplaces and any other location where people may congregate.

The location of a public access AED should take in to account where large groups of people gather, regardless of age or activity. Children as well as adults may fall victim to sudden cardiac arrest (SCA)

In many areas, emergency vehicles are likely to carry AEDs, with some ambulances carrying an AED in addition to manual defibrillators. Police or fire vehicles often carry an AED for first responder use. Some areas have dedicated community first responders, who are volunteers tasked with keeping an AED and taking it to any victims in their area. AEDs are also increasingly common on commercial airliners, cruise ships, and other transportation facilities.

In order to make them highly visible, public access AEDs often are brightly coloured, and are mounted in protective cases near the entrance of a building. When these protective cases are opened or the defibrillator is removed, some will sound a buzzer to alert nearby staff to their removal, though this does not necessarily summon emergency services; trained AED operators should know to phone for an ambulance when sending for or using an AED. In September 2008, the International Liaison Committee on Resuscitation issued a 'universal AED sign' to be adopted throughout the world to indicate the presence of an AED. [[8]](http://www.communityheartbeat.org.uk/whatisanaed.php#8)

A trend that is developing is the purchase of AEDs to be used in the home, particularly by those with known existing heart conditions. [[9]](http://www.communityheartbeat.org.uk/whatisanaed.php#9) The number of devices in the community has grown as prices have fallen to affordable levels. There has been some concern among medical professionals that these home users do not necessarily have appropriate training, [[10]](http://www.communityheartbeat.org.uk/whatisanaed.php#10) and many advocate the more widespread use of community responders, who can be appropriately trained and managed.

Typically, an AED kit will contain a face shield for providing a barrier between patient and first aider during rescue breathing; a pair of nitrile rubber gloves; a pair of trauma shears for cutting through a patient's clothing to expose the chest; a small towel for wiping away any moisture on the chest, and a razor for shaving those with very hairy chests. [[11]](http://www.communityheartbeat.org.uk/whatisanaed.php#11)

**Preparation for operation**

Most manufacturers recommend checking the AED before every period of duty or on a regular basis for fixed units. Some units need to be switched on in order to perform a self test; other models have a self test system built in with a visible indicator.

All manufacturers mark their pads with an expiry date, and it is important to ensure that the pads are in date. This is usually marked on the outside of the pads. Some models are designed to make this date visible through a 'window', although others will require the opening of the case to find the date stamp.

**Mechanism of operation**

An AED is external because the operator applies the electrode pads to the bare chest of the victim, as opposed to internal defibrillators, which have electrodes surgically implanted inside the body of a patient.

Automatic refers to the unit's ability to autonomously analyse the patient's condition, and to assist this, the vast majority of units have spoken prompts, and some may also have visual displays to instruct the user.

When turned on or opened, the AED will instruct the user to connect the electrodes (pads) to the patient. Once the pads are attached, everyone should avoid touching the patient so as to avoid false readings by the unit. The pads allow the AED to examine the electrical output from the heart and determine if the patient is in a shockable rhythm (either ventricular fibrillation or ventricular tachycardia). If the device determines that a shock is warranted, it will use the battery to charge its internal capacitor in preparation to deliver the shock. This system is not only safer (charging only when required), but also allows for a faster delivery of the electrical current.

When charged, the device instructs the user to ensure no one is touching the patient and then to press a button to deliver the shock; human intervention is usually required to deliver the shock to the patient in order to avoid the possibility of accidental injury to another person (which can result from a responder or bystander touching the patient at the time of the shock). Depending on the manufacturer and particular model, after the shock is delivered most devices will analyze the patient and either instruct CPR to be given, or administer another shock.

Many AED units have an 'event memory' which store the ECG of the patient along with details of the time the unit was activated and the number and strength of any shocks delivered. Some units also have voice recording abilities to monitor the actions taken by the personnel in order to ascertain if these had any impact on the survival outcome. All this recorded data can be either downloaded to a computer or printed out so that the providing organisation or responsible body is able to see the effectiveness of both CPR and defibrillation.

The first commercially available AEDs were all of a monophasic type, which gave a high-energy shock, up to 360 to 400 joules depending on the model. This caused increased cardiac injury and in some cases second and third-degree burns around the shock pad sites. Newer AEDs (manufactured after late 2003) have tended to utilise biphasic algorithms which give two sequential lower-energy shocks of 120 - 200 joules, with each shock moving in an opposite polarity between the pads. This lower-energy waveform has proven more effective in clinical tests, as well as offering a reduced rate of complications and reduced recovery time. [[12]](http://www.communityheartbeat.org.uk/whatisanaed.php#12)

**Simplicity of use**

Unlike regular defibrillators, an automated external defibrillator requires minimal training to use. It automatically diagnoses the heart rhythm and determines if a shock is needed. Automatic models will administer the shock without the user's command. Semi-automatic models will tell the user that a shock is needed, but the user must tell the machine to do so, usually by pressing a button. In most circumstances, the user cannot override a "no shock" advisory by an AED. Some AEDs may be used on children - those under 55 lbs (25 kg) in weight or under age 8. If a particular model of AED is approved for paediatric use, all that is required is the use of more appropriate pads. Some organizations, such as the American Heart Association, recommend that if paediatric AED pads are not available, adult pads should be used to determine if the child is in a shockable rhythm. There is insufficient evidence to suggest that a child, in a shockable cardiac arrest, can be "hurt" by an adult defibrillation energy setting.

All AEDs use an electronic voice to prompt users through each step. Because the user of an AED may be hearing impaired, many AEDs now include visual prompts as well. Most units are designed for use by non-medical operators. Their ease of use has given rise to the notion of public access defibrillation (PAD), which experts agree has the potential to be the single greatest advance in the treatment of out-of-hospital cardiac arrest since the invention of CPR.[[13]](http://www.communityheartbeat.org.uk/whatisanaed.php#13)

**Liability**

Automated external defibrillators are now easy enough to use that most countries include the "good faith" use of an AED by any person under the Good Samaritan laws.[[14]](http://www.communityheartbeat.org.uk/whatisanaed.php#14) "Good faith" protection under a Good Samaritan law means that a volunteer responder (not acting as a part of one's occupation) cannot be held civilly liable for the harm or death of a victim by providing improper or inadequate care, given that the harm or death was not intentional and the responder was acting within the limits of their training and in good faith. AEDs create little liability if used correctly.

## References

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| External links |  |

* <http://www.bhf.org.uk/>
* <http://www.communityheartbeat.org.uk/index.php>
* [FDA Heart Health Online: Automated External Defibrillator (AED)](http://www.fda.gov/hearthealth/treatments/medicaldevices/aed.html)
* [Resuscitation Council (UK)](http://www.resus.org.uk/)

Original Text taken from Wikipedia.

Frequently Asked Questions

**Is there a need?**

Sudden Cardiac Attack happens between 140,000 and 200,000 times a year in the UK, making it one of the UK’s largest killers. The potential for saving a life is dependent upon time, the faster medical help can be attained, the better the chance of survival. Clinical studies suggest you have less than 8 minutes from the event to save the life, this decreasing by 10-14% per minute. In rural areas it takes time to get medical help, so Community Public Access Defibrillators (cPAD) have a very important part to play in helping save lives in rural communities. cPAD schemes are reckoned to be about 10x more effective in saving life post hospital than CFR schemes alone. Your community needs to decide if you want one, but as SCA can happen to anyone at any time, and is not age related, better safe than sorry! Try timing yourself from your nearest Ambulance station

**Is your community signed up and supportive?**

Hindhead, Beacon Hill, Frensham and Churt are Hot Spots for an AED because of the more remote/rural location. Around Surrey, Kent & West Sussex, South East Coast Ambulance Trust (SECAmb) are deploying community AEDs to increase survival rates following a cardiac arrest. The deployment of AEDs is also driven by Communiuty First Responders, parish councils or Lions and round table who engage the support of the local communities, and co-ordinate fund raising and placement with the support of organisations like the Ambulance Service.

**Is there a minimum number of people needed to have a scheme?**

So long as there is one person supporting this, then this justifies the effort. There are already local schemes being established by householders individually in your community, and your village hall may already have a defibrillator, or someones house. Your local doctor surgery will have one too, but it is only available when the surgery is open. The ideal is to place a defib publicly to use these resources better to save more lives.

**How many people do we need to be trained?**

We suggest running a number of training sessions together with some form of online information. The aim is to encourage use through knowledge.. The UK RC guidelines suggest confirms that AED equipment is made available to non-trained people, the devices lead the user and is very straight forward.

**Who delivers the training, to what specification and importantly is the training free of charge?**

Training is provided by St John Ambulance, or the local ambulance service.

**Do we have to be Community Responders?**

No. CFR schemes are independent of this, but clearly trained responders can also use the cPAD equipment in an emergency. If you wish to establish a CFR scheme, this a matter for the local ambulance service. It is hoped that by having a cPAD scheme locally then this will encourage local communities to join first aid and CFR schemes. Many cPAD schemes are being established by CFR groups or ambulance services.

**What are the procedures for using the defibrillator?**

UK Resuscitation Council (UKRC) are the definitive guide to using cPAD equipment.

**What governance processes are in place?**

UKRC no longer require members of the public to be trained to use AEDs. This is because it is so easy to use one and very safe. Any training must be certified to make sure it conforms to UKRC guidelines, and additional training to HSE standards. Equipment is governed by the manufacturer who takes responsibility for maintenance and functional operation of the AED. This replicates, and exceeds, existing PAD schemes. All PAD locations and codes are notified to the local ambulance Trust, who record on their CAD systems. A copy of the notification form can be supplied. All PAD boxes give instructions to call 999. Daily and weekly checks are done on the cPAD equipment by the local scheme co-ordinator (who will be recognised by the ambulabnce trust), and in some cases by the local ambulance trust themselves too, to ensure fully operational equipment.

**What long term sustainability is there in place?**

The defibrillator manufacturer will support the service for 7 years, this being the life of the defibrillator and guarantees on the equipment. CHT have also negotiated a replacement service for supplies with the manufacturers.

**Who will be the responsible person to carry out regular serviceability checks on the machine replace batteries, pads etc and replace items following the use of the machine, downloading of information etc.?**

The Ambulance Service have agreed with the manufacturers to fully support all consumables for the seven year period, including post use replacement of consumables. This will be enacted by the local scheme. Local regular checking is undertaken by the supporting group through a checklist supplied, or by the local ambulance service. This is the same system as used for similar cPAD schemes, and the British Heart Foundation (BHF) national PAD schemes.

**What is the specification of the cabinet?**

The high visability green cabinet is a secure, vandal resistant IP65 certified and contains a thermostatically controlled heater, lighting and indicator lamps. It is manufactured to all relevant BS standards. Cost of running is estimated to be about £10-£30 per year. Normally shops, pubs and village halls house the units and supply the electricity. Permission of the owner of the building will be required.

**Why is the box green?**

There is no international or UK requirements for AED boxes to be a specific colour. Green is the internationally recognised colour for First Aid boxes. SECAmb has selected a box design to ensure the boxes provided are highly visible and therefore easy to find in poor light conditions.

**Do we need planning permission?**

Not normally. Planning permission is not normally required as this is emergency medical equipment.

**If the local ambulance service directed a person to a cPAD site and when they arrived the box had no defibrillator in the cabinet or when it was attempted to be used for some reason it failed to work, if as a community we had not reasonably tried to ensure that there are processes in place to reduce the risk of this happening would we be at serious risk of prosecution?**

Unlikely. It is rare for thefts to occur. All due process is taken to reduce the risk to the equipment malfunctioning or not being available. The cPAD box is vandal resistant, and checked weekly by the local scheme co-ordinator/ambulance trust. There are procedures in place for consumables replacement. This is a scheme that exceeds that currently in place in shopping centres and stations, where the same issues could arise. The manufacturer will warrant the AED equipment, as in the current BHF scheme. The scheme is supported by the BHF and almost all Ambulance Trusts.

**Do I need indemnity insurance for using one?**

No. The patient is to all intents and purposes 'dead' when you arrive. Using CPR with a PAD will hopefully bring them back to life. No one will complain about that! However, calling 999 and taking instructions from the ambulance service will automatically cover you anyway. Remember that you must call 999! A very good guide to this area is published on the website of the UKRC.