

Automated external defibrillators (AEDs)





We update this booklet regularly.
However, you may find more recent
information on our website at bhf.org.uk

Contents

Using an automated external defibrillator (AED)	4
Becoming a community responder	13
Other ways you can help	15
BHF regional contact details	17
Organisations and useful links	18
Government agency links	19
Voluntary societies	21
Other agencies and organisations	22
Ambulance services	23
Further reading and publications	28
AED Suppliers	28
Glossary	30
Acknowledgements	31

Using an automated external defibrillator (AED)

Q What is an AED for?

An AED is a machine that can restart the heart by giving an electric shock in some cases of cardiac arrest.

A cardiac arrest is when the heart stops pumping effectively and the person collapses. Many people who have had successful treatment with an AED can stay healthy for many years.

Q How does an AED work?

Before we explain how an AED works, you first need to understand what 'fibrillation' is.

Most people who die suddenly do so because they have a cardiac arrest. If the heart stops beating completely and no blood is being circulated, the person loses consciousness within seconds and dies. However, in most cases of cardiac arrest, the heart does not completely stop. For the first few minutes of a cardiac arrest, all the individual heart fibres contract in a chaotic way, called 'ventricular fibrillation'. This is because the heart is no longer producing the electrical impulses that usually make the heart beat in a normal, regular way. When the heart is in this state of ventricular fibrillation, the heart chambers are just quivering (fibrillating). They don't have any pumping action.

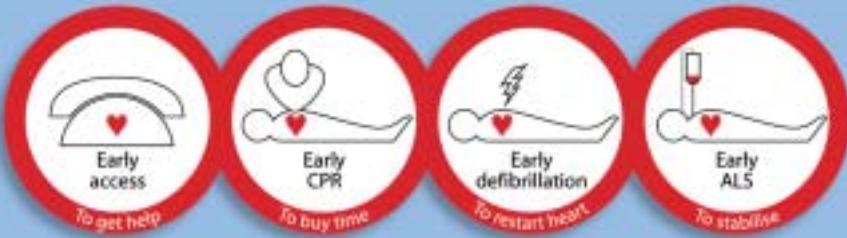
An AED gives an electric shock that makes all the heart fibres contract together. This is called 'defibrillation'. This restores the normal pumping action of the heart and gets the blood circulating again.



Q How quickly does an AED have to be used?

About half of all people who have a cardiac arrest can be resuscitated successfully, but only if defibrillation is given within about **four minutes** of the person collapsing.

Although defibrillation is unlikely to be successful after seven or eight minutes, giving CPR (chest compression and rescue breathing) will help to improve the person's chance of a positive outcome. As a result, a fast response is all important to **get help, buy time, defibrillate and make the patient stable.**

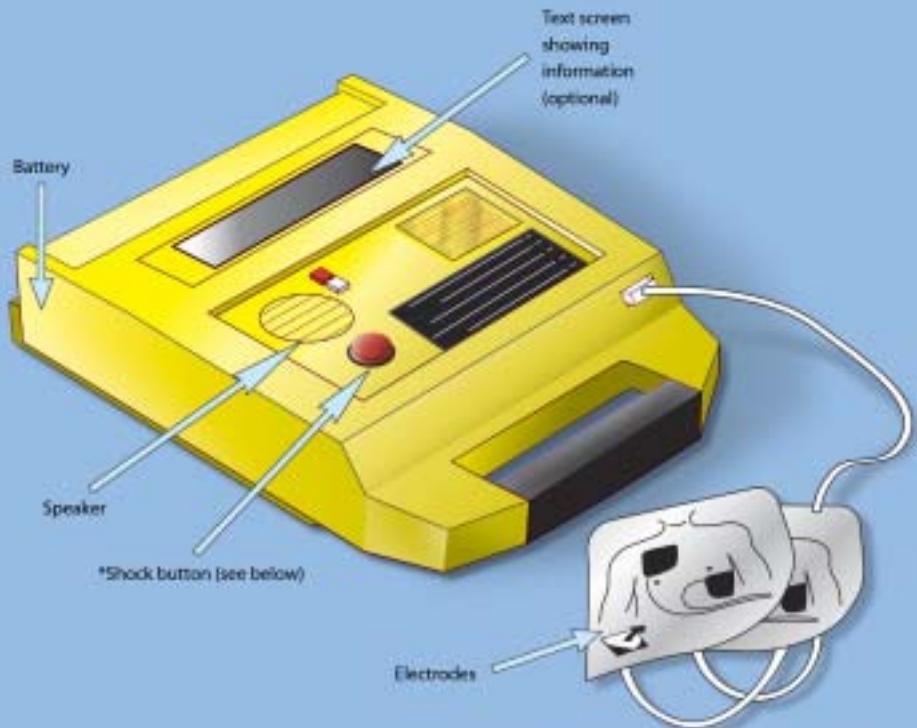


Q What does an AED look like?

An AED is a small box which weighs about 2 kilos (4.5 pounds). It has a compartment containing sticky pads (electrodes) which are put on the patient's chest. All the main buttons and switches are clearly marked.

All AEDs are easy to handle although model makes look different.

An example of what an AED looks like is shown below.



**Some AEDs deliver shocks without a 'button press' and so do not have a shock button.*

Q How do you use an AED?

It's very easy to use an AED. The rescuer turns the machine on (with some AEDs this is done just by opening the box). The AED then gives 'voice prompts' that guide the rescuer through the stages of using the machine. First, the rescuer puts the pads in position on the patient's chest. These pads detect electrical activity in the heart and recognise if there is ventricular fibrillation. The AED will tell you if a shock is needed and how to give the shock. With some models of AED, a shock is given automatically.

It tells the rescuer when to begin chest compression, and when to stop so that the machine can analyse the heart rhythm. It will then tell the rescuer if another shock needs to be given.



Q What happens after successful defibrillation?

Even if the defibrillation has been successful, the patient will usually still be unconscious for a while. The emergency services should arrive soon to take over, but the patient is likely to be unconscious until they do arrive.

Ventricular fibrillation does not necessarily mean that the heart is severely damaged. So someone who has had fibrillation still has a good chance of living for a long time.

Q Is defibrillation always successful if it is given in time?

Unfortunately not, because about half of all cases of cardiac arrest do not result from ventricular fibrillation.

Q Why is it called an 'automated external defibrillator (AED)'?

When AEDs were first invented, they were used 'internally' on the exposed heart – for example during heart surgery. 'External' means that the electric shock is applied through pads placed on the person's chest.

'Automated' means that the machine detects the electrical activity in the heart and gives automated instructions to the rescuer on what to do. 'Automatic' generally means the AED itself will give the shock when needed.

Q Do you need to have training on how to use an AED?

Most people should be able to use an AED without any formal training. This is because, once the AED is turned on, it gives clear voice instructions. However, there are many different types of AED so, to help give you confidence in using one, it is well worth having an instruction and practice session. These last about two to four hours. For training information please contact a voluntary society such as the British Red Cross, St John Ambulance or your local ambulance service.



For information about a free, two-hour course in emergency life support, turn to the back page of this booklet.

Q Can an AED do any harm?

AEDs are very safe – for both patients and rescuers. The AED will only give a shock when it ‘recognises’ the pattern of ventricular fibrillation. Using an AED is most unlikely to cause harm and may well save the patient’s life. Current plans are to place AEDs in the community where they are most needed (considering population numbers, the numbers of cardiac arrests and local ambulance response times).

Safety is also important for the rescuer. Nobody should be touching the patient when a shock is given, so a voice prompt tells the rescuer when to stand clear. Anyone who is touching the patient when the shock is given is likely to receive a jolt. This might be painful, but it is extremely unlikely to be dangerous. In all the huge number of times that AEDs have been used, we do not know of any rescuer who has suffered serious harm from using one.

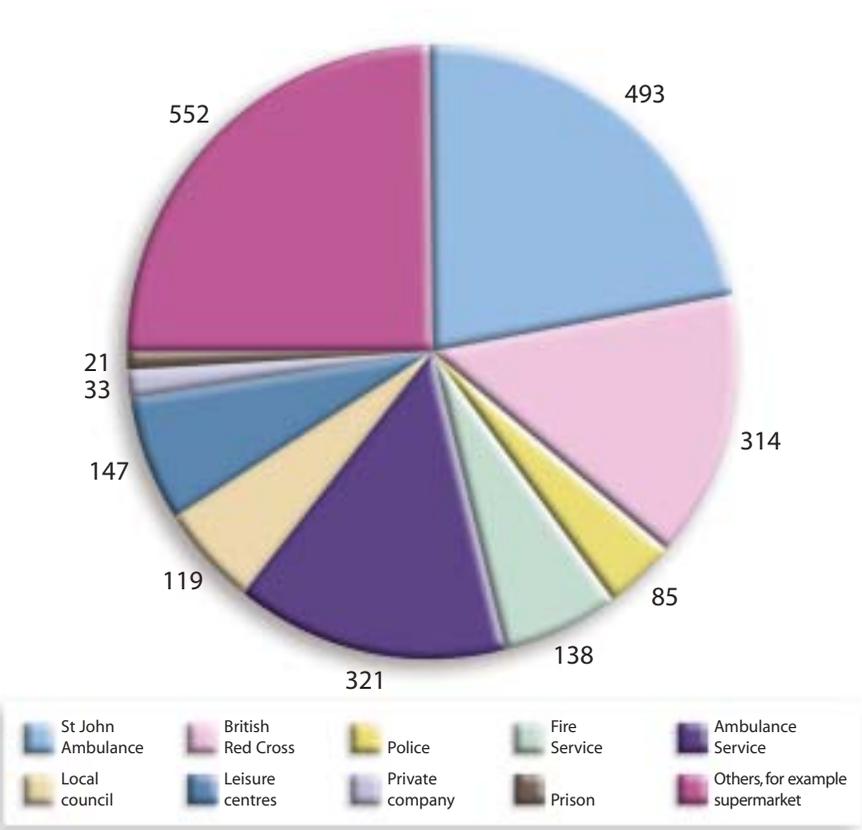
Q Where might I see an AED?

As well as the AEDs that are used by health professionals in hospitals, ambulances and health centres, we know of over 10,000 AEDs that are available for community use in the UK. The British Red Cross, St John Ambulance and the Royal Life Saving Society UK all have them. You can also find them in some police and fire stations, in airports, most major railway stations, some bus terminals and underground stations, as well as in leisure centres and in many community sites. The easiest place to see one may be at a station or airport where they are kept in special cabinets on view to the general public. Please do not take them out of the cabinet unless there is a real emergency (an alarm will go off if you do).



The British Heart Foundation, together with the Department of Health, the Resuscitation Council (UK) and the voluntary societies are very keen to have AEDs available in places where people often collapse or where large crowds gather.

Number of community responder AEDs by organisation (since 1996)



Becoming a community responder

Many more people who have a cardiac arrest could be resuscitated if defibrillation is given within four or five minutes of a collapse (or a little longer if prompt cardiopulmonary resuscitation has been given). Unfortunately, in many cases the emergency services are not able to reach the victim within that time. As a result, the NHS ambulance service is co-ordinating arrangements for AEDs to be put in places where it is difficult for an ambulance to reach within five minutes. These arrangements include having volunteers to work as community responders.

Q What does a community responder do?

A community responder is someone who can respond to a local emergency, has an AED and is trained in how to use it. They can use the AED if necessary, until the emergency services arrive.

A community responder needs to have initial training, which usually takes one day then refresher training about once every six months. They need to be available at certain times to respond to local emergencies and go to a few meetings a year. This work is voluntary, but training and expenses are paid for.



Q Can I become a community responder?

Your help will be very welcome and you will be linked to the local ambulance service often in association with the voluntary societies or other groups interested in basic life support and defibrillation.

If you are interested in becoming a community responder, contact the Community Defibrillation Officer (CDO), or the person responsible for community resuscitation issues at your local ambulance service. You will find contact details at the back of this leaflet.



You don't need to have any previous medical training. If your help is needed, you will get all the training you need.

Q Who pays for the AED?

There are a number of AED suppliers, but an average AED costs around £1,500. We do not expect you to pay for community AEDs, as several charities can help. For example, the British Heart Foundation has supported many local initiatives by making contributions towards the cost of the AED. However, this financial support is only given when the initiative has been fully linked to, and agreed with, the local ambulance service.

For details about all our initiatives visit our website at bhf.org.uk/defibs or use the contact lists provided at the end of this booklet.

Other ways you can help the BHF

If you are not able to become a community responder, you can still help by knowing more about community resuscitation in your area. It is speed of response that saves lives, and four minutes is a hard target to meet!

- you could consider doing a course in emergency life support (ELS), which includes cardiopulmonary resuscitation (CPR). See Heartstart UK, on the back cover
- become a volunteer for the British Heart Foundation to help raise funds for the equipment – please see our website at bhf.org.uk
- if you want to donate money to the British Heart Foundation to help our work in community resuscitation, please see the donation slip on the inside back cover or visit our website at bhf.org.uk



Q Can I buy an AED for home use?

You could use an AED at home, but we don't recommend this unless you have had professional advice. Most AEDs in the community are managed by people who have had training in basic life support and defibrillation such as members of the voluntary societies or people whose job might involve using an AED.

We strongly support the idea of placing AEDs in the community in carefully chosen places where they have the greatest chance to save lives. Because of this our priorities are to:

- encourage and provide opportunities for training the public in emergency life support skills, and
- give community responders AEDs intended to protect people at high risk.

We also recognise that some patients and their carers may have the approval of cardiologists or doctors to buy AEDs to use at home. We believe that, for the moment at least, we should base any national initiative on a careful appraisal of each person's circumstances and that it may be too soon to promote the strategy nationally.

Remember:

- when someone has a cardiac arrest, time is crucial
- learn how to provide emergency life support (see Heartstart UK on the back cover) and defibrillation. Learn how to respond to a cardiac arrest quickly and effectively
- know how to do your best for your family, friends, neighbours and community.

The British Heart Foundation is helping the community to help themselves.

BHF regional contact details

Head office

British Heart Foundation

14 Fitzhardinge Street

London W1H 6DH

Phone: 020 7935 0185

Fax: 020 7486 5820

Website: bhf.org.uk

If you want to find out more about supporting funding for defibrillators or get involved in our local fundraising efforts, please call the relevant BHF regional office below.

Regional offices

Northumberland,
Durham, Tyne and Wear,
Cleveland, Yorkshire
(not South), Cumbria
Phone: 01937 835 421
Email: region1@bhf.org.uk

Lancashire, Merseyside,
Cheshire, Greater
Manchester, Northern
Ireland, Isle of Man
Phone: 0151 236 6988
Email: region7@bhf.org.uk

Wiltshire, Somerset,
Dorset, Devon, Cornwall,
Isles of Scilly, South
Gloucestershire,
Guernsey and Jersey
Phone: 01225 463 616
Email: region10@bhf.org.uk

Norfolk, Suffolk,
Cambridgeshire,
Northamptonshire,
Hertfordshire,
Buckinghamshire,
Bedfordshire, Essex,
London (North of
the Thames)
Phone: 01763 242 414
Email: region2@bhf.org.uk

West Midlands,
Warwickshire,
Staffordshire, Shropshire,
Herefordshire,
Worcestershire,
Oxfordshire,
Gloucestershire
(but not South
Gloucestershire)
Phone: 0121 722 8350
Email: region8@bhf.org.uk

Scotland
Phone: 0131 555 5891
Email: scotland@bhf.org.uk

Leicestershire,
Derbyshire, Lincolnshire,
Nottinghamshire,
South Yorkshire
Phone: 01623 624 558
Email: region5@bhf.org.uk

Kent, Surrey, East and
West Sussex, Hampshire,
Berkshire, Isle of Wight,
London
(South of Thames)
Phone: 01892 890 002
Email: region9@bhf.org.uk

Wales
Phone: 029 2038 2368
Email: wales@bhf.org.uk

Organisations and useful links

If you want to find out more about community defibrillation activities across the UK, please use the following list of contacts.

The following information was correct in May 2005.

BHF

British Heart Foundation
Coronary Heart Disease Statistics
www.heartstats.org

Heartstart UK

Phone: 020 7487 7115/9419
Email: heartstart@bhf.org.uk
bhf.org.uk/hearthealth

Cardiac Equipment team

Phone: 0207 487 7167/9447
Email: equipment@bhf.org.uk

Publications

bhf.org.uk/publications

Donations

Phone: 020 7487 9404
bhf.org.uk/helping

Regional offices:

Volunteering and equipment funding enquiries

bhf.org.uk/helping
bhf.org.uk/defibs

Government agency links

National Defibrillator Programme Delivery Unit

Phone: 020 7972 4923

www.dh.gov.uk/healthtopics

National Assembly for Wales

Phone: 029 20 825111

www.wales.gov.uk

Scottish Executive

Phone: 0131 556 8400

www.scotland.gov.uk

Northern Ireland Executive

Phone: 028 9052 0700

www.nics.gov.uk

The Big Lottery Fund

General enquiries: Phone: 020 7 211 1916

www.biglotteryfund.org.uk

Department of Health Heart Team

www.doh.gov.uk/heart

Central Cardiac Audit Database

www.ccad.org.uk

CHD collaboratives

www.modern.nhs.uk/chd

Government agency links continued

Medicines and Healthcare Products Regulatory Agency

Phone: 020 7084 2000

www.mhra.gov.uk

Health and Safety Executive

Phone: 08701 545 500

www.hse.gov.uk

Office of National Statistics

Phone: 0845 601 3034

Minicom: 01633 812 399

(for the hearing impaired)

www.statistics.gov.uk

NHS Plan

Phone: 020 7210 4850

Minicom: 020 7210 5025

www.dh.gov.uk/publicationsandstatistics/publications

Our Healthier Nation

Phone: 020 7 061 3191

www.ohn.gov.uk

Fire Services Bill

www.parliament.the-stationery-office.co.uk

Voluntary societies

St John Ambulance

Phone: 0870 10 49 50

www.sja.org.uk

British Red Cross

Phone: 0870 170 7000

www.redcross.org.uk

The Royal Life Saving Society UK

Phone: 01789 773 994

www.lifesavers.org.uk

St Andrew's Ambulance Association

Phone: 0141 332 4031

www.firstaid.org.uk

Other agencies and organisations

Resuscitation Council (UK)

Phone: 0207 388 4678

www.resus.org.uk

The British Association for Immediate Care

Phone: 0870 1654 999

www.basics.org.uk

Myocardial Infarction National Audit Project

Phone: 020 7067 5800

www.nice.org.uk

British Cardiac Society

Phone: 020 7383 3887

www.bcs.com

Royal College of Physicians

Phone: 020 7935 1174

www.rcplondon.ac.uk

European Resuscitation Council

www.erc.edu

Health Professions Council

Phone: 020 7582 0866

www.hpc-uk.org

The British Paramedic Association (BPA)

Phone: 01332 746356

www.britishparamedic.org

The Northern Ireland Chest Heart and Stroke Association

Phone: 028 9032 0184

www.nichsa.com

Ambulance services

Ambulance Service Association

Phone: 020 7928 9620

www.asancep.org.uk

www.ambex.net

Ambulance services – England

Avon Ambulance Service NHS Trust

Phone: 0117 9277046

www.avonambulance.org.uk

Bedfordshire and Hertfordshire Ambulance
and Paramedic Service

Phone: 01234 408 999

www.bhamb.nhs.uk

Royal Berkshire Ambulance Service NHS Trust

Phone: 0118 936 5500

www.berkshire.nhs.uk

Cumbria Ambulance Service NHS Trust

Phone: 01228 596909

www.cas.nhs.uk

Dorset Ambulance Service NHS Trust

Phone: 01202 896111

East Anglian Ambulance Service NHS Trust

Phone: 01603 424255

www.eastanglianambulance.com

Ambulance services – England continued

East Midlands Ambulance Service NHS Trust

Phone: 0115 9296151

www.emas.nhs.uk

Essex Ambulance Service NHS Trust

Phone: 01245 443 344

www.essamb.co.uk

Gloucestershire Ambulance Service NHS Trust

Phone: 01452 753030

www.glosamb.org.uk

Hampshire Ambulance Service NHS Trust

Phone: 01962 892697

Hereford and Worcester Ambulance Service
NHS Trust

Phone: 01886 834200

Isle of Man Ambulance Service NHS Trust

Phone: 01624 642 154

Isle of Wight Healthcare NHS Trust

Phone: 01983 534111

Kent Ambulance Service NHS Trust

Phone: 01622 740372

Ambulance services – England continued

Lancashire Ambulance Service NHS Trust

Phone: 01772 903989

www.lancashireambulance.com

Lincolnshire Ambulance Service NHS Trust

Phone: 01522 545171

London Ambulance Service NHS Trust

Phone: 020 7921 5100

www.londonambulance.nhs.uk

Greater Manchester Ambulance Service NHS Trust

Phone: 0161 796 7222

Mersey Regional Ambulance Service
NHS Trust

Phone: 0151 2605220

www.merseyambulance.nhs.uk

North East Ambulance Service NHS Trust

Phone: 0191 273 1212

www.neambulance.nhs.uk

Oxfordshire Ambulance Service NHS Trust

Phone: 01865 740100

Ambulance services – England continued

South Yorkshire Ambulance Service

NHS Trust

Phone: 01709 820 520

www.syas.nhs.uk

Shropshire Ambulance Service NHS Trust

Phone: 01743 273600

www.shropshireambulance.nhs.uk

Surrey Ambulance Service NHS Trust

Phone: 01737 353333

www.surrey-ambulance.nhs.uk

Sussex Ambulance Service NHS Trust

Phone: 01273 489444

www.sussamb.co.uk

Staffordshire Ambulance Service NHS Trust

Phone: 01785 253521

www.staffsamb.nhs.uk

Tees, East and North Yorkshire Ambulance Service

NHS Trust

Phone: 01904 666000

www.tenyas.org.uk

Two Shires Ambulance Service NHS Trust

Phone: 01908 262422

Ambulance services – England continued

Coventry and Warwickshire Ambulance Service
NHS Trust

Phone: 01926 881331

Westcountry Ambulance Service NHS Trust

Phone: 01392 261500

www.was.co.uk

West Midlands Ambulance Service

NHS Trust (Amalgamated with Shropshire)

Phone: 01384 215555

www.wmas.nhs.uk

West Yorkshire Ambulance Service

NHS Trust

Phone: 01924 582000

www.wymas.co.uk

Wiltshire Ambulance Service NHS Trust

Phone: 01249 443939

Ambulance services – Northern Ireland

Northern Ireland Ambulance Service

Phone: 028 9040 0999

www.niamb.co.uk

Ambulance services – Scotland

Scottish Ambulance Service
Phone: 0131 446 7000
www.scottishambulance.com

Ambulance services – Wales

Welsh Ambulance Service
Phone: 01745 532900
www.wales.nhs.uk

Further reading and publications

Resuscitation Journal
www.elsevier.com

AED suppliers

Amazon Medical Limited
Phone: 0161 776 4336
www.amazonmedical.co.uk

Beaver Medical Products
Phone: 01604 499427
www.beavermedical.com

Cardiac Services Limited
Phone: 01625 878999
www.cardiac-services.com

AED suppliers continued

Cardiac Science Corporation

Phone: 0161 9260000

www.cardiacscience.com

Laerdal Medical

Phone: 01689 876634

www.laerdal.co.uk

Medtronic Ltd

Phone: 01923 212213

www.medtronic.co.uk

Numed Cardiac Diagnostics

Phone: 0114 243 3896

www.numed.co.uk

Response Medical Equipment

Phone: 01386 841926

www.response-medical.co.uk

Zoll Medical UK Ltd

Phone: 01925 846 400

www.zoll.com

Glossary

Basic life support (BLS): Actions to maintain breathing and circulation without using equipment. Includes assessing a casualty, maintaining an airway and cardiopulmonary resuscitation (CPR), as well as dealing with choking.

Emergency life support (ELS): Similar to BLS and includes dealing with serious bleeding.

Cardiopulmonary resuscitation (CPR): A technique aimed at maintaining circulation in cardiac arrest until defibrillation is available. It includes performing chest compression and rescue breathing. CPR buys time, and if started straightaway can save many lives.

Ventricular fibrillation: The most common cause of cardiac arrest in people who suffer unexpected cardiac arrest. The heart is still active during ventricular fibrillation but is working in an un-coordinated way that makes it quiver instead of pumping.

Cardiac arrest: A condition in which the heart is not pumping or is not pumping effectively. Without circulation of blood pumped by the heart, a person will collapse within seconds and will die unless the condition is treated promptly.

Community Defibrillation Officer (CDO): A post for an individual who has the responsibility for co-ordinating local community resuscitation activities.

Community responder: Usually (but not just) a person who makes him or herself available to offer urgent help at life-threatening emergencies.

Defibrillator: A device that delivers a controlled electric shock to the heart, to restore a normal heartbeat in the most common form of cardiac arrest (called ventricular fibrillation).

Automated External Defibrillator (AED): A defibrillator that delivers the shock through sticky pads attached to the chest. These defibrillators are programmed to know if and when a shock should be delivered, and give simple instructions to the rescuer who needs training to use one effectively. They are very safe both for the person who has collapsed and the rescuer.

Public access defibrillation (PAD): The availability of automated external defibrillators (AEDs) that have been made available to members of a local workforce or site or members of the public (or combination).

Acknowledgements

The British Heart Foundation would like to thank our Emergency Life Support and Defibrillation Committee who arranged for this publication to be produced. A special note of thanks to our Chair, Professor Douglas Chamberlain and Dr Mick Colqhoun who contributed much of their time to this project.

AED leaflet – feedback questionnaire

Your comments are appreciated and can help us produce an improved booklet. Please fill in this form and send it to:

Emergency Life Support Department

14 Fitzhardinge Steet
London
W1H 6DH.

1 How did you get this booklet?

2 Are you a health professional? Yes No

3 Did this booklet help you understand more about defibrillators and their use? Yes No

In what ways?

4 Was the booklet easy to read? Yes No

5 Did you find any parts of the booklet difficult to understand? Yes No

Are there any issues not covered?

6 What suggestions would you like to make?

Your Personal Information

The British Heart Foundation (BHF) will use your personal information for administration purposes and to provide you with services, products and any information that you have asked for.

- S** We greatly value your support and would like to keep you informed about our work through marketing literature in order to help further our charitable aims. We may contact you by phone or post for this purpose. Please tick the box if you would prefer **not** to hear from the BHF in this way.
- MP02** We may want to share information with other organisations that are in partnership with the BHF and who support our aims and objectives. Please tick the box if you would prefer us **not** to share your details.
- MP07** Please tick this box if you **would like to** receive email communications about the future activities of the BHF, via the email address you have provided.

We would very much like to keep you up to date with all our initiatives in community resuscitation. If you want to receive regular updates please give your name, address and email below

Name: _____

Address: _____

Email: _____

I want to make a regular gift of: £3 £5 Other £
 each month by direct debit on the 1st or 15th of the month (delete as appropriate)

Instruction to your Bank or Building Society to pay by Direct Debit



Please fill in this form and send it to: The British Heart Foundation, FREEPOST (SCE15108), Witney OX28 4ZB

Name and full postal address of your Bank or Building Society Originator's Identification Number

To: The Manager Bank/Building Society Address _____ _____ _____ Postcode _____	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">4</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">1</td> </tr> </table>	4	1	2	5	2	1
4	1	2	5	2	1		

Reference – for office use only

--

Instruction to your Bank or Building Society
 Please pay the British Heart Foundation Direct Debits from the account detailed in this instruction subject to the safeguards assured by the Direct Debit Guarantee. I understand that this instruction may remain with the British Heart Foundation and, if so, details will be passed electronically to my Bank/Building Society.

Name(s) of Account Holder(s) _____ _____	Signature(s) _____ _____											
Branch Sort Code <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> </tr> </table>								Date _____ _____				
Bank/Building Society account number <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> </tr> </table>												

Banks and Building Societies may not accept Direct Debit instructions for some types of account.

Please tick if you would like us to send you a Gift Aid form to make your donation work harder at no extra cost to you.



British Heart Foundation

14 Fitzhardinge Street

London W1H 6DH

Phone: 020 7935 0185

Fax: 020 7487 5820

Website: bhf.org.uk

Heartstart UK

For information about a free two-hour course in emergency life support, contact Heartstart UK at the British Heart Foundation.

The course teaches you to:

- recognise the warning signs of a heart attack
- help someone who is choking or bleeding
- deal with someone who is unconscious
- know what to do if someone collapses, and
- perform cardiopulmonary resuscitation (CPR).

Email: heartstart@bhf.org.uk **Website:** bhf.org.uk/hearthealth

Heart Information Line:

08450 70 80 70 *(a local-rate number)*

An information service for the public and health professionals on issues relating to heart health.

