



# European Resuscitation Council Guidelines 2000 for Automated External Defibrillation

A statement from the Basic Life Support and Automated External Defibrillation Working Group<sup>1</sup> and approved by the Executive Committee of the European Resuscitation Council

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## 1. Introduction

The European Resuscitation Council (ERC) issued guidelines for the use of Automated External Defibrillators (AEDs) in 1998 [1]. The American Heart Association (AHA), together with representatives of the International Liaison Committee on Resuscitation (ILCOR) then undertook a series of evidence based evaluations of the science of resuscitation [2] which culminated in the publication of Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care in August 2000 [3,4]. The Basic Life Support and Automated External Defibrillation Working Group (BLS and AED Working Group of the ERC) has considered this document and the supporting scientific literature and has recommended changes to the ERC AED guidelines. These are presented in this paper.

## 2. Guidelines changes

Some of the changes reflect changes in BLS procedure during the AED protocol. Other

changes have been made to achieve international uniformity.

The major changes in technique are as follows:

(a) Delivery of basic life support has been revised to accord with the new ERC BLS guidelines. There are two important changes.

(i) Immediately after identifying absence of normal breathing two initial rescue breaths are delivered. In the 1998 guidelines it was stated that the initial breaths could be omitted when a defibrillator was immediately available. This has been changed to achieve uniformity between the BLS and the AED protocols which should aid skill retention. Moreover, the delivery of the two initial breaths is an essential part of the assessment of signs of a circulation (see below).

(ii) The carotid pulse check is no longer included in the protocol for lay rescuers. The reason for this change is that several studies have shown that well in excess of 10 s is required for the diagnosis of the presence or absence of a carotid pulse [5–9] and even with prolonged palpation significant errors in diagnosis occur [10]. Lay rescuers will now ‘look for signs of a circulation’ meaning look, listen and feel for normal breathing, coughing or movement for no more than 10 s. For the initial assessment, this is performed after delivery of two rescue breaths. If the rescuer is not confident that one or more of these signs of a circulation are present he or she should begin chest compressions immediately and continue with the AED protocol.

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Healthcare providers should continue to perform a carotid pulse check in addition to checking the other signs of a circulation; they should take no more than 10 s to do this.

A potential problem with omission of the pulse check is that return of a spontaneous circulation may go undetected if the victim does not make any movement or start breathing. In these circumstances, the lay rescuer will continue to deliver chest compressions. Undesirable as this may be, the evidence that lay rescuers are unable to determine the presence or absence of a carotid pulse reliably suggests that this would happen even if a pulse check was included. When healthcare providers arrive they will feel for a pulse and confirm the presence of a circulation.

(b) When no shock is indicated, or immediately after a series of three shocks, CPR should be given for 1 min. In the 1998 ERC guidelines the duration of CPR was 3 min after 'no shock indicated', except when the message followed a successful defibrillation, when it was 1 min [1]. Although the 1998 guidelines were developed for optimal delivery of CPR in case of non-shockable rhythms, the new guidelines achieve uniformity between AED protocols. It is hoped that this simplification will result in better acquisition and retention of skills.

The international guidelines AED algorithm recommends a circulation check after the completion of each minute of CPR, followed by manual activation of the analysis sequence [3,4]. Many AEDs do not have an analysis button and will initiate each analysis automatically. Therefore this additional check for signs of a circulation is omitted from the current ERC guidelines.

(c) If the AED protocol is to be used by advanced life support (ALS) providers, adrenaline/epinephrine should be administered every 2–3 min, not during each cycle of CPR, which lasts only 1 min.

### 3. Sequence of actions

The following is the agreed sequence of actions that constitute the ERC Guidelines 2000 for AED. The algorithm is intended for the resuscitation of persons aged 8 years or over. The algorithm assumes that only one rescuer is present. If more than one rescuer is present, tasks should be assigned. Activation of the EMS system and immediate

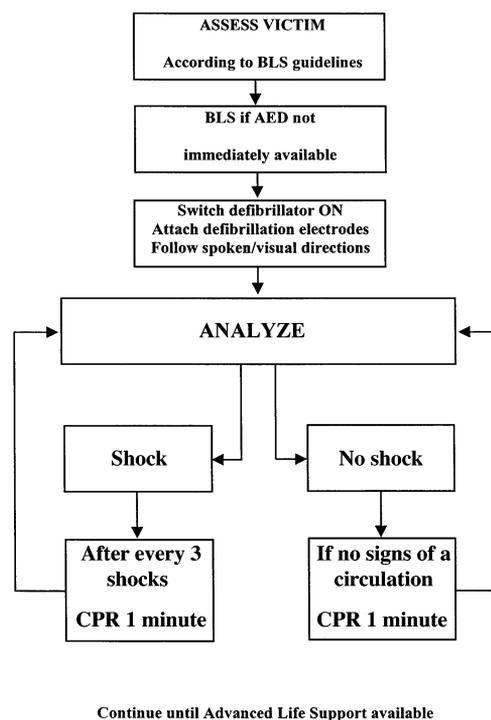


Fig. 1. Automated external defibrillation.

availability of an AED have priority. In the text, use of the masculine includes the feminine (Fig. 1).

#### 1. Assess victim

- Check response: gently shake his shoulders and ask loudly 'Are you all right?'
- Open airway; tilt head and lift chin. Check for breathing
- Assuming he is not breathing, activate EMS and if not already obtain AED
- Give two effective breaths
- Check for signs of a circulation:
  - for lay rescuers this means look, listen and feel for normal breathing, coughing, or movement by the victim. Take no more than 10 s to do this.
  - for health care providers this will also include checking the carotid pulse.

#### 2A. If signs of a circulation are present

- If breathing present put victim into recovery position
- If no breathing, start rescue breathing and re-check for signs of a circulation every minute

#### 2B. If no signs of a circulation

- Switch on AED
- Attach electrodes
- Follow spoken/visual instructions

Ensure that nobody touches the victim whilst the AED is analysing the rhythm.

### **3A. If a shock is indicated**

- Ensure that everybody is clear of the victim
- Push shock button as directed
- Repeat 'analyse' or 'shock' as directed

If at any time a 'no shock indicated' condition is present: see 3B

Do not check for signs of a circulation between the first three shocks

- After three shocks check for signs of a circulation

If no signs of a circulation present

- Perform CPR for 1 min

There should be no voice prompts during this time. CPR will be timed by the AED timer.

- After 1 min stop CPR to allow rhythm analysis
- Continue the AED algorithm as directed by voice and visual prompts

If signs of a circulation ARE present

- If breathing is present, put victim into recovery position
- If no breathing, start rescue breathing and re-check for signs of a circulation every minute

### **3B. If no shock indicated**

- Look for signs of a circulation
- If no signs of a circulation present, perform CPR for 1 min

There should be no voice prompts during this time. CPR will be timed by the AED timer.

- After 1 min stop CPR to allow rhythm analysis
- Continue the AED algorithm as directed by voice and visual prompts

### **4. Continue to follow AED instructions until ALS is available**

## **References**

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