

Guidelines for basic life support

European Resuscitation Council Basic Life Support Working Group

A basic life support working group of the European Resuscitation Council was set up in 1991. It was given the objective of producing agreed standards of basic life support to ensure uniform teaching of the techniques to health care professionals and lay people throughout Europe. A common complaint in the past, particularly from members of the public who have received instruction in basic life support, is that different organisations teach different techniques. This problem exists within countries as well as among countries. The European Resuscitation Council presents below its basic life support guidelines, which it hopes will be detailed enough to avoid any ambiguities and to be acceptable for use in all the countries represented by the council.

The term basic life support refers to maintaining an airway and supporting breathing and the circulation without using equipment other than a simple airway device or protective shield. Survival from cardiac arrest is greatest when the event is witnessed; when a bystander starts resuscitation; when the heart arrests in ventricular fibrillation; and when defibrillation is carried out at an early stage.

Sequence of resuscitation

The flow chart (fig 1) sets out an action plan for the initial assessment and management of an apparently lifeless casualty. Underlying the sequence is an emphasis on the importance of obtaining help early during a resuscitation attempt, particularly for a casualty with absent pulse.

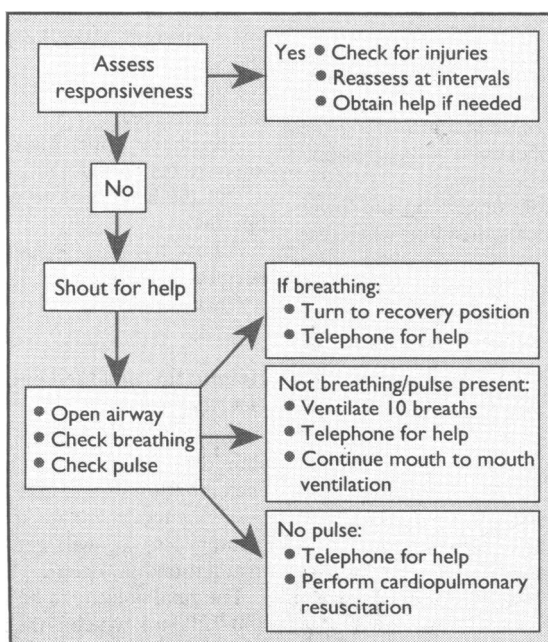


FIG 1—Flow chart showing action plan for initial assessment and management of an apparently lifeless casualty

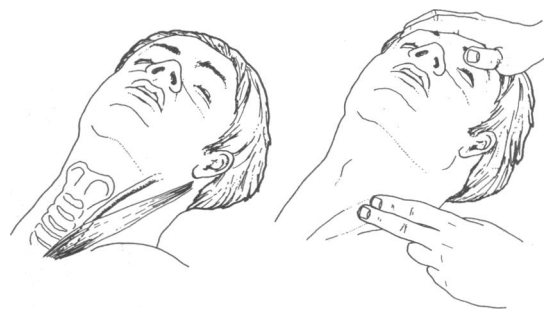


FIG 2—Feeling for the carotid pulse

ASSESSMENT

Check whether casualty is responsive

Gently shake the casualty's shoulders and say loudly: "Are you all right?"

Procedure when casualty responds by answering or moving

Leave the casualty in the position in which you find him or her (provided s/he is not in further danger) and check for any injury.

Reassess responsiveness at intervals and obtain help if needed.

Procedure when casualty is unresponsive

Shout for help.

Open airway—

Loosen tight clothing around the casualty's neck

Remove any obvious obstruction from the mouth, including loose dentures, but leave well fitting dentures in place

If possible with the casualty in the position in which you find him or her place your hand along the hairline, exerting pressure to tilt the head. Keep thumb and index finger free to close the nose if expired air ventilation is required

With two fingertips under the point of the chin, lift the chin; this will often allow breathing to restart.

Look, listen, and feel for breathing—

Look for chest movements

Listen at the mouth for breath sounds

Feel for air with your cheek.

Look, listen, and feel for five seconds before deciding that breathing is absent.

Check for a pulse. The best pulse to feel in an emergency is the carotid (fig 2). Feel for five seconds before deciding it is absent.

ACTION

Procedure when casualty is breathing

Turn the casualty to the recovery position (see below) unless this would aggravate an injury.

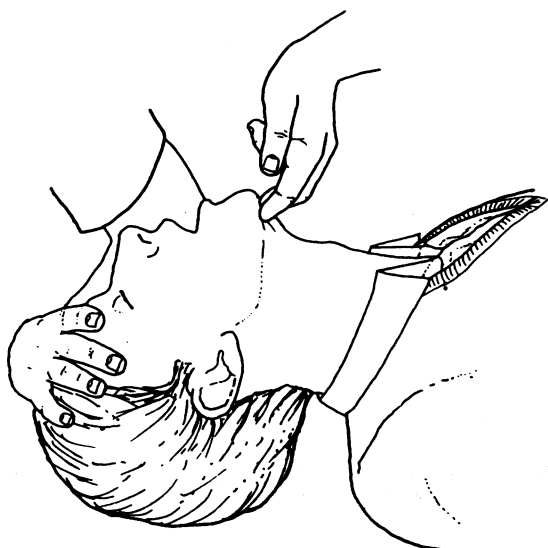
Go or telephone for help.

Return and keep the casualty under close observation, checking that he or she is breathing freely.

European Resuscitation Council Basic Life Support Working Group
Members of the working group are listed at the end of this report

Correspondence to:
Dr A J Handley, Colchester General Hospital, Colchester, Essex CO4 5JL.

FIG 3—"Head tilt and chin lift"—tilting casualty's head and lifting chin



Procedure when casualty is not breathing but a pulse is present

Turn casualty on to his or her back if necessary.
Give 10 breaths of expired air ventilation—

Ensure that the casualty's head is tilted and chin is lifted (fig 3)

Pinch the soft part of the casualty's nose closed with index finger and thumb

Allow the casualty's mouth to open a little but maintain the chin lift

Take a full breath and place your lips around the casualty's mouth, making sure you have a good seal

Blow steadily into the casualty's mouth, watching for the chest to rise. Take about two seconds for the full inflation

Maintaining "head tilt and chin lift," take your mouth away from the casualty and allow the chest to fall fully as the air comes out

Take another full breath and repeat the sequence as above to give 10 inflations in all. This should take about one minute.

Go or telephone for help.

Return to the casualty and reassess consciousness, breathing, and pulse as above.

If a pulse is present continue ventilation alone but recheck pulse after every 10 breaths, instituting full cardiopulmonary resuscitation if pulse disappears.

Procedure when pulse is absent

Go or telephone for help.

Return and turn the casualty on to his or her back. Ensure that the casualty is on a firm, flat surface.

Open the airway by tilting the head and lifting the chin (fig 3). Give two breaths of expired air ventilation.

Start chest compression—

Run your index and middle fingers up the lower margin of the rib cage and locate the point where the ribs join

With your middle finger at this point, place your index finger on the bony sternum above

Slide the heel of your other hand down the

sternum until it reaches your index finger. This should be the middle of the lower half of the sternum

Place the heel of your first hand on top of the other hand and interlock the fingers of both hands to ensure that pressure is not applied over the ribs

Lean well over the casualty and, with your arms straight, press down vertically on the sternum to depress it roughly 4-5 cm

Release the pressure, then repeat at a rate of about 80 compressions a minute.

Combine ventilation and compression—

After 15 compressions tilt the head, lift the chin, and give two inflations

Return your hands immediately to the sternum and give 15 further compressions

Continue compressions and ventilations in a ratio of 15:2.

Recovery position

An unconscious casualty whose airway is clear and who is breathing spontaneously should be turned to the recovery position (fig 4). This prevents the tongue falling back to obstruct the airway and reduces the risk of inhaling gastric contents.

Objectives in positioning casualty

The procedure should minimise movement of the casualty.

The casualty's head, neck, and trunk should be kept in a straight line.

The position should permit gravity drainage of material from the mouth.

The position should be stable, so that the casualty does not fall or topple into any other position.

The position should be suitable for a casualty being carried on a stretcher.

Recommended procedure

Remove the casualty's spectacles and bulky objects from pockets.

Kneel beside the casualty and make sure that both legs are straight.

Open the airway by tilting the head and lifting the chin.

Take the arm nearest to you and place it at right angles to the body, elbow bent, and with the palm uppermost.

Bring the far arm across the chest.

With your other hand grasp the far leg just above the knee and pull it up, keeping the foot on the ground (fig 5).

Pull on the leg to roll the casualty towards you on to his or her side.

Adjust the upper leg so that both the hip and the knee are bent at right angles.

Tilt the head back to make sure the airway remains open.

Adjust the hand under the cheek, if necessary, to keep the head tilted (fig 4).

Check breathing and pulse regularly.

Helpful tips and further information

VENTILATION

Only a small amount of resistance to breathing should be felt during mouth to mouth ventilation and each inflation should take about two seconds.

If you try to inflate too quickly resistance will be greater, less air will get into the lungs, and gastric insufflation may occur.

The tidal volume to be achieved in an adult is about 800-1200 ml, which is the amount normally required to produce visible lifting of the chest.

Wait for the chest to fall fully during expiration

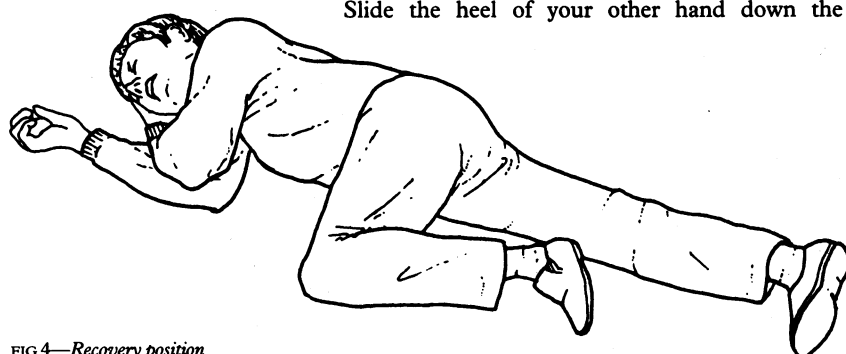


FIG 4—Recovery position

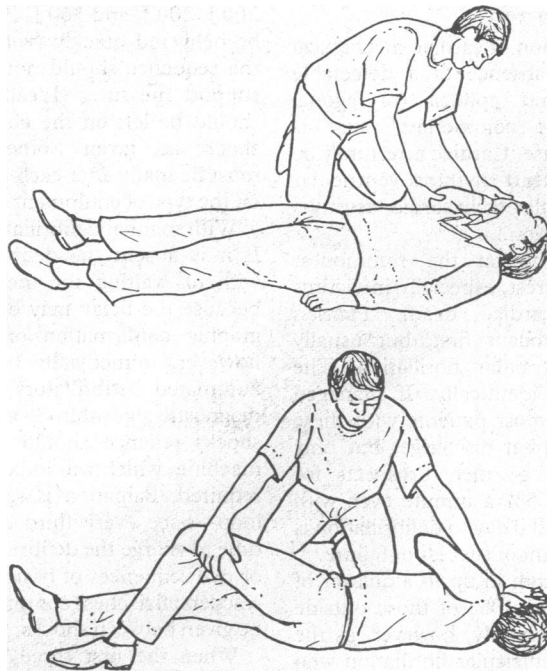


FIG 5—Method of turning casualty to recovery position

before giving another inflation. This should normally take two to four seconds. Each sequence of 10 breaths will therefore take about 40 to 60 seconds.

The exact timing of expiration is not critical; wait for the chest to fall, then give another inflation.

CHEST COMPRESSION

There is no evidence that an initial precordial (chest) thump improves survival in an unwitnessed cardiac arrest. On the other hand, a witnessed or monitored cardiac arrest may successfully be terminated by a thump, and a thump is recommended as part of the advanced life support protocol.¹

There is no convincing evidence that success of cardiopulmonary resuscitation is influenced by the rate of chest compressions within the range 60-100/min.

Accordingly, compressions should be given at a target (mean) rate of 80/min. For assessment, however, a range of 60-100 compressions/min would be acceptable. This is the rate or speed at which compressions should be undertaken, not the absolute number of compressions delivered within a given minute.

It is essential to combine ventilation with chest compression in order that the blood, which is being artificially circulated, contains enough oxygen.

In an unconscious adult the rescuer should aim to press down some 4-5 cm and apply only enough pressure to achieve this.

At all times the pressure should be firm, controlled, and applied vertically. Erratic or violent action is dangerous.

Try to spend about the same time in the compressed phase as in the released phase.

As the chances are remote that effective spontaneous cardiac action will be restored by cardiopulmonary resuscitation without other techniques of advanced life support (including defibrillation),¹ time should not be wasted by further checks for a pulse. If, however, the casualty makes a movement or takes a spontaneous breath check the carotid pulse to see whether the heart is beating; take no more than five seconds. Otherwise *do not interrupt* resuscitation.

Much of the content of this article has been published in *Resuscitation*.²

Members of the working group were: Stig Holmberg (Sweden; chairman), Anthony Handley (England; secretary), Jan Bahr (Germany), Peter Baskett (England), Leo Bossaert (Belgium), Douglas Chamberlain (England), Wolfgang Dick (Germany), Ank van Drenth (Netherlands), Lars Ekstrom (Sweden), Rudolf Juchem (Germany), Dietrich Kettler (Germany), Andrew Marsden (Scotland), Oliver Moeschler (Switzerland), Koen Monsieurs (Belgium), Paul Petit (France), Hribar Primoz (Bosnia), Jurgen Schuttler (Germany).

1 European Resuscitation Council Working Party. Adult advanced cardiac life support: the European Resuscitation Council guidelines 1992 (abridged). *BMJ* 1993;306:1589-93.

2 Basic Life Support Working Party of the European Resuscitation Council. Guidelines for basic life support. *Resuscitation* 1992;24:103-10.

Adult advanced cardiac life support: the European Resuscitation Council guidelines 1992 (abridged)

European Resuscitation Council Working Party

The European Resuscitation Council, established in 1990, is committed to saving lives by improving standards of cardiopulmonary resuscitation across Europe and coordinating the activities of interested organisations and individuals. In this regard the council has successfully brought together physicians and surgeons from eastern and western Europe and, in addition, has established relations with the American Heart Association and equivalent organisations in Canada, Australia, and South Africa. A main objective of the European Resuscitation Council is to produce guidelines for cardiopulmonary and cerebral resuscitation, and in this paper members of a working party of 14 experts from 11 countries set out an abridged version of the council's guidelines for adult advanced cardiac life support. The council hopes that the guidelines and accompanying algorithms will serve as a ready use "how to do it" for ordinary practitioners and paramedics inside and outside hospital.

The European Resuscitation Council presented guidelines for adult basic and advanced cardiac life

support at its first scientific congress in 1992. Three principles were held to be important in the production of the guidelines. The first was a willingness to review comprehensively the evidence justifying existing recommendations. The second was an emphasis on minimising delay in delivering defibrillating shocks to the victims of ventricular fibrillation. The third was the need for simplicity in treatment algorithms. In addition, the guidelines were to be appropriate for semiautomated or automated defibrillators and for use both in hospital and in pre-hospital settings.

Draft guidelines were submitted for comment to representatives of national societies with affiliation to the European Resuscitation Council. After appropriate modifications they were approved by the executive committee of the council. The guidelines have been published in preliminary form,^{1,2} together with papers summarising the scientific evidence on which they were based.³⁻¹² This paper sets out an abridged version of the guidelines for adult advanced cardiac life support aimed at promoting their implementation. Abridged and complete versions will also be published in other European journals.

European Resuscitation Council

Members of the working party are listed at the end of this report.

Correspondence to:
Dr Douglas Chamberlain,
Royal Sussex County
Hospital, Brighton
BN2 5BE.

BMJ 1993;306:1589-93