

Educational material for the First aid class prepared by the Medical Education Center JFMED based on ERC guidelines

CPR – Basic life support instructions

1. Make sure you, the victim and any bystanders are safe.
2. Check the victim for a response: gently shake his shoulders and ask loudly: “Are you all right?” **Do not use painful stimulation** according to the new guideline
3. If he responds
 - a. leave him in the position in which you found him provided there is no further danger
 - b. try to find out what is wrong with him and get help if needed
 - c. reassess him regularly

Basic life support in adults by ERC

4. **If he does not respond**
 - a. Shout for help
 - b. Turn the victim onto his back and then open the airway. The most common cause of airway obstruction is that the tongue falls backwards and obstructs the airway. Tongue is anatomically connected to the jaw its position is dependent on the tension of masseter muscle. If one is conscious or even asleep, the airway is patent. If the patient is unconscious, muscle tension decreases, the lower jaw collapses and the tongue may obstruct the airway. The simplest manoeuvre to open the airway is an application of head tilt and chin lift. place your hand on his forehead and gently tilt his head back, keeping your thumb and index finger free to close his nose if rescue breathing is required, or with your fingertips under the point of the victim’s chin, lift the chin to open the airway

5. Breathing

Keeping the airway open, look, listen and feel for normal breathing.

- a. Look for chest movement.
- b. Listen at the victim’s mouth for breath sounds.
- c. Feel for air on your cheek.

In the first few minutes after cardiac arrest, a victim may be barely breathing, or taking infrequent noisy gasps. Important: do not confuse this with normal breathing! Look, listen, and feel for no more than 10 s to determine whether the victim is breathing normally. If you have any doubt whether breathing is normal, act as if it is not normal.

6. If he is breathing normally

- a. turn him into the recovery position
- b. send or go for help/call for an ambulance
- c. check for continued breathing

If he is not breathing normally, suppose cardiac arrest. Pulsation on large vessels is not checked routinely, finding that the patient's breathing is not effective should be sufficient.

7. Send someone for help or, if you are on your own, leave the victim and alert the ambulance service (in the Slovakia 155 or less conveniently 112). Switch the phone to a loud mode, if possible. Let bring a defibrillator (AED) according to dispatcher advice.

Return and start chest compression as follows:

- a. kneel by the side of the victim
- b. place the heel of one hand in the centre of the victim's chest
- c. place the heel of your other hand on top of the first hand
- d. interlock the fingers of your hands and ensure that pressure is not applied over the victim's ribs. Do not apply any pressure over the upper abdomen or the bottom end of the bony sternum (breastbone)
- e. position yourself vertically above the victim's chest and, with your arms straight, between your hands and the sternum; press down hard only the sternum 5 – 6 cm. For adults receiving chest compressions, rescuers should place their hands on the lower half of the sternum (place the heel of one hand in the centre of the chest with the other hand on top). This should limit the risk of artificial rib fractures.

After each compression, release all the pressure on the chest without losing contact. During the relaxation phase, both heart and lungs are perfused. After each compression, all the pressure on the sternum should be released. Even low pressure applied on the sternum during the relaxation phase decreases the efficacy of chest compressions.

Repeat at a rate at least 100/min, maximum 120/min e.g. nearly 2 compressions per second. These manoeuvres are able to maintain artificially the circulation mainly to the heart, lungs and brain. It is vitally important that chest compressions must be performed quickly, and without unnecessary interruptions. Compression and release should take equal amounts of time.

8. Combine chest compression with rescue breaths. After 30 compressions open the airway again using head tilt and chin lift. During cardiac arrest is necessary to combine chest compressions with rescue breaths. Generally, one can perform two types of artificial breathing – 'mouth-to-mouth' or 'mouth-to-nose'.

a. **Mouth to mouth ventilation**

- I. Pinch the soft part of the nose closed, using the index finger and thumb of your hand on the forehead.
- II. Allow the mouth to open, but maintain chin lift.
- III. Take a normal breath and place your lips around his the mouth, making sure that you have a good seal.
- IV. Blow steadily into the mouth while watching for the chest to rise, taking about 1 s as in normal breathing; this is an effective rescue breath. The volume is approximately 500-600 mL (this is normal single breath volume at rest). Slight resistance is felt while the patient's lungs are inflated.
- V. Maintaining head tilt and chin lift, take your mouth away from the victim and watch for the chest to fall as air passes out
- VI. Take another normal breath and blow into the victim's mouth once more, to achieve a total of two effective rescue breaths. Then return your hands without delay to the correct position on the sternum and give a further 30 chest compressions.

b. **Mouth to nose ventilation**

- VII. The lips of rescuer are placed around victim's nose and his mouth is closed with the thumb of rescuer's hand which is placed on his chin. One should take his mouth away during expiration phase and open the mouth of the patient. His chest falls down automatically and expiration is done.
- VIII. Take another normal breath and blow into the victim's nose once more, to achieve a total of two effective rescue breaths. Then return your hands without delay to the correct position on the sternum and give a further 30 chest compressions

9. Continue with chest compressions and rescue breaths in a ratio of 30:2.

Stop to recheck the victim only if he starts breathing normally; otherwise do not interrupt resuscitation.

If your initial rescue breath does not make the chest rise as in normal breathing, then before your next attempt:

- a. check the victim's mouth and remove any obstruction
- b. recheck that there is adequate head tilt and chin lift

Do not attempt more than two breaths each time before returning to chest compressions.

Chest-compression-only CPR may be used as follows

- a. If you are not able or are unwilling to give rescue breaths, give chest compressions only.
- b. If chest compressions only are given, these should be continuous, at a rate of 100 min⁻¹.

10. After AED is available, follow AED voice prompts.

11. Continue resuscitation until

- a. qualified help arrives and takes over
- b. the victim starts breathing normally
- c. you become exhausted

12. 2. stop rechecking the victim only if he begins to breathe normally; otherwise, do not interrupt resuscitation.

13. If there is more than one rescuer present, another should take over CPR every 1—2 min to prevent fatigue. Ensure the minimum of delay during the changeover of rescuers. The recovering rescuer may maintain in the meantime the airway of the victim patent during chest compressions.

The use of Resuscitation Face Shield

Resuscitation face shield

Resuscitation face shield is a simple device used for artificial breathing to prevent transmission of infection from the victim and to eliminate reluctance to perform mouth-to mouth ventilation. Air-proof polyethylene membrane and one-way valve reduce both aversion and risk of cross infection. Shield is placed easily on the face of victim and artificial breathing may be performed. Pressure on the shield must be released during the expiration phase.

The use of Automated External Defibrillator (AED)

Automated external defibrillator (AED)

An automated external defibrillator (AED) is a portable device that checks the heart rhythm and can send an electric shock to the heart to try to restore a normal rhythm. Early defibrillation is critical to survival from cardiac arrest for several reasons: (1) the most frequent initial rhythm in witnessed sudden cardiac arrest is ventricular fibrillation (VF); (2) the most effective treatment for VF is electrical defibrillation; (3) the probability of successful defibrillation diminishes rapidly over time; and (4) VF tends to convert to asystole within a few minutes. Early defibrillation with an AED has established benefit. The principle of early defibrillation suggests that the first person to arrive at the scene of a cardiac arrest should have a defibrillator. AEDs are user-friendly devices that can be used by trained or even untrained bystanders to save the life of cardiac arrest victims.

As soon as AED arrives, switch on the device and follow the spoken/visual information. Attach the electrodes to the victim's bare chest. Ensure that nobody is touching the victim while AED is analysing the rhythm, deliver shock if indicated and immediately restart CPR as directed by the prompts from the device.

Automated external defibrillators (AEDs) are safe to use. There are no reports of AEDs harming bystanders or users. Also, there are no reports of AEDs delivering inappropriate shocks.

Educational video

CPR with AED

<https://www.youtube.com/watch?v=vM9uOkNQ1HQ&t=12s>

CPR - BLS

<https://www.youtube.com/watch?v=S14OkP9xXgA&t=360s>

ERC guidelines

<file:///d:/Downloads/European-Resuscitation-Council-Guidelines-2021-Ba.pdf>