

CARDIOPULMONARY RESUSCITATION

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ABSTRACT: Cardiac arrest is a substantial public health problem estimated to account for 15–20% of all deaths^(1, 2) It is an important cause of cardiovascular morbidity and mortality in both developed and developing countries. Data from previous studies suggest that more than 3 million sudden cardiac deaths occur worldwide every year and the survival is lower than 8%⁽³⁻⁵⁾ It has also been estimated that by the end of the present decade, 60% of proportionately the incidence and prevalence is expected to rise.⁽⁶⁾ CPR is a part of an important integral medical procedure in emergency medical care. It is a combination of rescue breathing and chest compression, which is delivered to the victims who are thought to be in cardiac arrest.

KEYWORDS: Cardiac Arrest, CPR, ACLS

INTRODUCTION

Sudden death occurs when heartbeat & breathing stop suddenly or unexpectedly. The major role of CPR is to provide oxygen to the heart, brain, & other vital organ until medical treatment (advance cardiac life support-ACLS) can restore normal heart action. Sudden cardiac arrest (SCA) is a medical emergency. If not treated immediately, it causes sudden cardiac death. With fast and appropriate medical aid, survival is feasible. SCA is classified as in-hospital and out-of-hospital. Cardiopulmonary resuscitation (CPR) is an evolving lifesaving technique of modern medicine that comprises a series of lifesaving actions that improve the survival rates following SCAs⁽⁷⁾. In earlier days, CPR training was meant only for health care professionals. Later, it was noticed that many of these events occurred outside the hospital setting and that early CPR needs to be performed by the bystanders who witnessed the event. Hence, CPR is said to be a skill for all people^(8, 9) Quality of life is also found to be better for victims who immediately receive bystander CPR even in the absence of professional assistance. Studies have shown that immediate CPR after collapsing thanks to fibrillation doubles or maybe triples the probabilities of survival. In contrast, survival chances decrease by 7%–10% for every min CPR is delayed⁽¹⁰⁾.

DEFINITION

CPR is a basic emergency procedure for life support consisting of artificial and manual external cardiac massage - *Mosby medical dictionary*

Cardiopulmonary resuscitation (CPR) is a procedure used when a patient's heart stops beating and breathing stops. It can involve compressions of the chest or electrical shocks along with rescue breathing- *Angela Morrow RN*

INDICATIONS

1. Cardiovascular disorders

CAD, congenital heart diseases, coronary embolism, cardiac rupture & dissection

2. Pulmonary causes

Pulmonary embolism, pulmonary edema, asphyxia

3. Metabolic causes

Hypoglycemia, electrolyte imbalances

4. Fluid imbalance

Extensive hemorrhage, hypotension, shock

5. Neurological causes

Brain injuries, massive CVA

6. Poisons substance and drug overdose

Poisoning, propranolol overdose

Other causesElectrical shock, hypothermia, narcotic overdose⁽¹¹⁾**WARNING SIGNS OF CARDIOPULMONARY ARREST**

1. Early signs: Loss of consciousness
2. Late signs: Apnoea, Dilated pupils, Absence of heart sounds, convulsions
3. Other signs
 - ✓ Hypothermia
 - ✓ Cyanosis
 - ✓ Bradycardia
 - ✓ A weak or irregular pulse
 - ✓ Changes in respiratory rate ⁽¹²⁾

CPR CAN BE LIFE-SAVING FIRST AID

CPR can be life-saving first aid and increases the person's chances of survival if started soon after the heart has stopped beating. If no CPR is performed, it only takes three to four minutes for the person to become brain dead due to a lack of oxygen.

By performing CPR, you circulate the blood so it can provide oxygen to the body, and the brain and other organs stay alive while you wait for the ambulance. There is usually enough oxygen still in the blood to keep the brain and other organs alive for several minutes, but it is not circulating unless someone does CPR. CPR does not guarantee that the person will survive, but it does give that person a chance when otherwise there would have been none.

If you are not sure whether a person is in cardiac arrest or not, you should start CPR. If a person does not require CPR, they will probably respond to your attempts. By performing CPR, you are unlikely to cause any harm to the person if they are not actually in cardiac arrest.

CHAIN OF SURVIVAL

STEPS OF CPR

Remember to spell C-A-B Compressions:

(A) CIRCULATION- Promoting artificial circulation by external cardiac compression.

1. Place the heel of 1 hand over the center of the person's chest, between the nipples. Place other hands on top of the primary hand. Keep elbows straight and position shoulders directly above hands.
2. Use upper weight (not just arms) as pushing straight down on (compress) the chest
 - ✓ Compression rate: In adult victims of asystole, it's reasonable for rescuers to perform chest compressions at a rate of 100 to 120/min.
 - ✓ Compression depth: During manual CPR, rescuers should perform chest compressions to a depth of a minimum of two inches (5 cm) for a mean adult, while avoiding excessive chest compression depths (greater than 2.4 inches [6 cm])
 - ✓ Chest recoil- it's reasonable for rescuers to avoid leaning on the chest between compressions, to permit full chest wall recoil for adults in asystole.

If not trained in CPR, continue chest compressions until there are signs of movement or until emergency medical personnel take over.

(B) AIRWAY: Open the airway.

If the rescuer trained in CPR and performed 30 chest compressions, open the person's airway using the head-tilt, chin-lift maneuver. Put palm on the person's forehead and gently tilt the very best back. Then with the other hand, gently lift the chin forward to open the airway.

HEAD TILT CHIN LIFT MANOEUVRE

While pushing back on the forehead use your other hand to lift the chin forward

JAW THRUST MANOEUVRE

If you think the victim features a neck injury place your hands alongside the cheeks and pull the face toward you together with your index fingers

(C) BREATHING: Breath for the person

- 1. Rescue breathing is often mouth-to-mouth breathing or mouth-to-nose breathing if the mouth is seriously injured or cannot be opened.
- 2. With the airway open (using the head-tilt, chin-lift maneuver), pinch the nostrils shut for mouth-to-mouth breathing and canopy the person's mouth with yours, making a seal.
- 3. Prepare to offer two rescue breaths. Give the primary rescue breath lasting one
- 4. it's going to be reasonable for the provider to deliver 1 breath every 6 seconds (10 breaths per minute) while continuous chest compressions are being performed (ie, during CPR with a complicated airway).
- 5. The adequacy of breath given are often determined by observing the increase within the victim's chest
- 6. Continue CPR until there are signs of movement or emergency medical personnel take over⁽¹³⁾

CPR TECHNIQUES FOR YOUNG CHILDREN AND INFANTS

CPR steps for children aged eight years or younger are the same as for adults and older children, but the technique is slightly different.

Cpr for children aged 1–8 years

To perform CPR on children aged 1–8 years:

- Use the heel of **one** hand only for compressions, compressing to one-third of chest depth.
- Follow the basic steps for performing CPR described above.

CPR for infants (up to 12 months of age)

To perform CPR on infants (up to 12 months of age):

- Place the infant on their back. Do not tilt their head back or lift their chin (this is not necessary as their heads are still large in comparison to their bodies).
- Perform mouth-to-mouth by covering the infant's nose and mouth with your mouth – remember to use only a small breath.
- Do chest compressions, using two fingers of one hand, to about one-third of chest depth.
- Follow the basic steps for performing CPR described above.⁽¹²⁻¹⁶⁾

RECOVERY POSITION

What to do if the person recovers during CPR

CPR may revive the person before the ambulance arrives. If they do revive:

- Review the person's condition if signs of life return (coughing, movement, or normal breathing). If the person is breathing on their own, stop CPR and place them on their side with their head tilted back.
- If the person is not breathing, continue full CPR until the ambulance arrives.
- Be ready to recommence CPR if the person stops breathing or becomes unresponsive or unconscious again. Stay by their side until medical help arrives. Talk reassuringly to them.

It is important not to interrupt chest compressions or stop CPR prematurely to check for signs of life – if in doubt, continue full CPR until help arrives. It is unlikely you will harm if you give chest compressions to someone with a beating heart. Regular recovery (pulse) checks are not recommended as they may interrupt chest compressions and delay resuscitation.

STOPPING CPR

Generally, CPR is stopped when:

- The person is revived and starts breathing on their own
- Medical help such as ambulance paramedics arrive to take over
- The person performing the CPR is forced to stop from physical exhaustion⁽¹⁷⁾

COMPLICATIONS OF CPR

- Rib fractures
- Laceration related to the tip of the sternum.
- Injury of liver, lung, spleen
- Vomiting
- Aspiration

CONCLUSION

Cardiopulmonary arrest is loss of airway, breathing, or meaningful circulation. CPR is that the use of therapeutic interventions, primarily BLS that are designed to revive spontaneous circulation following the cardiac or pulmonary arrest. CPR is the responsibility of a team of personnel and not one person in isolation. For cardiac arrest we strive to prevent when possible, treat effectively when challenged and support humanely when death is imminent.

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