

# Revised Cardio Pulmonary Resuscitation

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## How to cite this article:

Firoj, Faroza, Ritu, S P Subhashini/Revised Cardio Pulmonary Resuscitation/J Cardiovasc Med Surg.2022;8(3): 87-89.

## Abstract

Cardio pulmonary resuscitation is a series of life saving technique, that improve the chances of survival which is used in many emergencies such as heart attack or near drowning, in which someone's breathing or heartbeat has stopped. The American Heart Association recommends starting CPR with hard and fast chest compressions. The newest development in CPR guideline is a change in basic life support sequence of step from A-B-C (Airway, Breathing, chest compressions) to C-A-B ( chest compressions, Airway, Breathing) for adults. Also, Hands only (compression only) CPR is emphasized for untrained rescuer.

**Keywords:** Cardiopulmonary resuscitation; Survival.

## INTRODUCTION

Cardiopulmonary resuscitation (CPR) refers to a series of emergency lifesaving action which is performed in an effort to manually resuscitate a person in cardiac arrest. In 1962 the American Heart Association (AHA) has established guidelines for cardiopulmonary resuscitation and Emergency cardiovascular care for the first time and from then the efforts to medically improve CPR has been continued up to now, and been applied continuously based on research results known from various clinical studies.

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**Received on:** 26.08.2022

**Accepted on:** 28.09.2022

## OBJECTIVES

To explain how to perform one rescuer cardiopulmonary resuscitation on a victim out of hospital cardiac arrest.

Explain how to perform cardiopulmonary resuscitation on infants and children.

Explain the steps involved in recognizing out of hospital cardiac arrest.

### *Etiology*

Every year almost 350,000 Americans die from heart disease. Half of these will die suddenly, outside of a hospital, because of the sudden cessation of spontaneous organized cardiac function. The most common cause of sudden cardiac arrest in adults is ventricular fibrillation. Although advances in emergency cardiac care continue to improve the chances of survival, sudden cardiac arrest remains a leading cause of death in many parts of the world. As of 2016, cardiac disease continues to be the

leading cause of death in the United States.

### *Epidemiology*

70% (Seventy percent) of cardiac arrests that occur outside of a hospital occur in the home. Half of these cardiac arrests are unwitnessed. Despite advances in emergency medical services, the survival rate remains low. Adult victims of non-traumatic cardiac arrest that receive resuscitation attempts by emergency medical services have a survival rate to hospital discharge of only 10.8%. In comparison, adult patients who experience cardiac arrest in a hospital setting have rates of survival to hospital discharge of up to 25.5%.

### *Evaluation*

The absence of a palpable pulse in an unresponsive patient indicates the need for CPR.

### *Differential Diagnosis*

A quick physical exam focused on palpable pulses and mental status is important as sometimes drug overdose, including heavy alcohol intake, may mimic cardiac arrest.

### *Prognosis*

According to 2015 AHA data, survival to hospital discharge in patients who experience out of hospital cardiac arrest remains low at 10.6%. 8.3% of patients experiencing cardiac arrest out of hospital will be discharged with good neurologic function. Witnessed cardiac arrests in patients receiving high quality CPR have a better prognosis, with 25.5% of patients surviving to hospital discharge.

## **COMPLICATIONS**

Cardiac arrest carries a dismal prognosis most patients do not survive. In those that do survive, their hospital course can be complicated by varying degrees of neurologic injury due to hypoxic encephalopathy. All organ systems can suffer ischemic injury. Chest compressions, when performed correctly, can cause rib fractures, which may be complicated by pneumothorax.

### *Other issues*

By definition, infant CPR applies to patients whose age is less than one year. Child CPR applies to patients from one year of age through puberty. From puberty onward, adult CPR guidelines apply. The modifications for infant and child CPR are listed below. All other aspects of CPR follow

the adult guidelines, including starting the process with the Compression first (CAB) sequence and the rate of compressions being 100 to 120 per minute. The sternum should be depressed to a depth of approximately one third of the anteroposterior diameter of the chest; this is about two inches in the child and 1.5 inches in the infant.

### *Child CPR Modifications*

Chest compressions on a child are performed by placing the heel of one or two hands (depending on the size of the child) over the lower half of the sternum. The chest is compressed to a depth of approximately two inches at a rate of 100 to 120 per minute. After 30 compressions, administer two sequential breaths and return to chest compressions. Continue the cycle of 30 compressions to two breaths until help arrives.

### *Infant CPR Modification*

Chest compressions on an infant are performed by placing two fingers on the sternum just below the nipple line. The infant's chest is compressed to a depth of approximately 1.5 inches at a rate of 100 to 120 per minute. After 30 compressions, administer two sequential breaths and return to chest compressions. Continue the cycle of 30 compressions to two breaths until help arrives.

### *In-hospital CPR*

Multiple rescuers are generally available in the hospital setting, and ventilation is usually performed with a bag-valve-mask (BVM) device. BVM ventilation needs to be performed by a provider skilled in its use. If the patient is not intubated, CPR is done by one provider performing chest compressions while the second provider provides breaths with BVM ventilation. The ratio of compressions to breaths in this situation changes to 15 compressions to two breaths. Once a patient is intubated, it is unnecessary to perform cycles of compressions and ventilation chest compressions are performed continuously, while rescue breaths are given independently via the BVM at a rate of 10 per minute (one breath every six seconds). Novice operators frequently tend to provide BVM ventilations at a higher rate than this.

## **CONCLUSION**

The management of patients with cardiopulmonary arrest both inside and outside hospital requires early identification and high quality resuscitation, including defibrillation wherever feasible.

Following the algorithms for resuscitation would improve the overall outcome. The current recommendations and guidelines recommend compression only CPR for lay rescuers and timely referral or transfer. Simultaneous identification and correction if the cause of the cardiac arrest while continuing resuscitation, and appropriate post resuscitation care can reduce the mortality by up to 40.

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