

### 3.1 Introduction to first aid and CPR

During medical emergency and accidents, **first aid** is the first and immediate help given to a sick or injured person, which may include cardiopulmonary resuscitation (CPR) while waiting for an ambulance/ medical help. First aid can be performed by someone with basic medical training or, even untrained person.

Everyone should learn CPR properly, and also how to use an automated external defibrillator (AED). AED is a machine that is used for electric shock in case of cardiac arrest (stoppage of heart). The AED is usually available at public places/ commercial set-ups like malls, cinema halls and airports etc.

The primary aim of first aid is to minimize pain, prevent death or serious injury from worsening. The key objectives of first aid are as follows:

1. The primary objective of first aid is to minimize the pain and save lives. First aid done correctly should help reduce the patient's pain and stabilise the patient.
2. First aid also includes addressing the external factors, such as moving a patient away from any cause of harm or site of accident, away from fire as smoke may cause further choking, and applying first aid techniques to prevent worsening of the condition.
3. It would also include to accelerate the recovery from the illness or injury, and in some cases might involve completing a treatment, such as applying adhesive bandage to a small wound or supporting a broken arm or leg.

It is important to note that first aid cannot be compared with the care what a trained medical professional provides. First aid involves making common sense decisions in the best interest of an injured person in an emergency situation.

Following (ABCD) points may be noted in the patient during such emergency :

1. **Airways** : Airways are clear ?
2. **Beathing** : Respiration is adequately maintained ?
3. **Circulation** : any possibility of internal bleeding ?
4. **Disability** : difficulty in body functions or, activity limitations ?

In such scenario, the following points should be kept in mind and appropriate actions taken accordingly for the benefit of the patient :

1. Is the environment safe for the person?
2. Is the person conscious or unconscious?
3. If the person appears unconscious, tap & talk, shake his/her shoulder and ask loudly (shout) , "Are you okay?"
4. Call your local emergency helpline number.
5. Look & listen : See the movements of chest, and try to listen breathing sound
6. Try to feel pulse at neck (carotid artery, one side, not more than 10 seconds)
7. Begin CPR.
8. If an AED is available, deliver one shock as instructed, then begin CPR.

### CPR

Cardiopulmonary resuscitation (CPR) is a lifesaving procedure. It's very useful where someone's breathing and/or heartbeat has stopped. Nowadays it is expected that everyone should learn CPR. This may save someone's life during emergency.

There can be two situations regarding CPR :

1. If you're not trained and not confident about CPR, then provide hands-only CPR. That means chest compressions of 100 times in a minute until medical help arrives.
2. If you're well-trained, start CPR with 30 chest compressions followed by two rescue breaths (mouth to mouth resuscitation; mask may be used to prevent transmission of infection).

CPR can keep oxygenated blood flowing to the brain and other vital organs until more definitive medical treatment restores a normal heart activity.

When the heart stops, the lack of oxygenated blood can cause brain damage in only a few minutes. A person may die within 5 to 10 minutes.

### **CPR : Compression only (hands-only); C-A-B**

For adults with cardiac arrest, compression-only (hands-only) CPR involves chest compressions without ventilation support. It is recommended as the method of choice for the untrained person (helper) as it is easier to perform.

The recommended order of interventions is chest compressions, airway, breathing (CAB) in most situations, with a compression rate of at least 100 per minute in all groups. Recommended compression depth in adults and children is about 5 cm (2 inches) and in infants it is 4 centimetres.

In adults, rescuers should use two hands for the chest compressions, whereas in small children one hand should be used and two fingers (index and middle fingers) should be used in babies (infants).

Compression-only CPR is not as good for children who are more likely to have cardiac arrest from respiratory causes. Both, children and adults, should receive about 100 chest compressions per minute.

### **ABC vs CAB**

The order of CPR interventions in new-born babies : airway, breathing, chest compressions (ABC) whereas in adults and children : chest compressions, airway, breathing (CAB).

### **CPR : Compressions with rescue breaths**

Please note this should be tried only if you are well trained in CPR.

### **Mouth-to-mouth resuscitation**

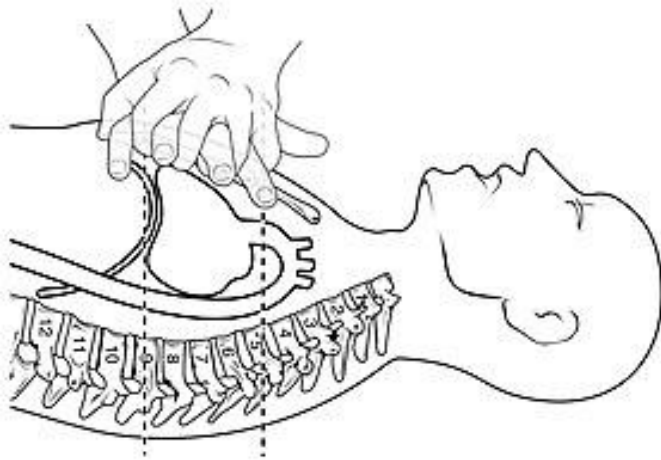
A universal compression to ventilation ratio of 30:2 is recommended for adults, it means 30 times chest compression followed by 2 rescue breaths, then repeat the same cycle again and again till the medical help arrives.

With children, if at least 2 trained rescuers are present a ratio of 15:2 can be maintained. Rescue breaths for children and especially for babies should be relatively gentle.

### CPR : Method : C-A-B

#### **Compressions**

1. Put the person on his/her back on a firm surface.
2. Kneel next to the person's neck and shoulders.
3. Place the heel of one hand over the centre of the person's chest, between the nipples. Place your other hand on top of the first hand. Keep your elbows straight and position your shoulders directly above your hands.
4. Use your upper body weight as you push straight down on the chest at least 2 inches (approximately 5 cm). Push hard at a rate of 100 compressions a minute.
5. If you haven't been trained in CPR, continue chest compressions until there are signs of movement or until emergency medical help arrives. If you have been trained in CPR, go on to next step, opening the airway and rescue breathing.



CPR method, compression (Source: Wikipedia)

#### **Airway**

If you're trained in CPR and you've performed 30 chest compressions, open the person's airway. Put your palm on the person's forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway.

#### **Breathing**

Rescue breathing can be mouth-to-mouth breathing or mouth-to-nose breathing if the mouth is seriously injured or can't be opened. A mask may be used to prevent transmission of infection.

1. With the airway open, pinch the nostrils shut for mouth-to-mouth breathing and cover the person's mouth with yours, making a seal.
2. Prepare to give two rescue breaths. Thirty chest compressions followed by two rescue breaths is considered one cycle.
3. Resume chest compressions.
4. As soon as an automated external defibrillator (AED) is available, use it while following the instructions.
5. Continue CPR until there are signs of movement or emergency medical help arrives.



Mouth to mouth resuscitation (Source: Wikipedia)

### **CPR in children : C-A-B**

#### **Compressions**

If you are alone, perform five cycles of compressions and breaths on the child — this should take about two minutes — before calling your local emergency help number and getting the AED, if one is available.

1. Put the child on the back on a firm surface.
2. Kneel next to the child's neck and shoulders.
3. Use two hands, or only one hand if the child is very small, to perform chest compressions. Press straight down on the chest about 2 inches (approximately 5 cm). Push hard at a rate of 100 to 120 compressions a minute.

4. If you haven't been trained in CPR, continue chest compressions until there are signs of movement or until emergency medical help arrives. If you have been trained in CPR, go on to next step, opening the airway and rescue breathing.

### **Airway**

If you're trained in CPR and you've performed 30 chest compressions, open the child's airway. Put your palm on the child's forehead and gently tilt the head back. Then with the other hand, gently lift the chin forward to open the airway.

### **Breathing**

Use the same compression-breath rate that is used for adults: 30 compressions followed by two breaths. This is one cycle.

1. With the airway open, pinch the nostrils shut for mouth-to-mouth breathing and cover the child's mouth with yours, making a seal.
2. Prepare to give two rescue breaths. Give the first rescue breath — lasting one second — and watch to see if the chest rises. If it does rise, give the second breath.
3. After the two breaths, immediately begin the next cycle of compressions and breaths. If there are two people performing CPR, conduct 15 compressions followed by two breaths.
4. As soon as an AED is available, use it while following the instructions.
5. Continue CPR until the child moves or emergency medical help arrives.