

Chapter 5. Cardiopulmonary Resuscitation (CPR) and Emergency Response Part 1. Understanding CPR

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Part 1 • Understanding CPR

(How to recognise cardiac arrest—and what to do, step by step, for adults, children, and infants)

1 What Is CPR and Why Is It Done?

CPR stands for **Cardiopulmonary Resuscitation**—a life-saving technique used when someone's heart stops beating or they stop breathing normally. The goal is to keep blood (with oxygen) flowing to the brain and vital organs until professional help arrives.

- **Cardio** = heart
- **Pulmonary** = lungs
- **Resuscitation** = revive from unconsciousness or apparent death

2 Basic Life Support (BLS) — The Foundation of Emergency Care

BLS is a set of simple actions performed in order to support breathing and circulation in a person with cardiac arrest, respiratory arrest, or choking. The basic steps can be remembered by the acronym **DR A B C D**:

Step	Action	Details
D - Danger	Make sure the area is safe for you and the casualty	Remove live wires, traffic, fire, etc.
R - Response	Check if the person is conscious	Tap shoulders, shout "Are you okay?"
A - Airway	Open the airway	Head-tilt, chin-lift (unless spinal injury suspected: use jaw-thrust)
B - Breathing	Check breathing	Look, listen, and feel for normal breaths (max 10 seconds)
C - Circulation/Compressions	If not breathing, start chest compressions	Start CPR: push hard and fast in the centre of the chest
D - Defibrillation/Doctor	Attach AED if available and call for help	Use an Automated External Defibrillator (AED) as soon as possible

3 Adult CPR Protocol (Age: Puberty and Above)

If you see someone collapse:

1. **Check response:** Tap and shout.
2. **Call for help:** Shout for help; ask someone to call emergency (dial **112** in India) and get an AED.
3. **Check breathing:** No breathing or only gasping? Start CPR.
4. **Start chest compressions:**
 - Place heel of one hand in centre of chest (lower half of breastbone), other hand on top.
 - Keep arms straight, shoulders over hands.
 - **Compress at least 5 cm (2 inches), but not more than 6 cm.**
 - **Rate: 100-120 compressions per minute.**

- Allow full recoil; minimize interruptions.
- 5. **Give rescue breaths:** (if trained and willing)
 - After 30 compressions, give **2 breaths**.
 - Tilt head, lift chin, pinch nose, make seal, blow until chest rises (about 1 second).
 - Resume compressions immediately.
 - If not confident, "**hands-only**" **CPR** (compressions only) is much better than nothing.
- 6. **Continue:** Until AED arrives, the person revives, or professional help takes over.

4 Child CPR Protocol (Age: 1 year to puberty)

Key differences from adult CPR:

- Use **one or two hands** for compressions, depending on child size.
- **Compression depth:** About **5 cm (2 inches)**.
- Same rate: 100-120/min.
- Give **30 compressions, 2 breaths** if alone; if two rescuers, use **15 compressions, 2 breaths**.
- If you are alone and did not witness the collapse: Give **2 minutes of CPR first**, then leave to call for help.

Stepwise:

1. Check safety, response, airway, breathing.
2. If unresponsive and not breathing, start compressions.
3. 30 compressions, 2 breaths (or 15:2 with two rescuers).
4. Use AED as soon as available (pediatric pads if possible).

5 Infant CPR Protocol (Under 1 year)

Key differences:

- Use **two fingers** (just below the nipple line) for compressions.
- **Depth:** About **4 cm (1.5 inches)**.
- **Rate:** 100-120 per minute.
- **Compressions to breaths:** 30:2 if alone, 15:2 if two rescuers.
- Open airway carefully—avoid overextension (neutral position).
- Cover infant's nose and mouth with your mouth for rescue breaths.

Stepwise:

1. Check for response, breathing.
2. Call for help after 2 minutes if alone and unwitnessed.
3. Start 30 compressions with two fingers, then 2 gentle puffs of breath.
4. Continue until help arrives or infant revives.

6 Using an Automated External Defibrillator (AED)

- **Turn on AED and follow prompts.**
- **Expose chest, apply pads as shown (upper right, lower left).**
- **Stand clear during rhythm analysis and shock delivery.**
- **Resume CPR immediately after shock or if no shock advised.**

Use child pads and settings if available for children and infants; otherwise, use adult pads if that's all you have.

7 Choking—Quick Action for All Ages

- **Adult/Child:** Ask if they are choking; if cannot cough/speak—do abdominal thrusts (Heimlich maneuver).
- **Infant:** 5 back blows (between shoulder blades), then 5 chest thrusts (like CPR but slower).

8 Self-Check Quiz

1. What is the first thing you do before starting CPR?
2. What is the correct compression depth for adults? For infants?
3. What is the chest compression to breath ratio for one rescuer in a child?
4. If you are alone with an unresponsive child, should you leave to call for help or start CPR?
5. Why is it important to let the chest recoil fully between compressions?

Answers:

1. Check scene safety (Danger).
2. Adults: at least 5 cm, not more than 6 cm; Infants: about 4 cm.
3. 30 compressions : 2 breaths.
4. If not witnessed: 2 minutes of CPR, then call for help.
5. Full recoil lets the heart fill with blood between compressions.

9 Key Take-Home Points

- **Act quickly:** Every minute delay in CPR reduces survival by 7-10 %.
- **Push hard, push fast, don't stop:** Good compressions are the most important step.
- **Rescue breaths help, but if unsure—do compressions only.**
- **AEDs save lives—use them as soon as available.**
- **Special modifications for children and infants—know the depth and hand position.**

Practical Lab:

Practice chest compressions on a manikin, aiming for the correct depth and rate. Pair up and take turns giving rescue breaths and using an AED trainer. Run through adult, child, and infant scenarios until you can switch protocols confidently without notes.