Vital signs

Vital signs

- Temperature
- Pulse (Heart Rate)
- Respiratory rate
- Blood pressure
- Oxygen saturation

Temperature

1. Temperature

- **Normal range:** 36.5°C–37.5°C (97.7°F–99.5°F)
- **Methods of measurement:** Oral, rectal, axillary, tympanic, temporal.
- **Clinical significance:**
  - **Fever (pyrexia):** >38°C – may indicate infection, inflammation, or other systemic issues.
  - **Hypothermia:** <35°C – can occur with prolonged exposure to cold, sepsis, or metabolic conditions.

Pulse

- **Normal range**: 60–100 beats per minute (bpm) in adults.
- **Assessment site**: Radial, carotid, femoral, apical, etc.
- **Characteristics** to assess: Rate, rhythm (regular/irregular), volume (strong/thready).
- Clinical significance:
    - **Tachycardia**: >100 bpm – due to fever, anxiety, hypovolemia, anemia, or cardiac conditions.
    - **Bradycardia**: <60 bpm – may be normal in athletes or indicate cardiac or neurological issues.

Respiratory rate

- **Normal range**: 12–20 breaths per minute in adults.
- **Assessment**: Count chest rises for 30 seconds and multiply by 2.
- **Clinical significance**:
  - Tachypnea: >20 – caused by anxiety, hypoxia, infection, acidosis.
  - Bradypnea: <12 – may result from drug overdose, neurological impairment.

Blood Pressure

- **Normal range**: <120/80 mmHg (systolic/diastolic).
- **Measurement method**: Manual (sphygmomanometer) or automatic cuff.
- **Clinical significance**:
  - Hypertension: >140/90 – risk for heart disease, stroke, kidney failure.
  - Hypotension: <90/60 – may indicate shock, dehydration, or endocrine disorders.

Oxygen saturation (SpO2)

- **Normal range:** 95%–100%
- **Measurement:** Pulse oximeter (non-invasive sensor on finger or earlobe).
- **Clinical significance:**
  - **Hypoxemia:** <90% – indicates respiratory compromise or poor oxygen delivery.

Cardiopulmonary Resuscitation (CPR)

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Definition

Cardiopulmonary resuscitation (CPR) is a lifesaving technique that's useful in many emergencies, such as a heart attack or near drowning, in which someone's breathing or heartbeat has stopped.

Introduction

- CPR can keep oxygen-rich blood flowing to the brain and other organs until emergency medical treatment can restore a typical heart rhythm. When the heart stops, the body no longer gets oxygen-rich blood. The lack of oxygen-rich blood can cause brain damage in only a few minutes.

- If you are untrained and have immediate access to a phone, call 911 or your local emergency number before beginning CPR. The dispatcher can instruct you in the proper procedures until help arrives.

Steps for CPR

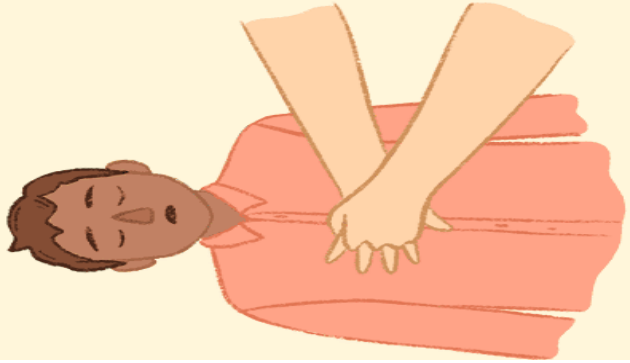
Step-by-Step CPR Guide

1. Shake and shout

2. Call 911

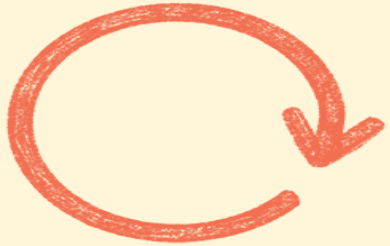
3. Check for breathing

4. Place your hands at the center of their chest



5. Push hard and fast—about twice per second

6. If you've had training, repeat cycles of 30 chest pushes and 2 rescue breaths



Importance of CPR

Survival:

- Circulating blood that contains oxygen is required to keep tissues in the body alive and functioning. The brain may sustain damage after blood flow has been stopped for about 4 minutes. There is irreversible damage to the brain after blood flow has stopped for 7 minutes.
- To be successful, CPR should be started within 6 minutes of a person having a sudden cardiac arrest. Low body temperatures (hypothermia), seen in near-drownings and exposure to the cold, prolong the time that the brain can survive.

CPR

Get Help!

- Activate emergency response: **Call 911** and shout for help
- **Get AED**, turn it on and follow prompts when it arrives

Signs of Life

- No Response? Abnormal breathing?
- Perform CPR immediately

C ompressions x 30

- Place two hands on center of chest
- **Push hard** (5cm deep) **Push fast** (100/min)

A irway

- Push chin up and tilt head back
- Clear any obstructions with finger sweep

B reaths x 2

- Use a pocket mask or bag-valve-mask
- Slow breaths, just enough for the chest to rise

Repeat cycles of **30 breaths** and **2 ventilations** until help arrives

Why CPR?

Recognition:

- Early recognition of cardiac arrest is a key step in initiating early treatment. After witnessing a person collapse, or coming upon an unresponsive person:
  - Assess the area quickly to make sure it is safe to approach the person
  - Confirm unresponsiveness by tapping the person on the shoulder and shouting something such as “are you OK?”
  - If no response, call for help, and initiate chest compressions.
  - Do not delay chest compressions if a pulse cannot be felt within 10 seconds.

Before CPR

Make sure the environment is safe. A fire, traffic accident, or other danger could put your own life at risk.

Try to wake the person. Tap on the person's shoulder firmly and ask "Are you OK?" in a loud voice. Move on to the next steps after five seconds of trying to wake the patient.

Call 911. Anytime a patient won't wake up, call 911 immediately or ask a bystander to call. Even if you will perform CPR on the spot, it's important to get paramedics to the scene as quickly as possible.

Before CPR

Put the person on their back. If it's possible that the person may have had a spinal injury, turn them carefully without moving the head or neck.

Check for breathing. Tilt the patient's head back to open the airway and determine if they are breathing. If the patient doesn't take a breath after 10 seconds, start CPR.

How to Do CPR?

Chest compressions

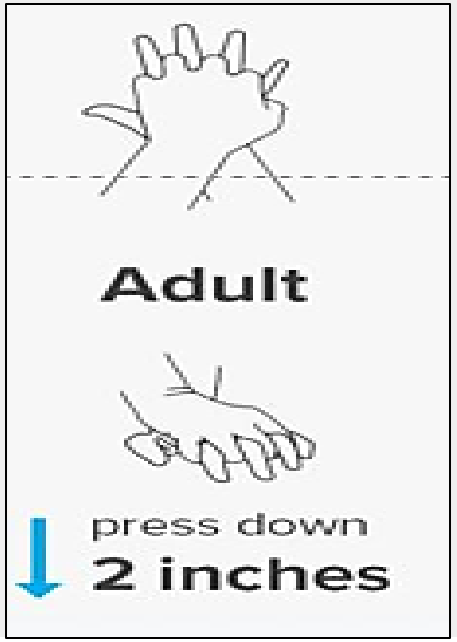
- Follow the mantra: “Push hard and push fast on the center of the chest”
- Compress the chest at least 2 inches with each down-stroke
- Compress at a rate of 100 compressions per minute
- Minimize the frequency and duration of interruptions while performing chest compressions Chest compressions with ventilations can be provided by those trained in the technique and will be done by professional rescuers.

How to Do CPR

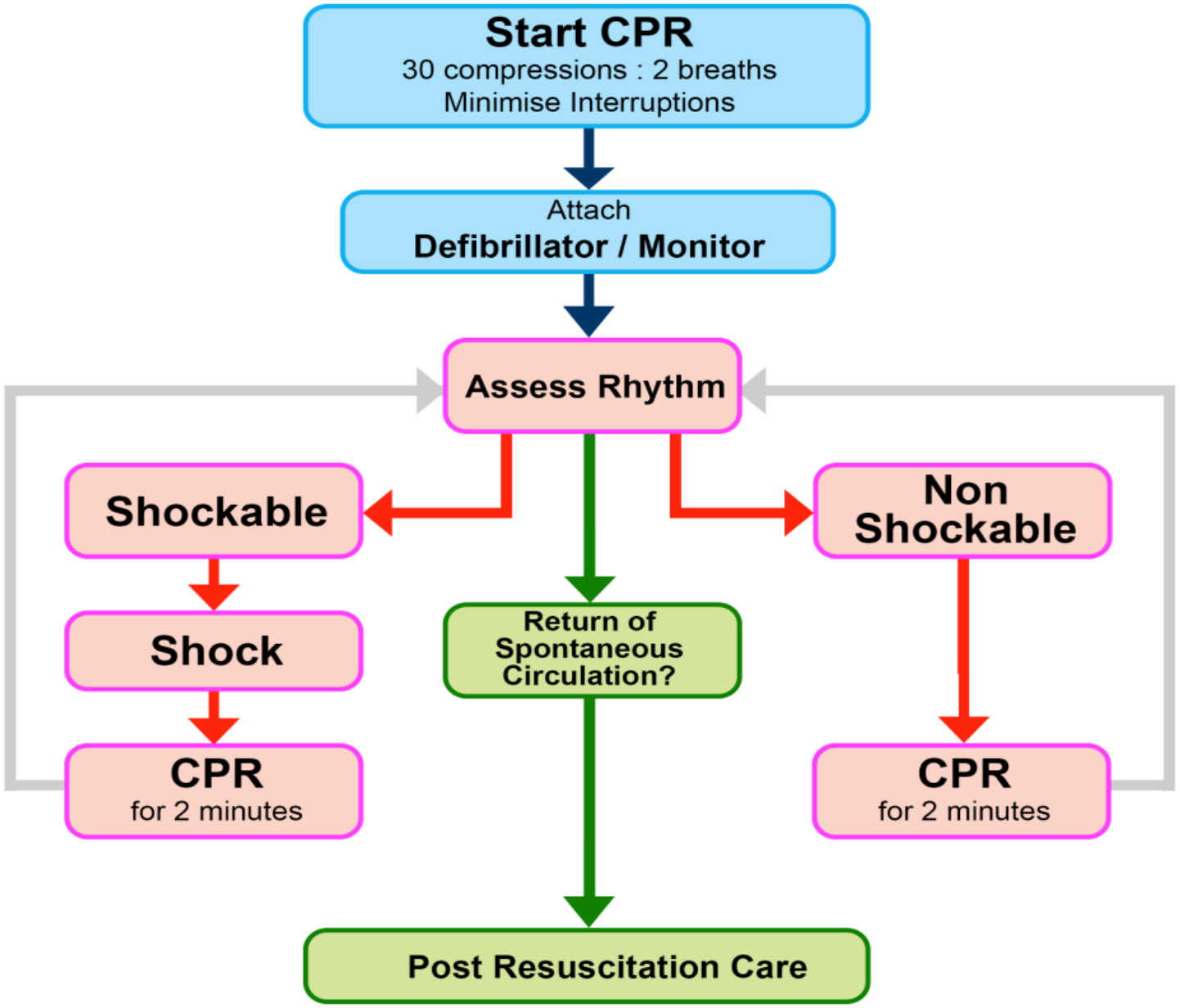
In Adults:

- **Place your hands on the person's chest**. Place your other hand on top of that hand. Center your weight directly over your hands.
- **Perform chest compressions**. Push hard, to a depth of at least 2 inches (but no deeper than 2.4 inches) and fast—about twice per second until the person responds.

- **Give rescue breaths**. push on the chest 30 times, then give two rescue breaths.
- **Repeat**. Repeat cycles of 30 chest compressions and two breaths until help arrives or the patient wakes up.



Advanced Life Support for Adults



During CPR

Airway adjuncts (LMA / ETT)
Oxygen
Waveform capnography
IV / IO access
Plan actions before interrupting compressions
(e.g. charge manual defibrillator)

Drugs

Shockable

* Adrenaline 1 mg after 2nd shock (then every 2nd loop)
* Amiodarone 300mg after 3 shocks

Non Shockable

* Adrenaline 1 mg immediately (then every 2nd loop)

Consider and Correct

Hypoxia
Hypovolaemia
Hyper / hypokalaemia / metabolic disorders
Hypothermia / hyperthermia
Tension pneumothorax
Tamponade
Toxins
Thrombosis (pulmonary / coronary)

Post Resuscitation Care

Re-evaluate ABCDE
12 lead ECG
Treat precipitating causes
Aim for: SpO2 94-98%, normocapnia and normoglycaemia
Targeted temperature management