Cardiac arrest & Advanced Life Support (ALS)

- Cardiac arrest is the **abrupt loss of heart function in a person who may or may not have been diagnosed with heart disease**.

- It can come on suddenly or in the wake of other symptoms.

- Cardiac arrest is often fatal if appropriate steps aren't taken immediately.

- **It's a clinical diagnosis!**

- Confirm diagnosis: a patient who is unresponsive and not breathing properly is in cardiac arrest (a manual pulse check is inaccurate and not recommended).

Causes of cardiac arrest

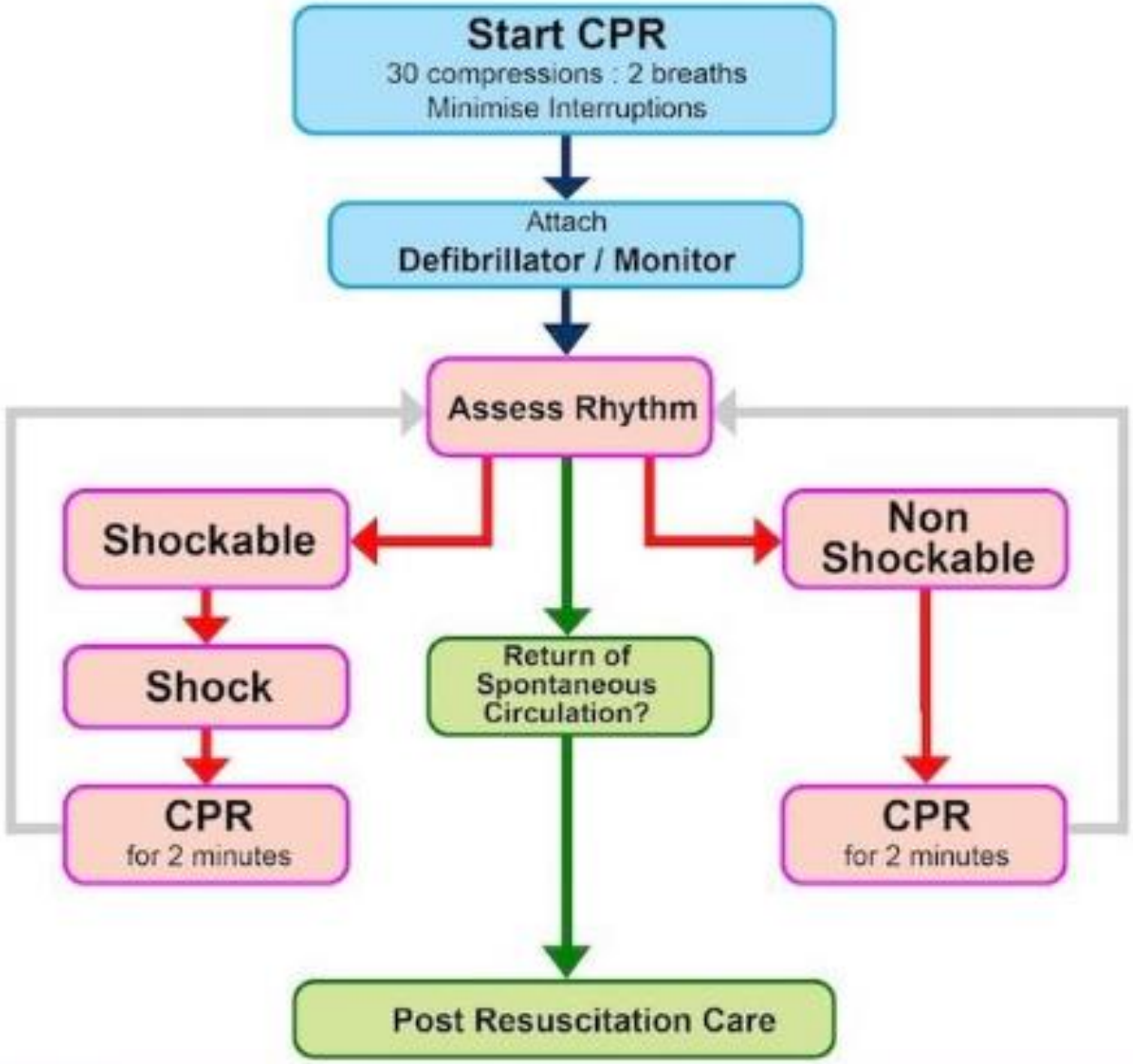
1. Ventricular fibrillation
2. Ventricular tachycardia
3. Asystole
4. Pulseless electrical activity

Management of cardiac arrest

1. Basic life support- Usually done by laymen when there's no medical equipment available.
2. Advanced life support- Done by medical professionals wihen the necessary drugs & equipments are available.

Advanced life support

- Started as soon after the diagnosis of cardiac arrest.
- Continue chest compressions while adhesive defifibrillation/monitoring pads are put in place. Plan all actions before pausing chest compressions.
- Stop chest compression for <5s to assess rhythm. Determine whether the rhythm is shockable (VF/pulseless VT) or non-shockable (asystole, pulseless electrical activity).



Ventricular fibrillation and pulseless VT

- Ventricular tachycardia when rapid can cause ineffective cardiac output which is pulseless.
- When the damage is severe pulseless VT can progress into V.Fib
- Defibrillation is effective in this group.

Asystole

- When the conduction system is failed or in a massive ventricular damage post-MI
- Cardiac massage, IV atropine, IV adrenaline may be useful.
- If the conduction system is failed-permanent pacemaker implantation might be necessary.

Pulseless electrical activity

- No effective Cardiac output in the presence of an organized electrical activity.
- Often due to life threatening conditions such as cardiac rupture and massive pulmonary embolism, therefore carries a poor prognosis
- But can also be due to reversible causes such as pneumothorax, hypovolemia, cardiac tamponade.

During CPR

1. Correct reversible causes
2. Check electrode position and contact
3. Attempt/ verify IV access & airway
4. Give uninterrupted compressions when airway is secure
5. Give adrenaline every 3-5 minutes
6. Consider amiodarone, atropine, magnesium

- **Coronavirus (COVID-19) advice**

If there's a chance the person who's unwell has COVID-19, place a cloth or towel over their mouth and nose and do hands-only CPR until an ambulance arrives.

Reversible causes

4 H's	4 T's
Hypoxia	Tension pneumothorax
Hypovolemia	Tamponade
Hypokalemia/ hyperkalemia	Toxins
Hypothermia	Thrombosis (coronary or pulmonary)

- After a shock CPR should be given without checking for a pulse because mechanical Cardiac output rarely occurs immediately after a successful defibrillation.
- Amiodarone is given after 3rd shock in shockable rhythm only.
- Adrenaline every 3-5 minutes minutes (every 2nd cycle)→ In shockable rhythm every 2nd cycle and in a loop afterwards. In non-shockable rhythm initially give a dose of adrenaline and then continue every 2nd loop.

Chest compressions

- Place the heel of your hand on the centre of the person's chest, then place the palm of your other hand on top and press down by 5 to 6cm (2 to 2.5 inches) at a steady rate of 100 to 120 compressions a minute.

- After every 30 chest compressions, give 2 rescue breaths.

Chest compressions

- Tilt the person's head gently and lift the chin up with 2 fingers. Pinch the person's nose. Seal your mouth over their mouth and blow steadily and firmly into their mouth for about 1 second. Check that their chest rises. Give 2 rescue breaths.

- Continue with cycles of 30 chest compressions and 2 rescue breaths until they begin to recover or emergency help arrives

spontaneous circulation (ROSC)

1. Use ABCDE approach
2. Aim for Spo2 94-98%
3. Aim for normal PaCO2
4. 12-lead ECG
5. Treat precipitating cause
6. Targeted temperature management