

# Cardiopulmonary Resuscitation

ILCOR 2010 Guidelines

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- American Heart Association (AHA)
- European Resuscitation Council (ERC)
- Heart and Stroke Foundation of Canada (HSFC)
- Australian and New Zealand Committee on Resuscitation (ANZCOR)
- Resuscitation Councils of Southern Africa (RCSA)
- Inter American Heart Foundation (IAHF)
- Resuscitation Council of Asia (RCA - current members Japan, Korea, Singapore, Taiwan)



**E**uropean  
**R**esuscitation  
**C**ouncil

Interdisciplinary Council For Resuscitation Medicine and Education



**Resuscitation Council (UK)**



*Conseil Français  
de Réanimation  
Cardio-pulmonaire*

Accueil

**Recommandations - ERC 2010**

**Preserve life by improving Standards of Resuscitation**

# ILCOR

## Aims and Objectives

1. Provide international forum for CPR, CCR
2. Foster scientific research
3. Provide mechanism to collect information, evidence
4. Disseminate information worldwide
5. Provide statements and guidelines with international consensus



ILCOR

## Working Groups and Task Forces (6)

1. Basic life support (BLS)
2. Advance life support (ALS)
3. Acute coronary syndromes (ACS)
4. Pediatric life support (PLS)
5. Neonatal life support (NLS)
6. Education, implementation and teams (EIT)

# ILCOR

## Preparation of Guidelines 2010

1. Last 3 years. 2 meeting per year. USA and elsewhere
2. Dallas Feb 2010
3. 313 experts from 30 countries
4. Review collected information, evidence
5. International consensus
6. Final statement on CPR and treatment  
Recommendations

# ILCOR

## From Science to Guidelines

### Chain of survival





## Some facts and figures

1. Ischaemic heart disease as a leading cause of death in the world (40%)
2. Sudden cardiac arrest most likely due to coronary artery disease (60%)
3. Ventricular fibrillation most common cardiac arrest rhythm
4. Survival to hospital discharge is 10% for all rhythms and 21% for VF in Europe, and for USA 8% and 22%



# ILCOR

## 2010 Guidelines

1. Executive summary;
2. Adult basic life support and use of automated external defibrillators;<sup>4</sup>
3. Electrical therapies: automated external defibrillators, defibrillation, cardioversion and pacing;<sup>5</sup>
4. Adult advanced life support;<sup>6</sup>
5. Initial management of acute coronary syndromes;<sup>7</sup>
6. Paediatric life support;<sup>8</sup>
7. Resuscitation of babies at birth;<sup>9</sup>
8. Cardiac arrest in special circumstances: electrolyte abnormalities, poisoning, drowning, accidental hypothermia, hyperthermia, asthma, anaphylaxis, cardiac surgery, trauma, pregnancy, electrocution;<sup>10</sup>
9. Principles of education in resuscitation;<sup>11</sup>
10. The ethics of resuscitation and end-of-life decisions.<sup>12</sup>

# Guidelines 2010

## Executive Summary

### A. Basic life support

1. Strong emphasis on delivery of good quality chest compressions. Depth:5cm. CC:100/min. Ratio CC 30:2 breaths
2. All rescuers trained or not should provide chest compressions to victims
3. Trained Dispatchers.
4. Use of prompt/ feedback devices



# Guidelines 2010

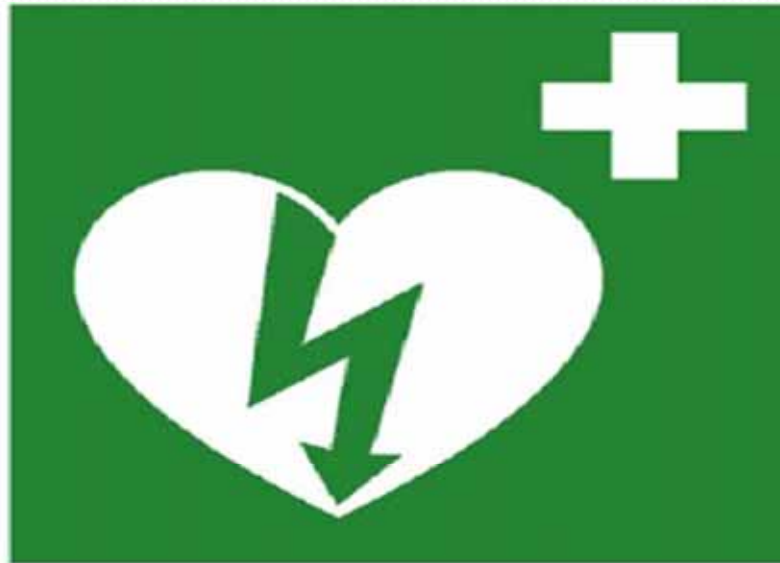
## Executive Summary

### B. Automated external defibrillators

1. Strong emphasis on early uninterrupted CC
2. Emphasis on early defibrillation
3. Minimised Pre and Post shock pauses
4. Deployment of AED in public and residential areas



# Automated external defibrillators



**Fig. 2.23.** Universal ILCOR signage to indicate presence of an AED. This sign can be combined with arrows to indicate the direction of the nearest AED.

# Guidelines 2010

## Executive Summary

### C. Adult Advanced Life Support

1. Increased emphasis on the importance of minimally interrupted high quality chest compression throughout ALS
2. Increased emphasis on detection and treatment of patients to prevent cardiac arrest. Warning signs. MET, RRT, CCOT
3. Delivery of drugs via a tracheal tube is no longer recommended. If no I/V access drugs should be given by Intraosseous route (IO)

Contd

# Guidelines 2010

## Executive Summary

### C. Adult Advanced Life Support

4. Reduced emphasis on early tracheal intubation unless achieved by highly skilled individuals with minimal interruption to chest compressions
5. Increased emphasis on capnography
6. Atropine is no longer recommended for routine use in asystole or PEA
7. Post-resuscitation treatment protocol to improve survival and quality of life





## Section 4: Adult Advanced Life Support

1. Summary of changes since 2005 Guidelines
2. Prevention of in-hospital cardiac arrest
3. Pre-hospital resuscitation
4. In-hospital resuscitation
5. ALS treatment algorithm
6. Airway management and ventilation
7. Assisting the circulation
8. Peri-arrest arrhythmias
9. Post-resuscitation care

## Section 4: Adult Advanced Life Support

### Prevention of in-hospital cardiac arrest

- Recognition of critically ill patient in general wards
- Special area in ward. Monitoring
- Call for help. Medical emergency team, rapid response team, critical care outreach team
- Staffing
- Appropriate measures to prevent in-hospital cardiac arrest



## Section 4: Adult Advanced Life Support

### Airway management and ventilation

- Basic airway management (oxygen, suction, oral airways)
- Laryngeal mask airways, combitubes, laryngeal tubes
- Tracheal intubation. Capnography



## Section 4: Adult Advanced Life Support

### Assisting the circulation

- Drugs and fluids for cardiac arrest
- Vasopressors: adrenaline...vasopresin
- Anti-arrhythmics: Amiodarone...lidocaine
- Magnesium
- Atropine
- Calcium chloride
- Sodium bicarbonate
- Fluids: NS, RL, Balsol. IV or IO

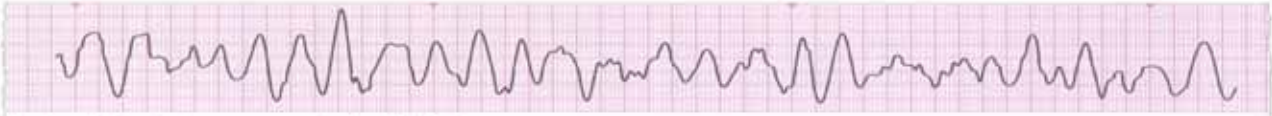
# Cardiac rhythms

1. Peri-arrest rhythms
  - a. Tachycardias (supraventricular, narrow or broad complex,
  - b. Bradycardias
2. Arrest rhythms
  - a. Shockable : Ventricular Fibrillation  
: Ventricular Tachycardia
  - b. Non shockable: Asystole  
Pulseless electrical activity

### Rhythm Strips



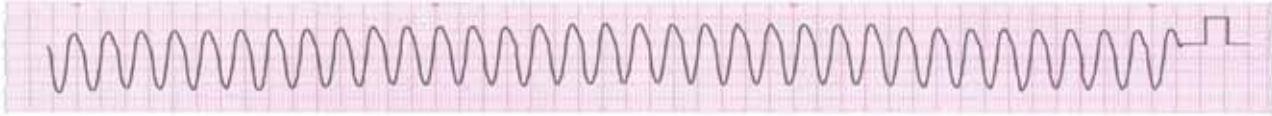
Rhythm Strip 1. Normal sinus rhythm



Rhythm Strip 2. Coarse ventricular fibrillation



Rhythm Strip 3. Fine ventricular fibrillation



Rhythm Strip 4. Ventricular tachycardia

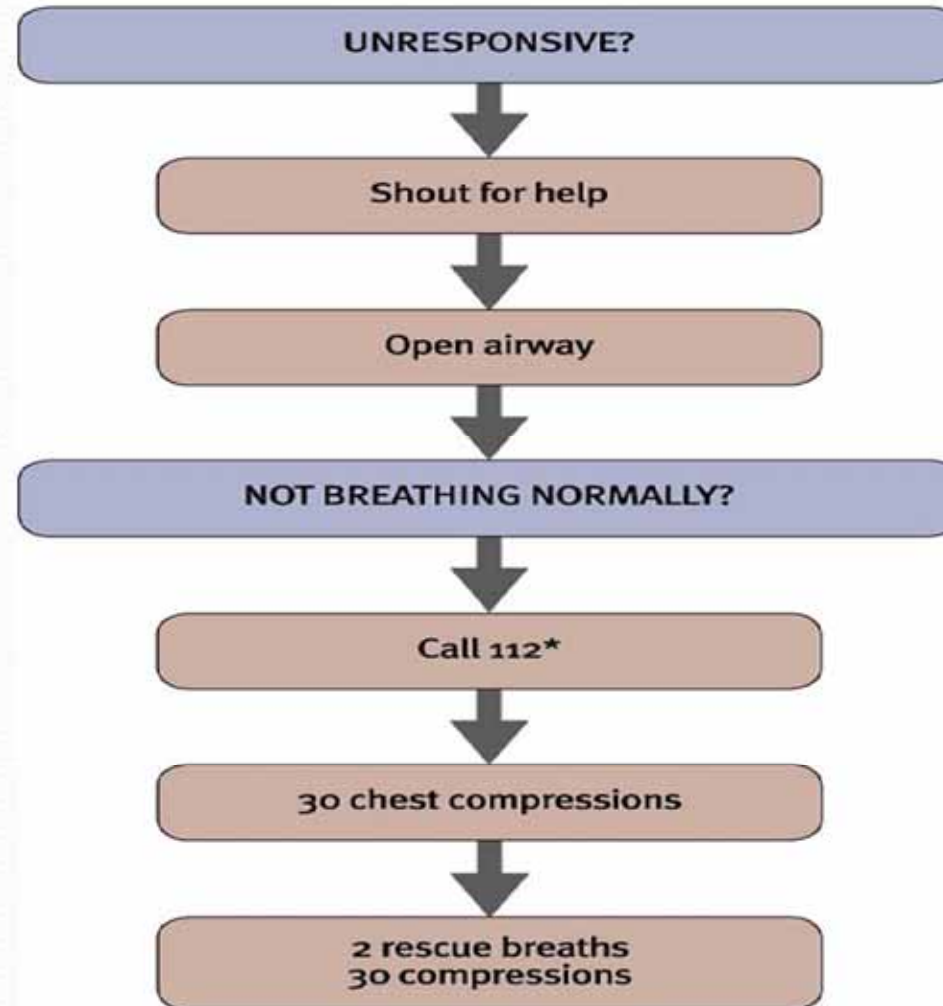


Rhythm Strip 5. Asystole





## Adult Basic Life Support



\*or national emergency number

## Automated External Defibrillation Algorithm

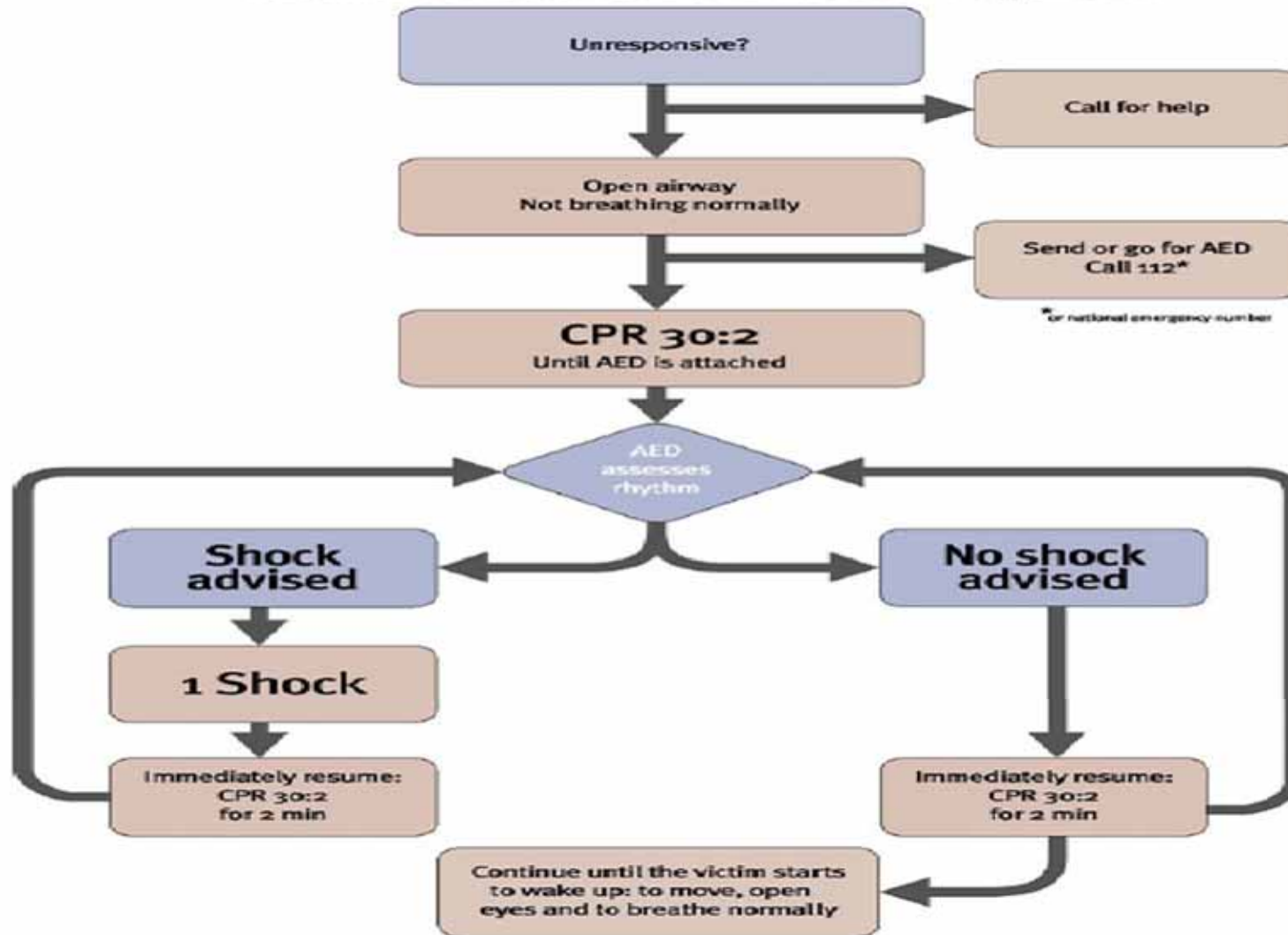


Fig. 1.4. AED algorithm. © 2010 ERC.

## Tachycardia Algorithm (with pulse)

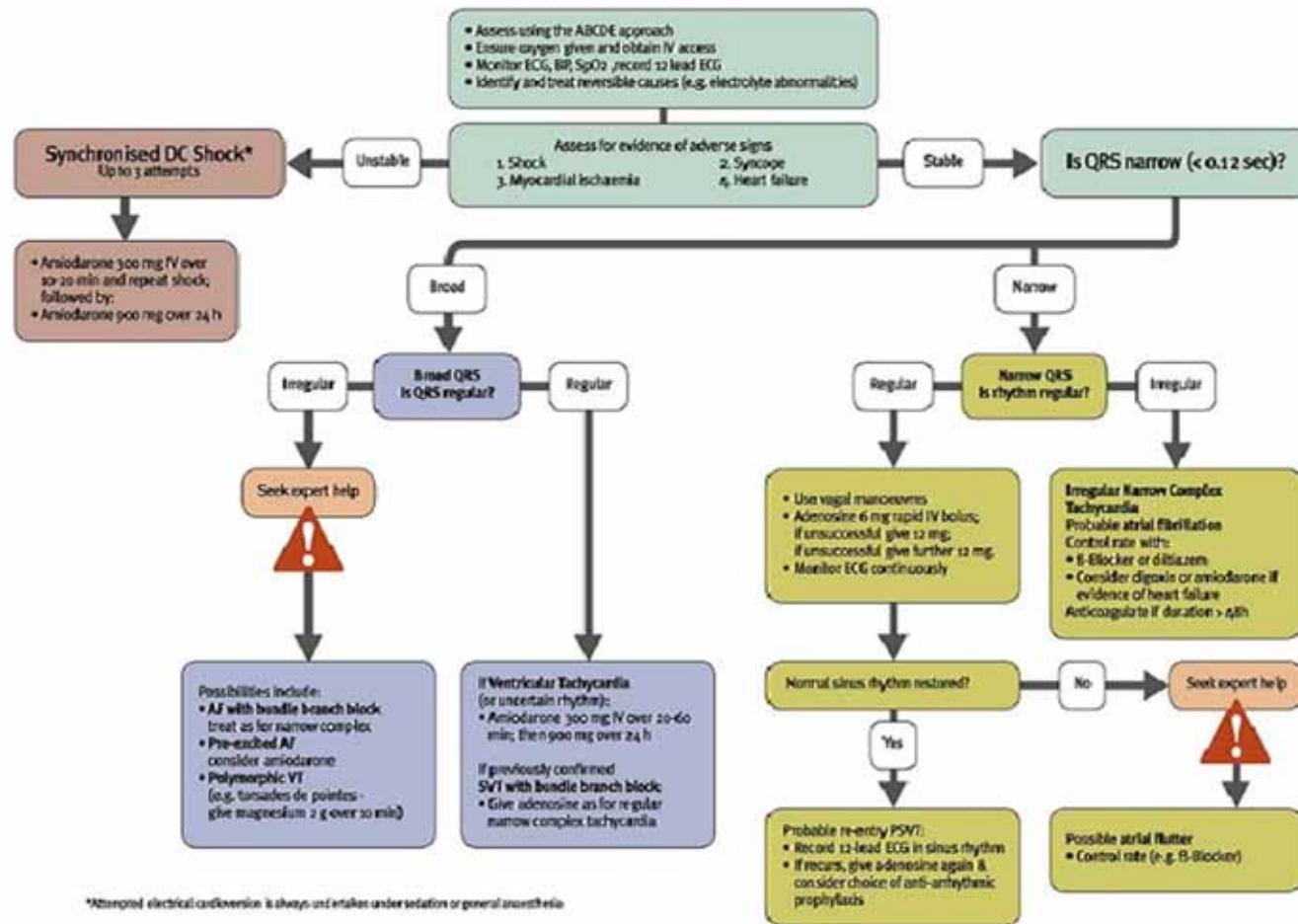


Fig. 1.2. Tachycardia algorithm. © 2010 ERC.



## Bradycardia Algorithm

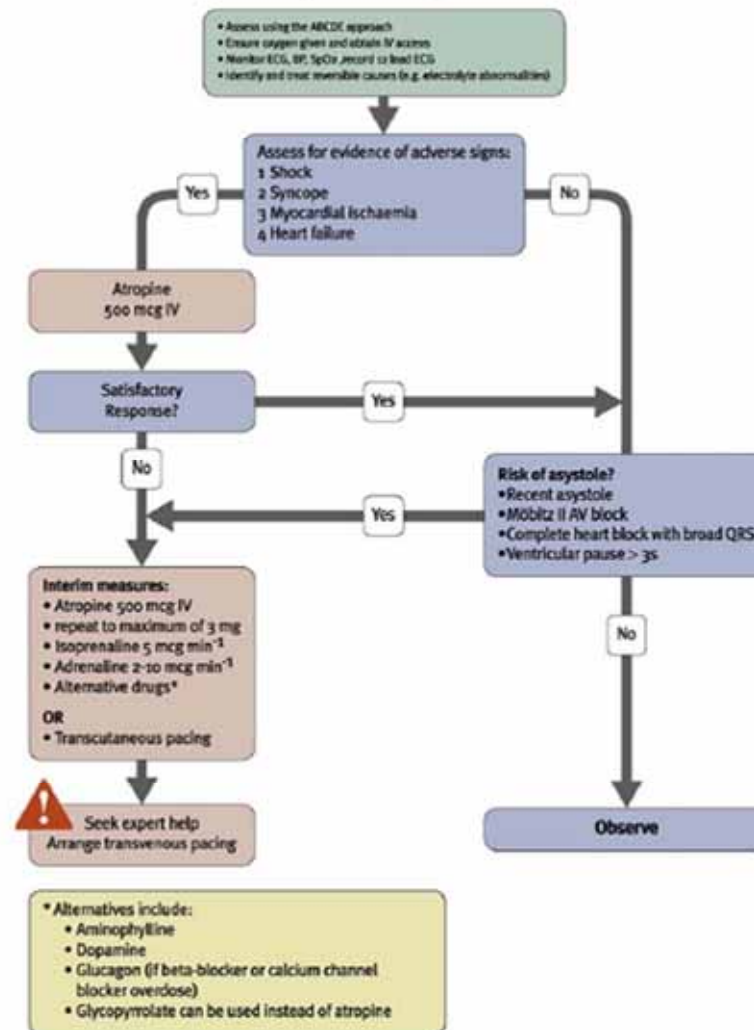
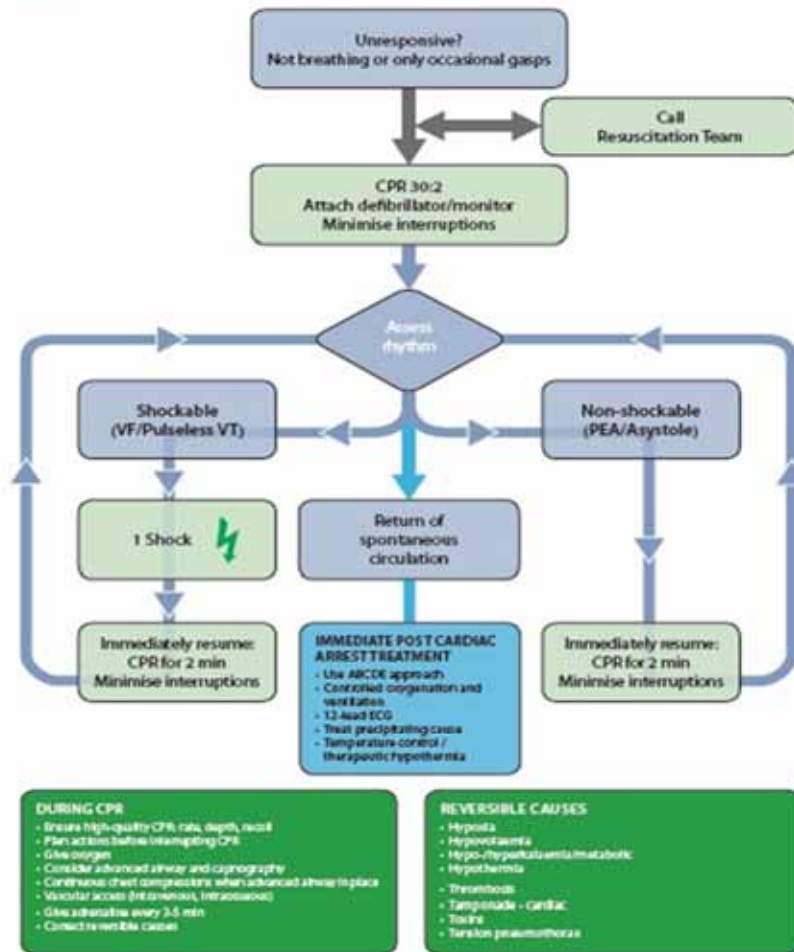


Fig. 1.8. Bradycardia algorithm. © 2010 ERC.



## Advanced Life Support Universal Algorithm



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# **Basic Life Support & Automated External Defibrillation Course**





## OBJECTIVES

- At the end of this course participants should be able to demonstrate:
  - How to assess the collapsed victim.
  - How to perform chest compression and rescue breathing.
  - How to operate an automated external defibrillator safely.
  - How to place an unconscious breathing victim in the recovery position.

## BACKGROUND

- Approximately 700,000 cardiac arrests per year in Europe
- Survival to hospital discharge presently approximately 5-10%
- Bystander CPR vital intervention before arrival of emergency services
- Early resuscitation and prompt defibrillation (within 1-2 minutes) can result in >60% survival



# CHAIN OF SURVIVAL







**Approach safely**

**Check response**

**Shout for help**

**Open airway**

**Check breathing**

**Call 112**

**30 chest compressions**

**2 rescue breaths**



## APPROACH SAFELY!

Scene

Rescuer

Victim

Bystanders

### Approach safely

Check response

Shout for help

Open airway

Check breathing

Call 112

30 chest compressions

2 rescue breaths



## CHECK RESPONSE



Approach safely

**Check response**

Shout for help

Open airway

Check breathing

Call 112

30 chest compressions

2 rescue breaths



## CHECK RESPONSE



Shake shoulders gently

Ask “Are you all right?”

If he responds

- Leave as you find him.
- Find out what is wrong.
- Reassess regularly.



# SHOUT FOR HELP



Approach safely

Check response

**Shout for help**

Open airway

Check breathing

Call 112

30 chest compressions

2 rescue breaths



## OPEN AIRWAY



©LRC

Approach safely

Check response

Shout for help

**Open airway**

Check breathing

Call 112

30 chest compressions

2 rescue breaths



# CHECK BREATHING



Approach safely

Check response

Shout for help

Open airway

**Check breathing**

Call 112

30 chest compressions

2 rescue breaths



## CHECK BREATHING



- Look, listen and feel for **NORMAL** breathing
- Do not confuse agonal breathing with **NORMAL** breathing

## AGONAL BREATHING

- Occurs shortly after the heart stops in up to 40% of cardiac arrests
- Described as barely, heavy, noisy or gasping breathing
- Recognise as a sign of cardiac arrest





**Approach safely**

**Check response**

**Shout for help**

**Open airway**

**Check breathing**

**Call 112**

**30 chest compressions**

**2 rescue breaths**



## 30 CHEST COMPRESSIONS



Approach safely

Check response

Shout for help

Open airway

Check breathing

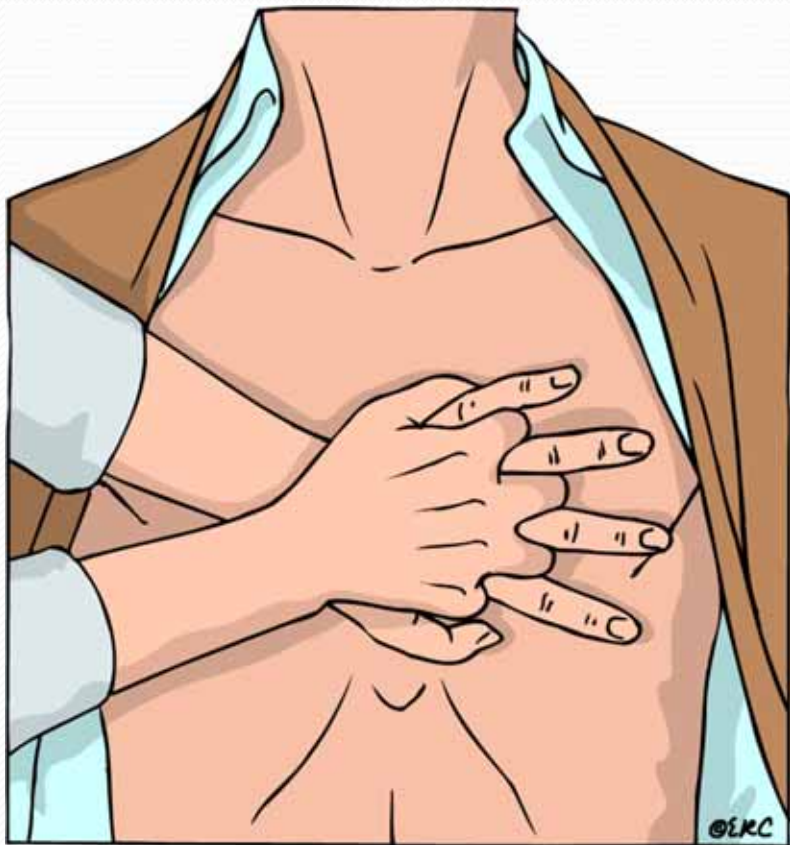
Call 112

**30 chest compressions**

2 rescue breaths



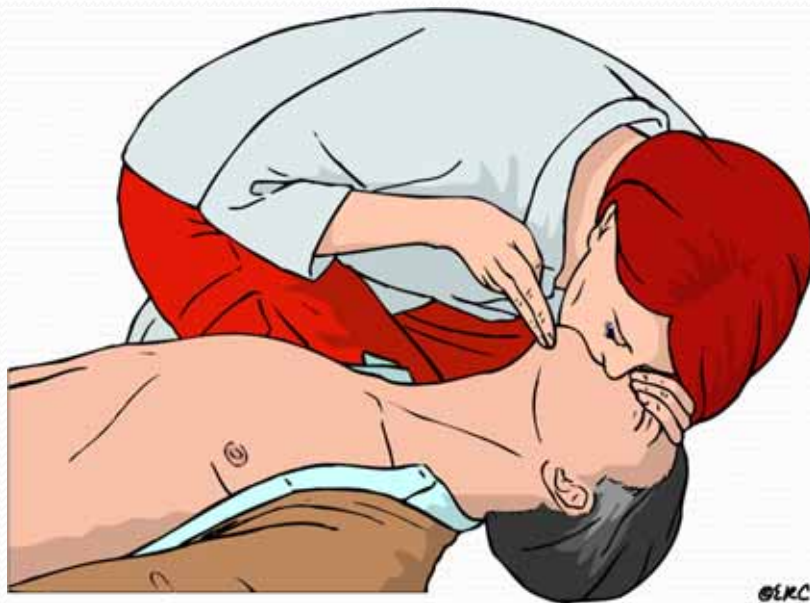
## CHEST COMPRESSIONS



- Place the heel of one hand in the centre of the chest
- Place other hand on top
- Interlock fingers
- Compress the chest
  - Rate  $100 \text{ min}^{-1}$
  - Depth 4-5 cm
  - Equal compression : relaxation
- When possible change CPR operator every 2 min



# RESCUE BREATHS



Approach safely

Check response

Shout for help

Open airway

Check breathing

Call 112

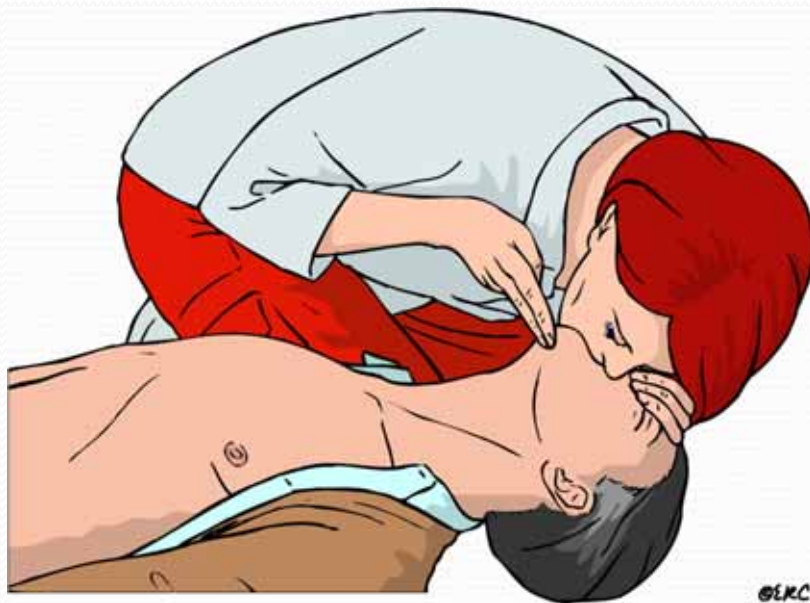
30 chest compressions

2 rescue breaths



## RESCUE BREATHS

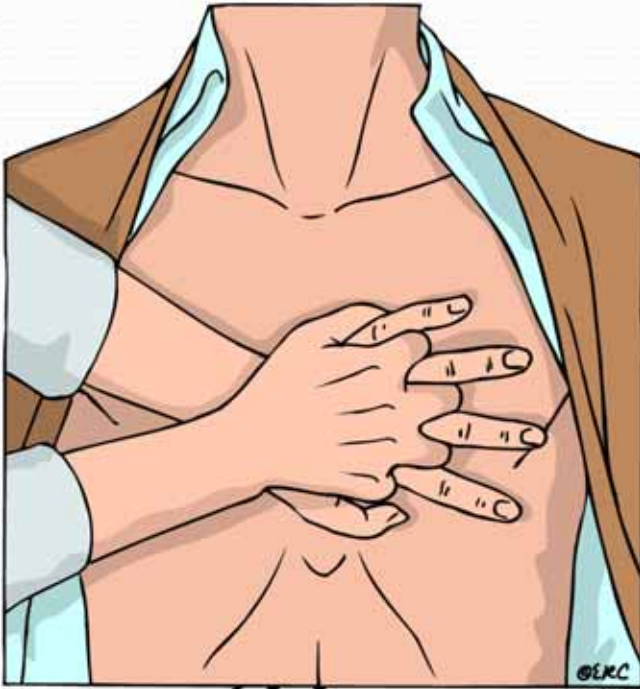
- Pinch the nose
- Take a normal breath
- Place lips over mouth
- Blow until the chest rises
- Take about 1 second
- Allow chest to fall
- Repeat



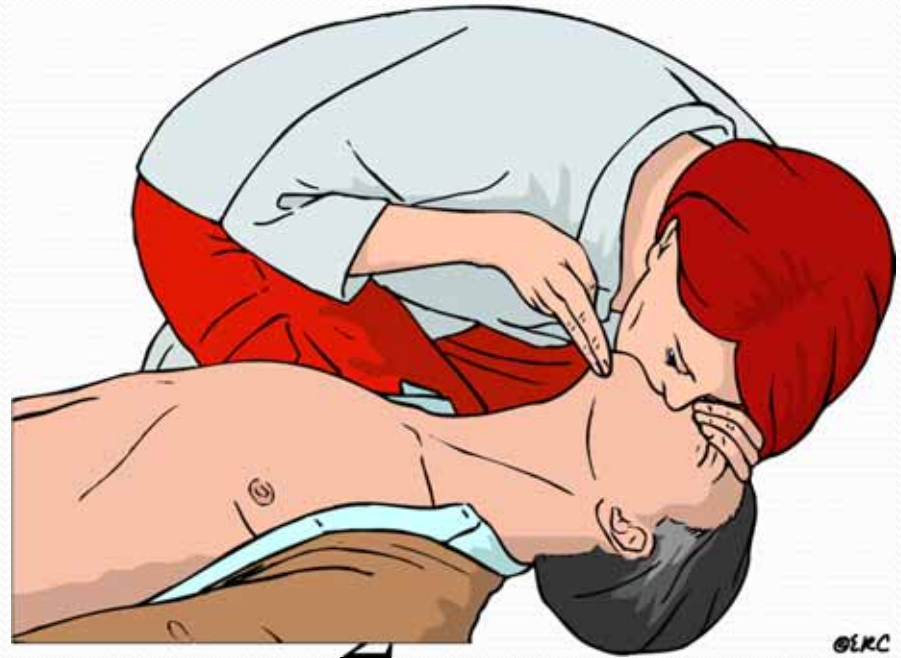
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## CONTINUE CPR



30



2



**Approach safely**

**Check response**

**Shout for help**

**Open airway**

**Check breathing**

**Call 112**

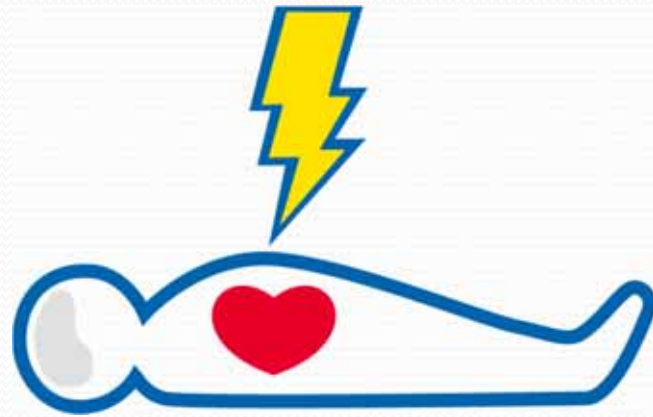
**30 chest compressions**

**2 rescue breaths**





# DEFIBRILLATION





**Approach safely**

**Check response**

**Shout for help**

**Open airway**

**Check breathing**

**Call 112**

**Attach AED**

**Follow voice prompts**



## SWITCH ON AED



- Some AEDs will automatically switch themselves on when the lid is opened

## ATTACH PADS TO CASUALTY'S BARE CHEST



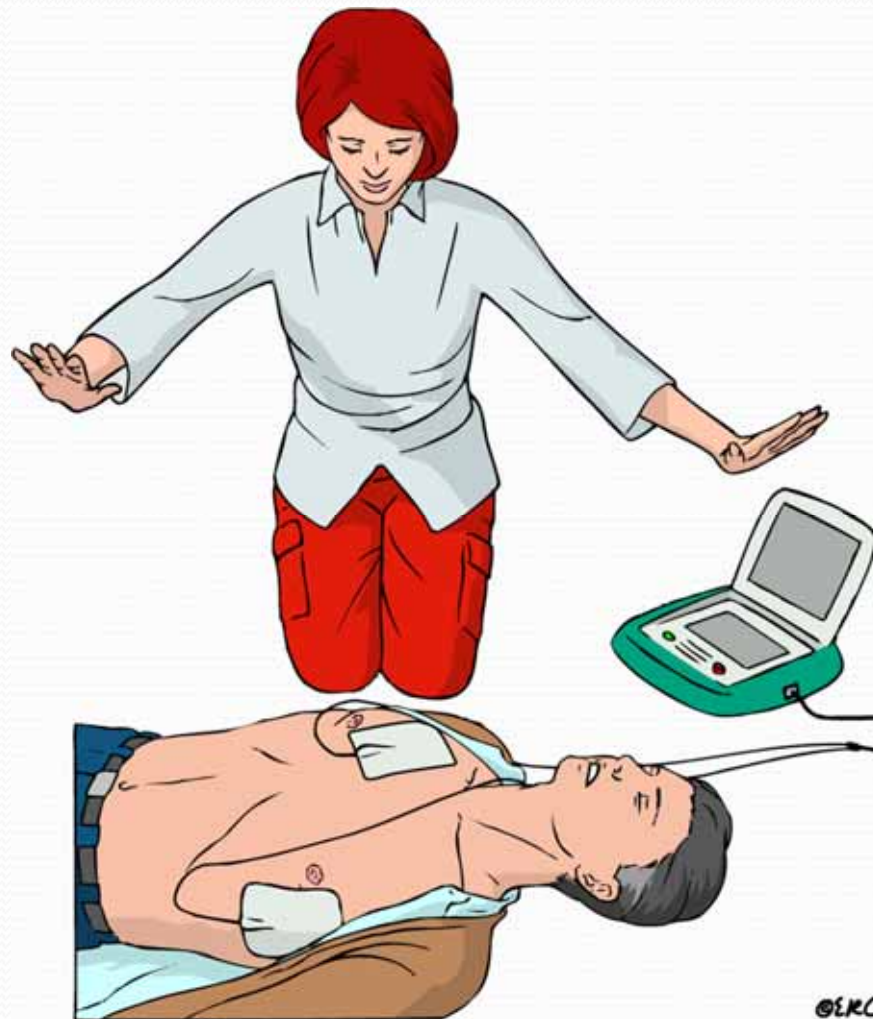
©ERC



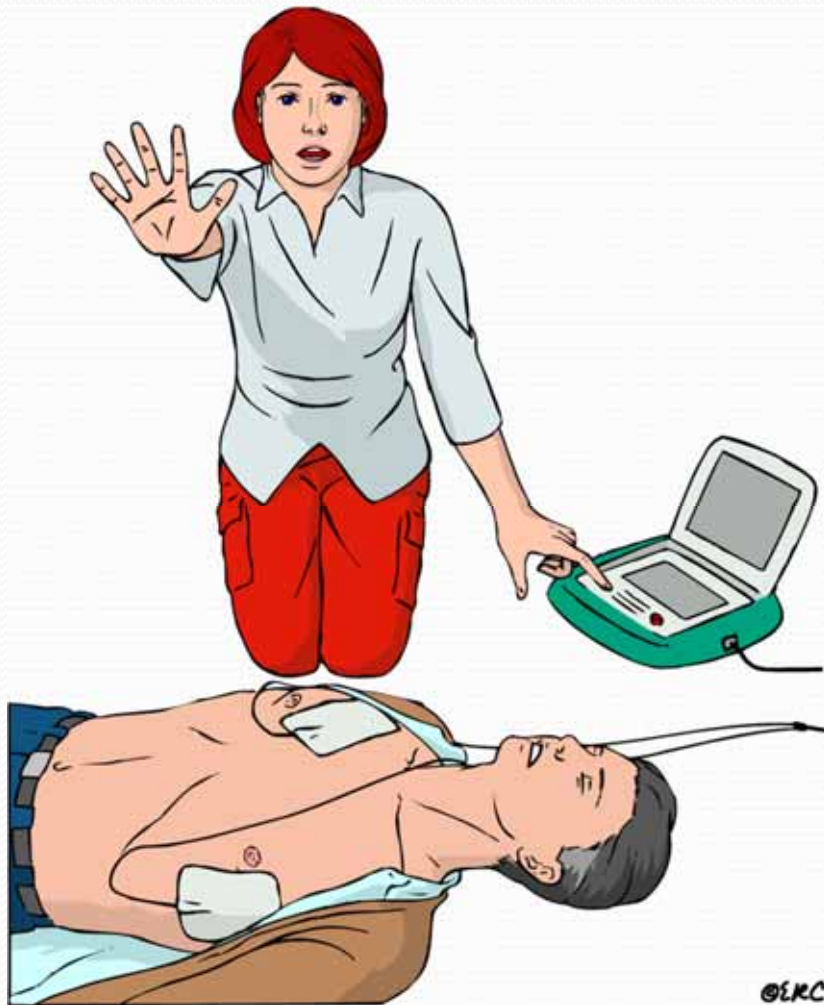
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# ANALYSING RHYTHM DO NOT TOUCH VICTIM



## SHOCK INDICATED



- Stand clear
- Deliver shock



# SHOCK DELIVERED FOLLOW AED INSTRUCTIONS



30



2

**NO SHOCK ADVISED  
FOLLOW AED INSTRUCTIONS**



30



2



**IF VICTIM STARTS TO BREATHE  
NORMALLY PLACE IN RECOVERY  
POSITION**





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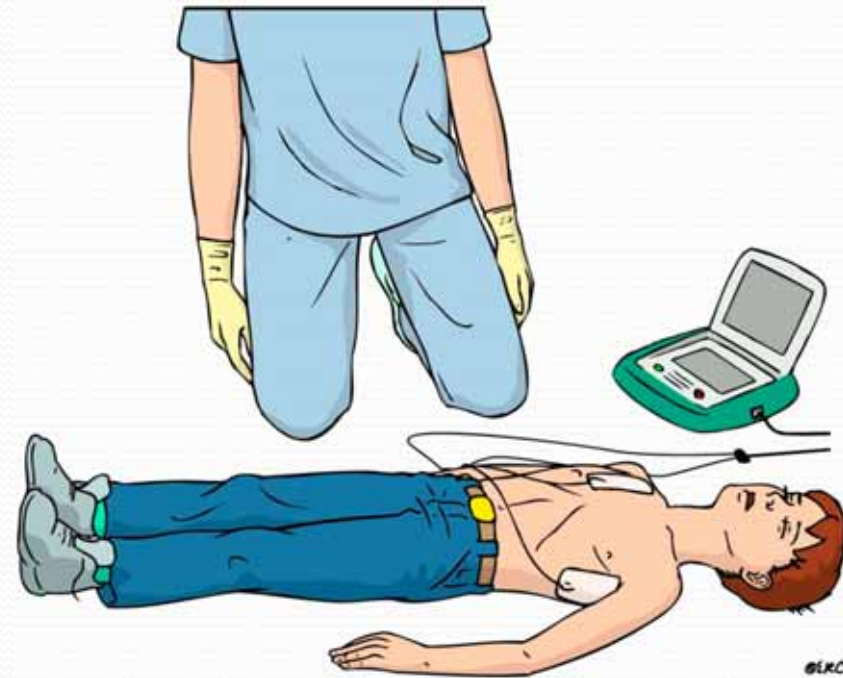
## CPR IN CHILDREN

- Adult CPR techniques can be used on children
- Compressions  $\frac{1}{3}$  of the depth of the chest

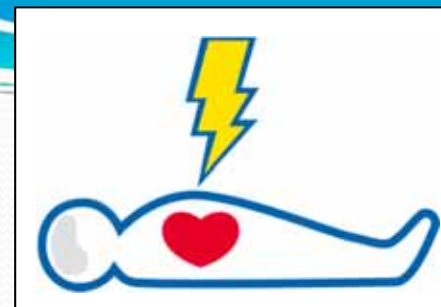


# AED IN CHILDREN

- Age > 8 years
  - use adult AED
- Age 1-8 years
  - use paediatric pads / settings if available (otherwise use adult mode)
- Age < 1 year
  - use only if manufacturer instructions indicate it is safe







**Approach safely**

**Check response**

**Shout for help**

**Open airway**

**Check breathing**

**Call 112**

**30 chest compressions**

**2 rescue breaths**

**Approach safely**

**Check response**

**Shout for help**

**Open airway**

**Check breathing**

**Call 112**

**Attach AED**

**Follow voice prompts**

## Keynotes

1. Cardiac arrest: most urgent of all emergencies
2. Early recognition, early CPR, early Defib.
3. High quality CPR. Cardiac output at best is 30%
4. More emphasis on chest compressions than ventilation
5. CC:5cm, Rate:100/min, Ratio: 30:2
6. Minimise pause for Defib, airway, IV
7. Use drugs either IV (20ml NS flush) or IO

Contd



## Keynotes

8. Special area in general wards
9. Cardiac arrest team     M~~U~~ → RRT, CCOT
10. Atropine, Vasopressin, Lidocaine
11. Prevention of cardiac arrest