Cardio Pulmonary Resuscitation

Death

Prior to the advent of mechanical respiration,

- **Death** was defined as:
  - The cessation of circulation and breathing

- **Death = Brain Stem Death**
  - *'Irreversible loss of the capacity for consciousness, combined with*
  - *irreversible loss of the capacity to breathe'*

Brain Death :

- **Defined as** *: irreversible dysfunction of brain and brain stem*
- 4 things necessary to stabilize before the diagnosis
- **stable vital sign
- **core body temp >34
- **normal electrolytes &toxicology screen free
- **normal Pco2 level 35-45

VITAL SIGNS

- Respiratory rate 12-18 ,
- TRUE BETWEEN 12 YEARS TO 65 Y.
- >20-25 Breath/ mint considered tachypnea .
- Baby, children < 12 years and adults >65 y have higher respiratory rate

Pulse rate

- Pulse rate 60-100 beat / mint
- Consider true STRARTED from 10 YEARS and above.
- AVAREGE 80 beats /min
- Considered tachycardia if > 100
- Considered bradycardia < 60

Temperature

- Temperature in adults :
- 36.5 - 37.2 degree c Orally. (37)
- Rectally 0.5 c higher 0.5-0.7
- Axillary 0.5 c lower 0.4-0.5
- Baby and children within upper normal
- > 65y within lower normal
- Increased 1.1 degree c considered hyperthermia in adults.
- 0.5 degree in children is significant.
- Hypothermia below 35 C core body T.

Blood Pressure
S 100-120 ,D 60-80

Blood Pressure Stages

Blood Pressure Category	Systolic mm Hg (upper #)		Diastolic mm Hg (lower #)
Normal	less than 120	and	less than 80
Elevated	120-129	and	less than 80
High Blood Pressure (Hypertension) Stage 1	130-139	or	80-89
High Blood Pressure (Hypertension) Stage 2	140 or higher	or	90 or higher
Hypertensive Crisis (Seek Emergency Care)	higher than 180	and/or	higher than 120

Source: American Heart Association

- Hypotension: Any blood pressure that is below the normal expected for an individual in a given environment WITH S&S of hypoperfusion.
- Old definition MAP <60
- MAP D + 1/3 (S-D) normally 70-110, OR >60
- Shock : hypoperfusion and systolic blood pressure below 90.

Resuscitation tasks

- First Aid
- CPR : CARDIO PULMONARY RESUSCITATION
- BLS : Basic life support
- ALS : advanced life support
- ACS : advanced cardiac life support

- Pediatric BLS & ALS
- Neonatal Resuscitation

First aid

- **Definition:**
- … is the immediate care given to an injured or suddenly ill person.

CardioPulmonary Resuscitation

Definition:

CPR is an emergency first-aid procedure that is used to maintain respiration and blood circulation in a person, whose breathing and heartbeats have suddenly stopped,

(one or more vital functions failed).

CardioPulmonary Resuscitation

Three basic vital functions:

- **Breathing**
- **Circulation**
- **Consciousness**

Cause of cardiac arrest and emergency system activation

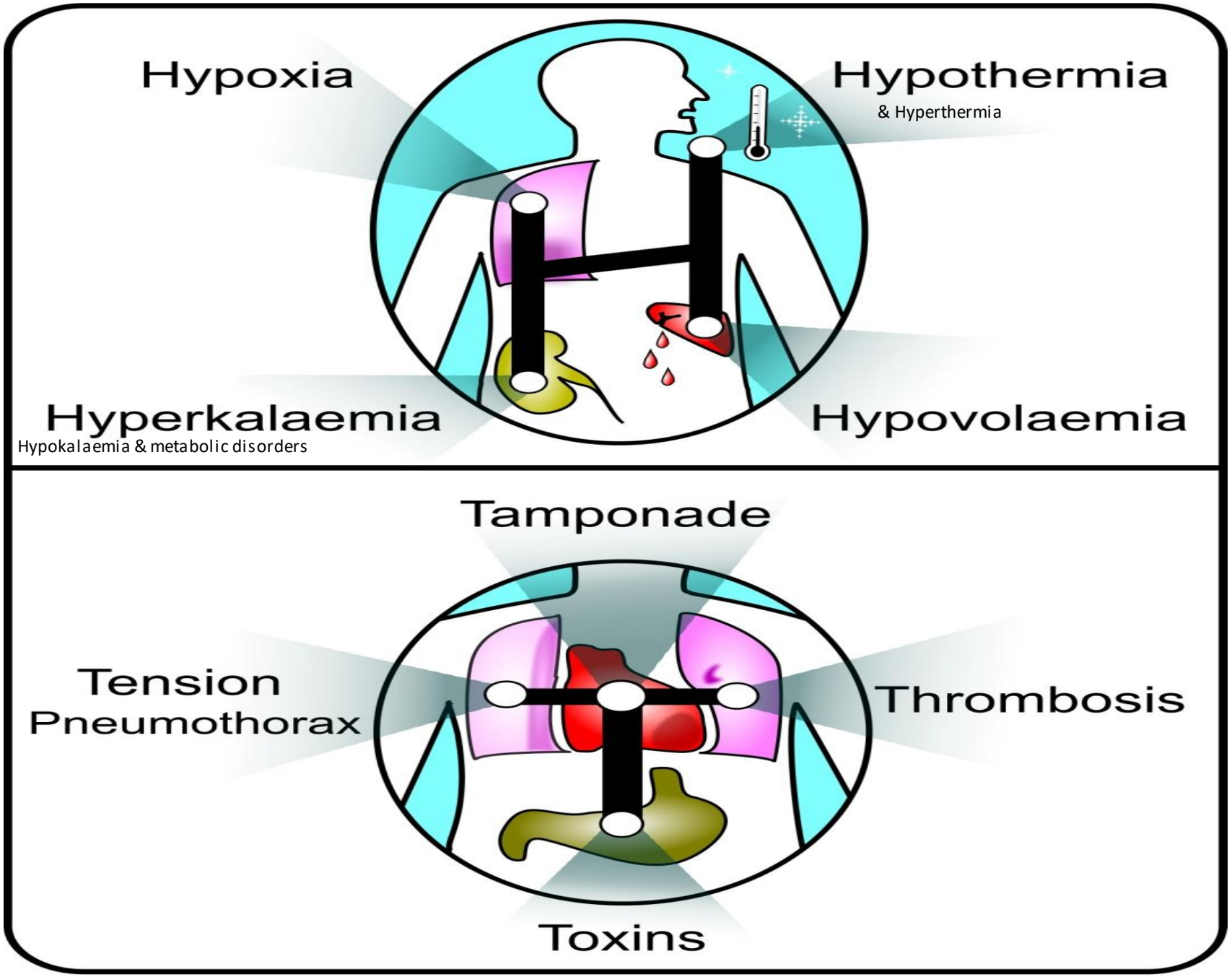
Adults

- **Ischemic heart disease - AMI- with/or ventricular fibrillation (> 80%)**

Children

- **Suffocation or choking with hypoxemia or asphyxia.**

  Ventricular fibrillation is rare in children (only 5-8%)


Hypoxia
Hypothermia
& Hyperthermia
Hyperkalaemia
Hypokalaemia & metabolic disorders
Hypovolaemia
Tamponade
Tension
Pneumothorax
Thrombosis
Toxins

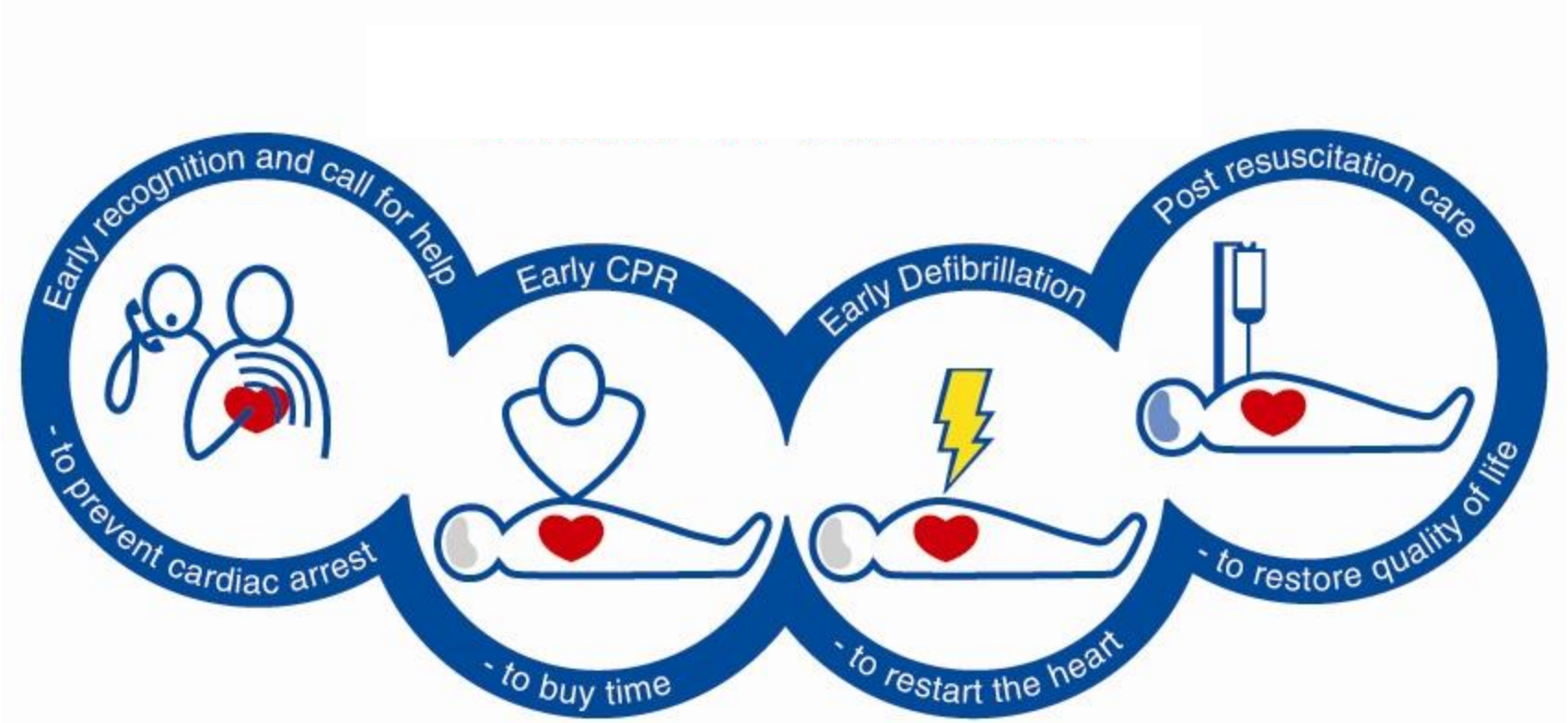
Signs of cardiac arrest

1. **Unconsciousness** in several seconds
2. **Respiratory arrest** (apnea) or the last **gasps** (1-3 minutes after cardiac arrest)
3. **Pulse-less on large (major) arteries**
   (carotid or femoral artery)
4. **Changed general appearance**
   (colour changes, face changes…)
5. Pupils dilation (mydriasis) – not reliable

Signs of cardiac arrest

1. Unconsciousness
2. No reactivity
3. Absence of normal breathing and no pulse

Chain of survival




Basic Life
Support

FIRST: DO”

- SECURE MY SELF
- CHECK FOR UNRESPONSIVNESS
- CALL 911 IN ADULTS.
- TRANSFERE THE PATIENT TO SAFE PLACE IF NEEDED.

SECOND :
CHECK BREATHING

- **Look, listen and feel** for NORMAL breathing
- IN LESS THAN 10 SEC.
- + check carotid pulse

- Do not confuse agonal breathing with NORMAL breathing
- AND DO AIRWAY OPENING.

AGONAL(gasps) 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

Then start CPR (CAP)

Airway

Breathing

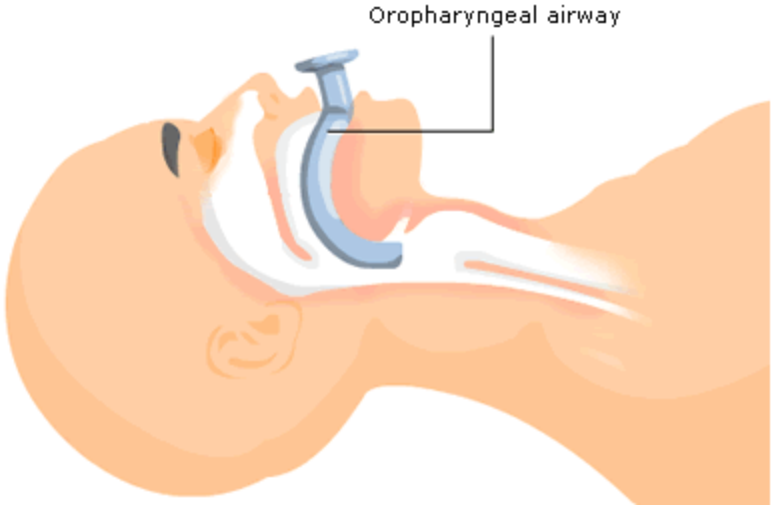
Circulation **(CAB)**

A) AIRWAY OPENING

- A clear airway must be quickly established with the head tilt-jaw thrust or head tilt-chin lift maneuver and then maintained.
- Suction should be used to aspirate vomit.
- Badly fitting dentures and other foreign bodies should be removed from the mouth, and an airway should be inserted.
- These procedures should be performed with the patient inclined laterally .

Blocked Airway

Open Airway



B) BREATHING PROVIDING

- If the patient is not breathing adequately, intermittent positive pressure ventilation should be started once the airway has been cleared;
- mouth to mouth, mouth to nose, or mouth to airway device.
- ventilation should be carried out until a self inflating bag and mask are available.
- Ventilation should then be continued with 100% oxygen and a reservoir bag.
- Because of the increased risk of regurgitation and pulmonary aspiration of gastric contents cricoid pressure should be applied until the airway has been protected by a cuffed tracheal tube

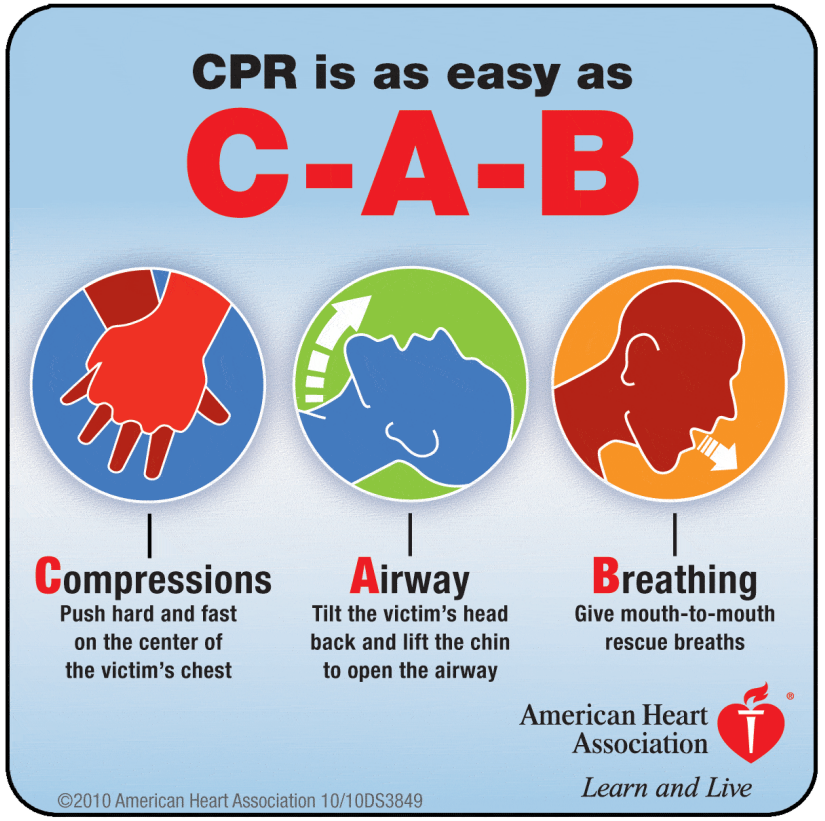
Self-infalting bag

Capacity 1500 ml
1 way valve
Volume controlled by compression

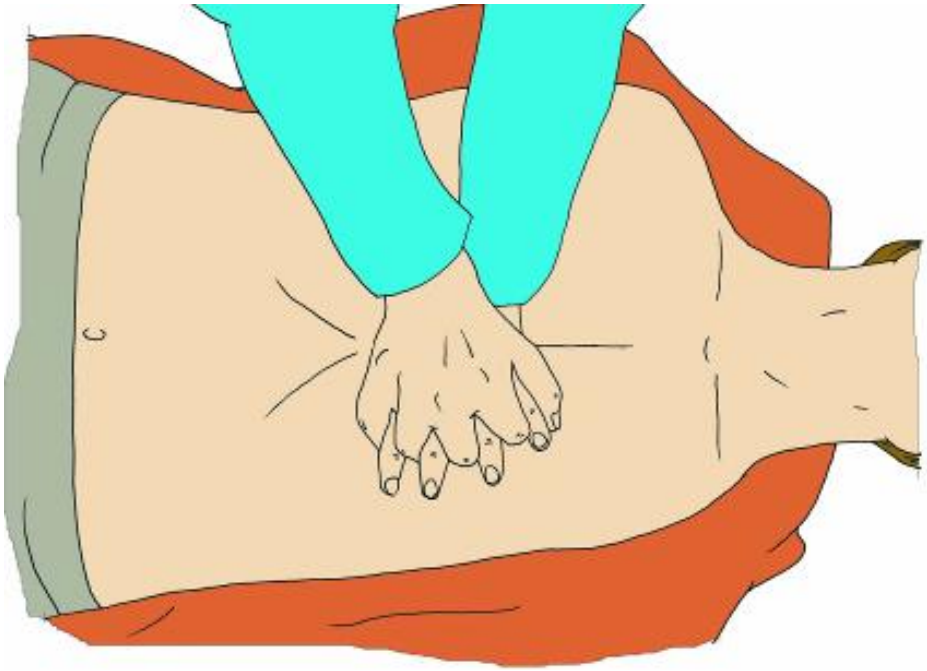
Breathing by atmospheric air
Oxygene source - conection
Oxygene reservoir – 100% O2

C) CHEST COMPRESSION

- Circulatory arrest is diagnosed by the absence of a palpable pulse in a large artery (carotid).
- Chest compressions are given at the standard rate and ratio of 30:2.
- More than 100 compressions up to 120/mint.
- More than 2 inch. 5 cm depth.
- Non interrupted after 2nd rescue present or intubation secured.


CPR is as easy as
C-A-B
Compressions
Push hard and fast on the center of the victim's chest
Airway
Tilt the victim's head back and lift the chin to open the airway
Breathing
Give mouth-to-mouth rescue breaths
American Heart Association
Learn and Live
©2010 American Heart Association 10/10DS3849

Continue CPR



30 : 2

Outcome after CPR

Start as soon as possible :

- **1 minute - survival - 90%,**
- **5 minutes - survival - 50%,**
- **7 minutes - survival - 30%**
- **10 - 12 minutes - survival - 2 – 5%.**

CPR outcome

Cells of the brain cortex

- Most sensitive for the stop of pefusion and oxygenation

Without perfusion and oxygenation

➔ **irreversibly damaged after 3-5 minutes**

- In first **4 minutes** – brain damage is unlikely, if CPR started
- **4 – 6 minutes** – brain damage possible
- **6 – 10 minutes** – brain damage probable
- **> 10 minutes** – severe brain damage certain

Basic Life Support Chart

DANGER

Ensure the area is safe for yourself, others and the patient.

RESPONSE

Check the response-ask name-squeeze shoulders.

No Response

Response
*Make comfortable
*Monitor response

SEND HELP

Call for an ambulance or ask another person to make the call.

AIRWAY

Open mouth-if foreign material present, place in recovery position.
Clear airway with fingers.

BREATHING

Check for breathing- look,listen,feel

Not normal breathing
Start CPR

Normal breathing
*Place in recovery position
*Monitor breathing

CPR

Start CPR- 30 chest compressions:2 breaths.

Continue CPR until help arrives or patient recovers.

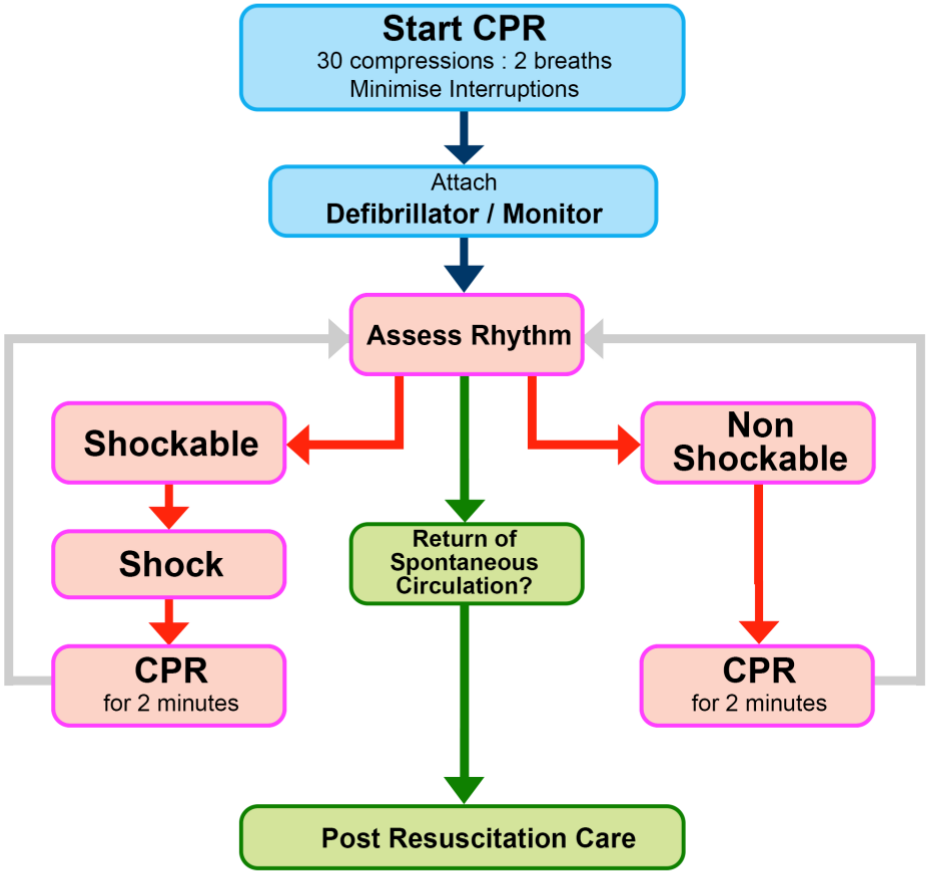
DEFIBRILLATION

Apply defibrillator if available and follow voice prompts.

PSP216

Adult ALS algorithm

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

January 2016

AUSTRALIAN RESUSCITATION COUNCIL

NEW ZEALAND Resuscitation Council WHAKAHAUORA AOTEAROA

Thank you


Save a Life.
Learn Compression-Only CPR
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AMR World CPR Challenge
Learn to Save a Life
AMR