Cardiac Emergencies

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Learning Objectives

At the end of this module, you should be able to:

- Recognize the signs & symptoms of angina & Heart attack
- Identify the aims and the precautions which have to be taken during the treatment
- List the steps of First Aid for angina and heart attack victims
- Recoginse the victims in cardiac arrest
- Perform Adult CPR & AED
- Perform Child and Infant CPR & AED

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Learning Unit Content

1) Learning outcome
2) Introduction Cardiac Emergencies
3) Heart function at a glance
4) Angina
5) Heart Attack
6) Cardiac Arrest

- Adult CPR & AED
- Child and Infant CPR & AED

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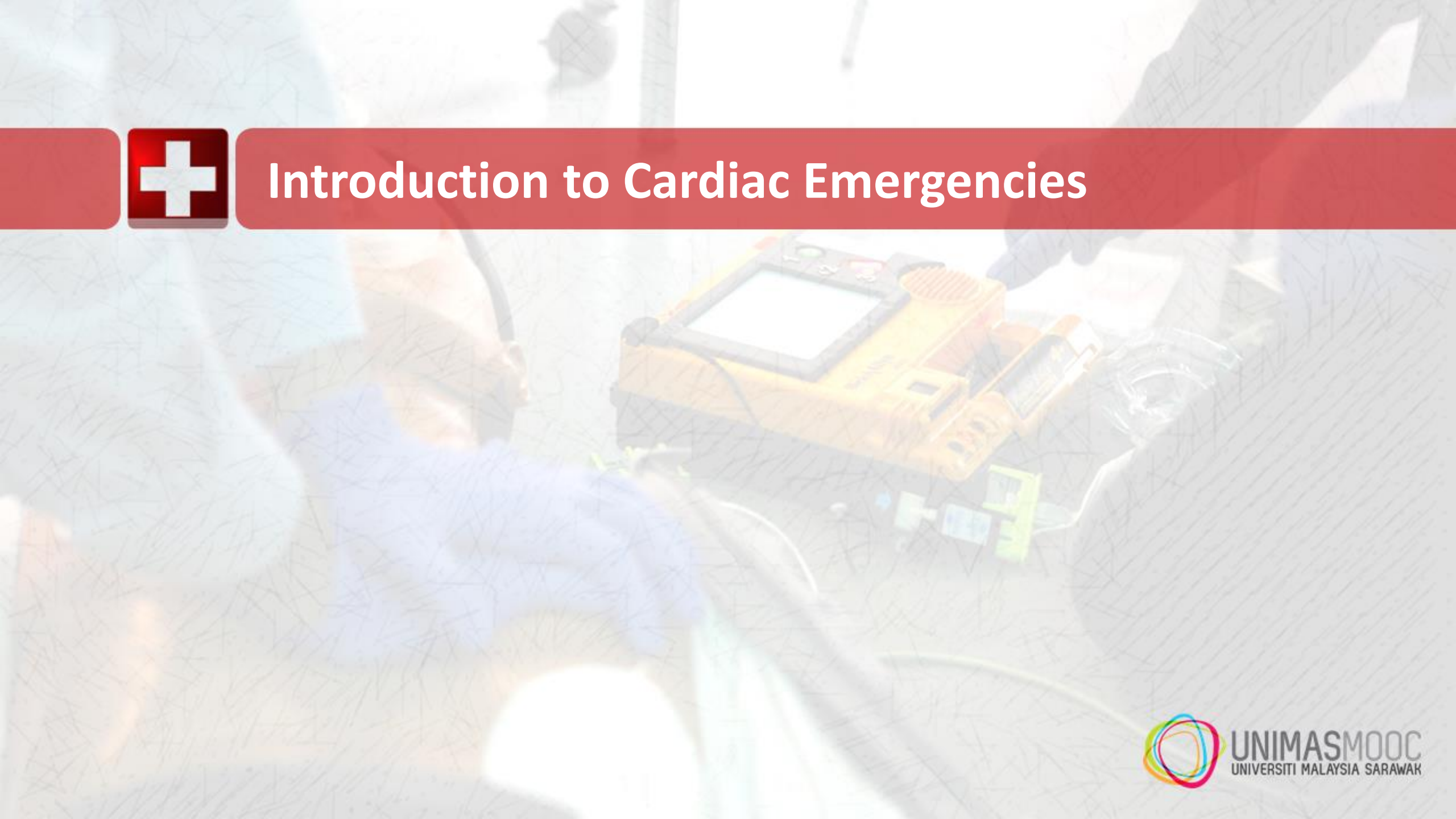
Introduction to Cardiac Emergencies



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Introduction Cardiac Emergencies

- Cardiac emergencies is life threatening disorders that must be recognized immediately to avoid delay in treatment and minimize morbidity and mortality.

- Victims may present with severe chest pain, abdominal pain, sweating or even loss of consciousness i.e. cardiac arrest

Introduction Cardiac Emergencies

- This module provides and teaches;

- the steps of recognition, approach and treatment of victims with angina or heart attack.

- the steps of adult CPR & AED as well as Child & infant CPR

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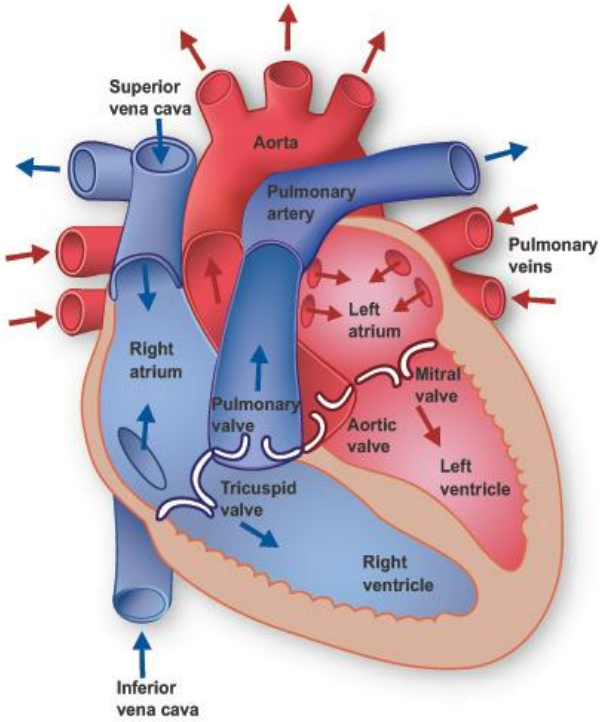
Heart Function at a Glance

- Heart is a muscular organ pumps the blood around the body and then into the lungs to pick up oxygen.
- It is made up of 2 atrium and 2 ventricles
- Coronary blood vessels supply the heart muscle with oxygen and nutrients
- The heart pumps blood by muscular contractions called “heartbeat”,

which are controlled by electrical impulses generated in the heart.



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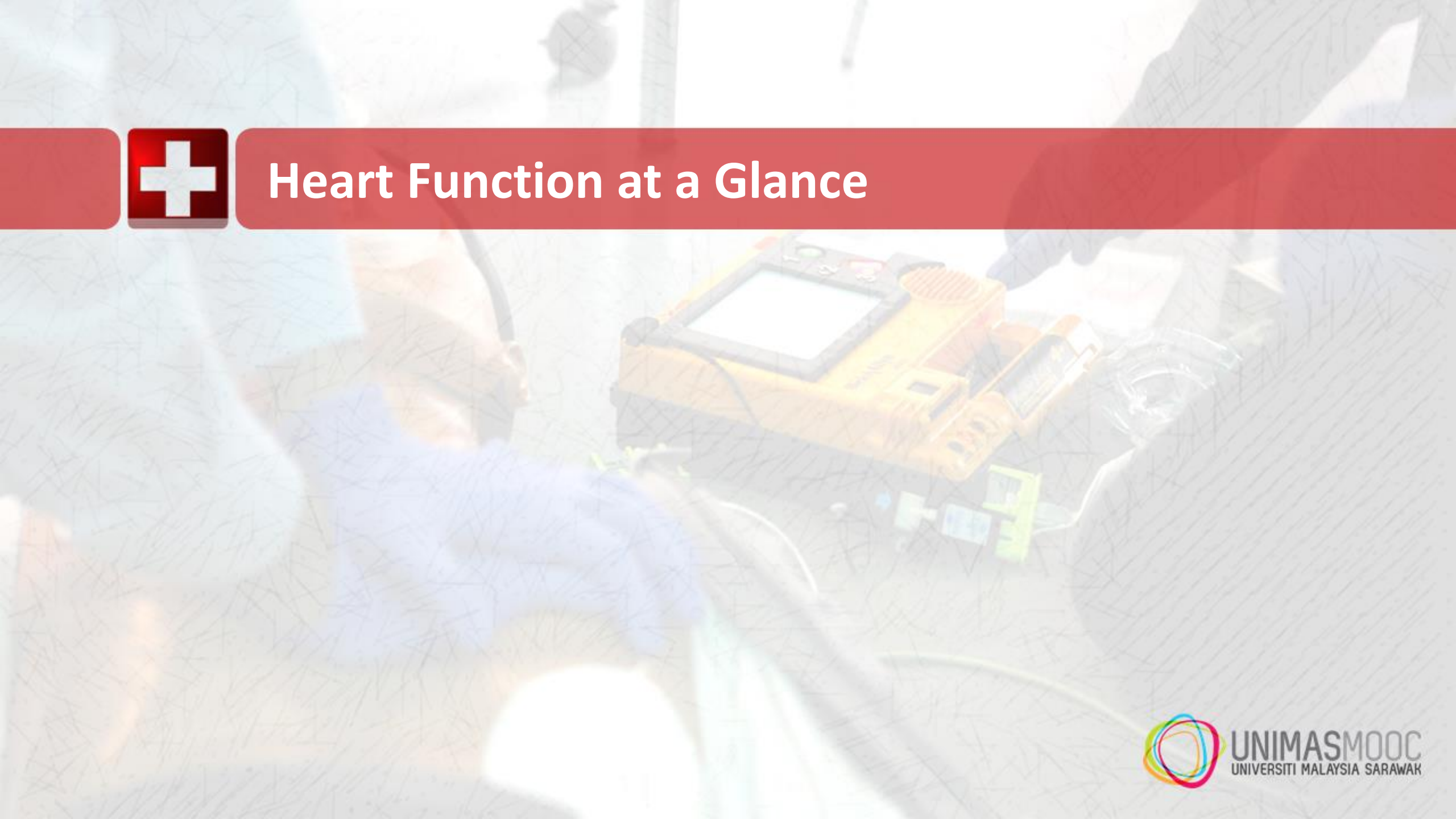
Heart Function at a Glance



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Heart functions at a glance

- Each heartbeat has Two phases:

➢ Diastole: when the blood enters the heart. Oxygenated blood from the lungs and deoxygenated blood flows from other body organs/ tissues.

➢ Systole : when the blood exits the heart.

- Atrial Systole: The two atria contact and the valves between the atria and ventricles open so the blood flows into the ventricles
- Ventricular Systole: the ventricles contact forcing the blood to the lungs to collect oxygen or to the rest of the body to provide oxygen and other nutrients

Heart Attack

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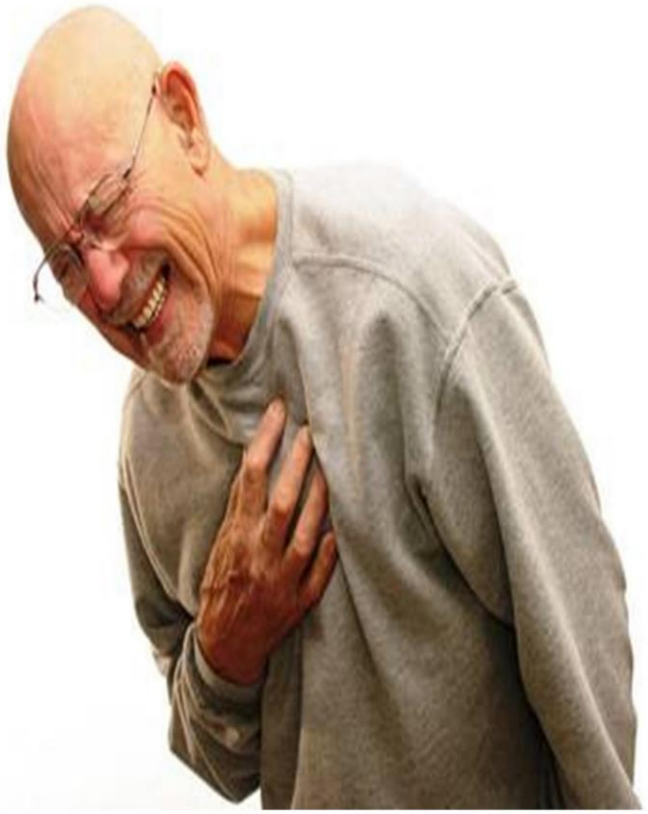
Heart Attack

- **Introduction:**

- A heart attack is most commonly caused by sudden obstruction of the blood supply to part of heart muscle e.g. clot in the coronary artery.it is also called “Myocardial Infarction”

- The main risk is that the heart may stop beating i.e. Cardiac arrest



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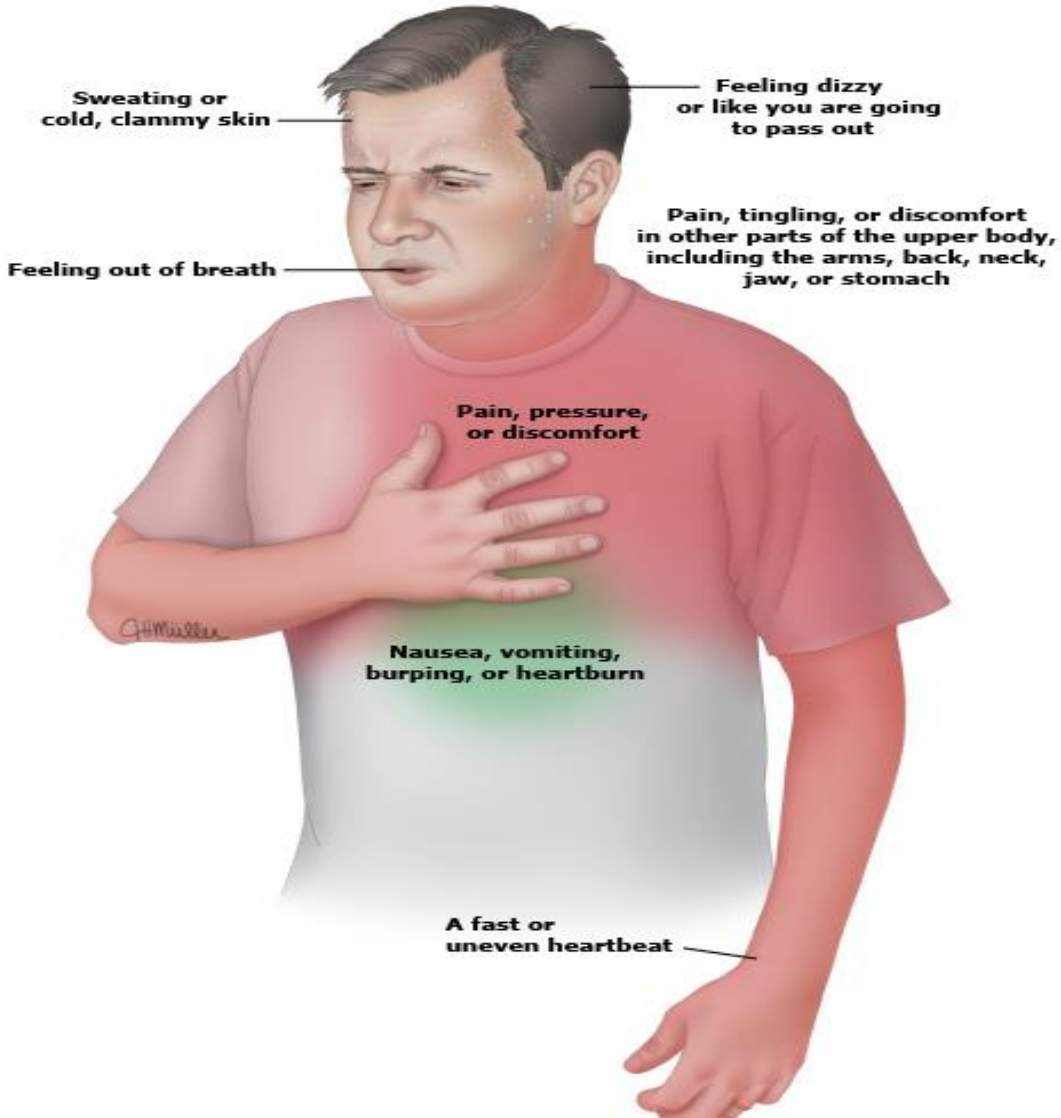
Heart Attack

- **Recognition :**



Heart Attack

- **Your aim :**
  - to ease the strain on the heart by insuring the casualty rests
  - To call for urgent medical help with delay
- **Cautions :**
  - if the casualty loses consciousness , follow the steps of checking unconscious victim
  - Do not give the victim “ aspirin” if you know that he is allergic to it

Heart Attack

- **First Aid Tips:**

1. Make the casualty as confortable as possible to reduce the strain on the heart. A half sitting position, with his head and shoulders supported and his knees bend is often the best.
2. Call 999 to inform that you have a heart attack victim and you need an urgent help.
3. Assist the victim to take “Aspirin” if available
4. If the patient has his heart medication, help him to take it
5. Avoid undue stress by staying calm and monitor the victim closely from time to time.

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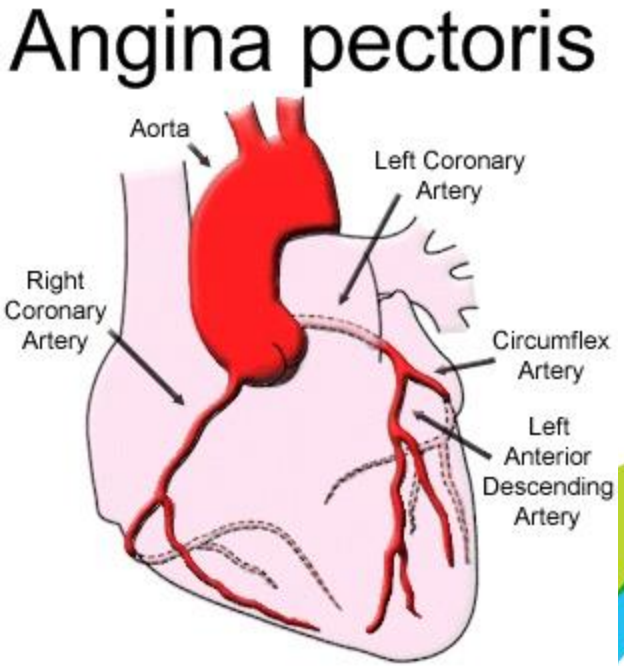
Angina

Angina

- **Introduction :**
  - The term angina means likely a constriction of the chest.
  - Angina occurs when coronary arteries that supply the heart muscle with blood become narrowed and cannot carry sufficient blood to meet increased demands during exertion or excitement.
  - The attack forces the victim to rest , the pain should ease soon afterwards



Angina

- **Recognition:**
  - central chest pain, which may spread to the jaw and down one or both arms
  - Usually it lasts 3 to 5 minutes
  - Pain easing with rest
  - Shortness of breath
  - Tiredness which is often sudden and extreme
  - Feeling of anxiety

Angina

- **Your aim :**
  - to ease the strain on the heart by insuring the casualty rests
  - To help the victim with any medications
  - To obtain medical help if necessary
- **Cautions :**
  - if the casualty loses consciousness , follow the steps of checking unconscious victim

Angina

- **First Aid Tips:**

1. help the casualty to stop what he is doing and sit down. Make sure he is confortable and reassure him, this should help the pain to ease
2. If the casualty has angina medications such as tablets or a aerosol spray, let him administer it himself or help him if needed

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Angina

- **First Aid Tips (cont.) :**

3. Encourage the casualty to rest and keep any bystanders away. The pain should ease within

few minutes

4. If the pain subsides after rest and with or without medications, the victim will usually be able to resume what he was doing. if he is concerned tell him to seek medical advice.

5. The pain persists follow " heart attack first

aid tips"

Cardiac Arrest

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Cardiac Arrest

Cardiac arrest is defined as the absence of an ineffective heart beat”

A victim in cardiac arrest is unconscious and shows no signs of life.

- **Signs of life include**
  - Normal breathing.
  - Movement.
  - A pulse

- The victim’s skin may be ***pale, ashen or bluish***, particularly around the face. The face may also be moist from perspiration.
- In some cases, a victim of cardiac arrest may ***not*** have shown any ***warning signals***. This condition is called ***sudden death***.

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Cardiac Arrest

The First aider has to start CPR once recognizes the victim in cardiac arrest.

Adult CPR and AED

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Adult CPR & AED

There are two components in adult CPR

1) **Assessment & Recognition**
2) **Performing CPR**

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Adult CPR & AED

1) Assessment & Recognition

a) Assess for danger

B) Assess the response

C) Shout/Call for Help*

*** Call 999/ bring the Emergency trolley/ bring an AED**

D) Assess for breathing for (5- 10 sec)

(breathing / abnormal breathing – gasping-)

Adult CPR & AED

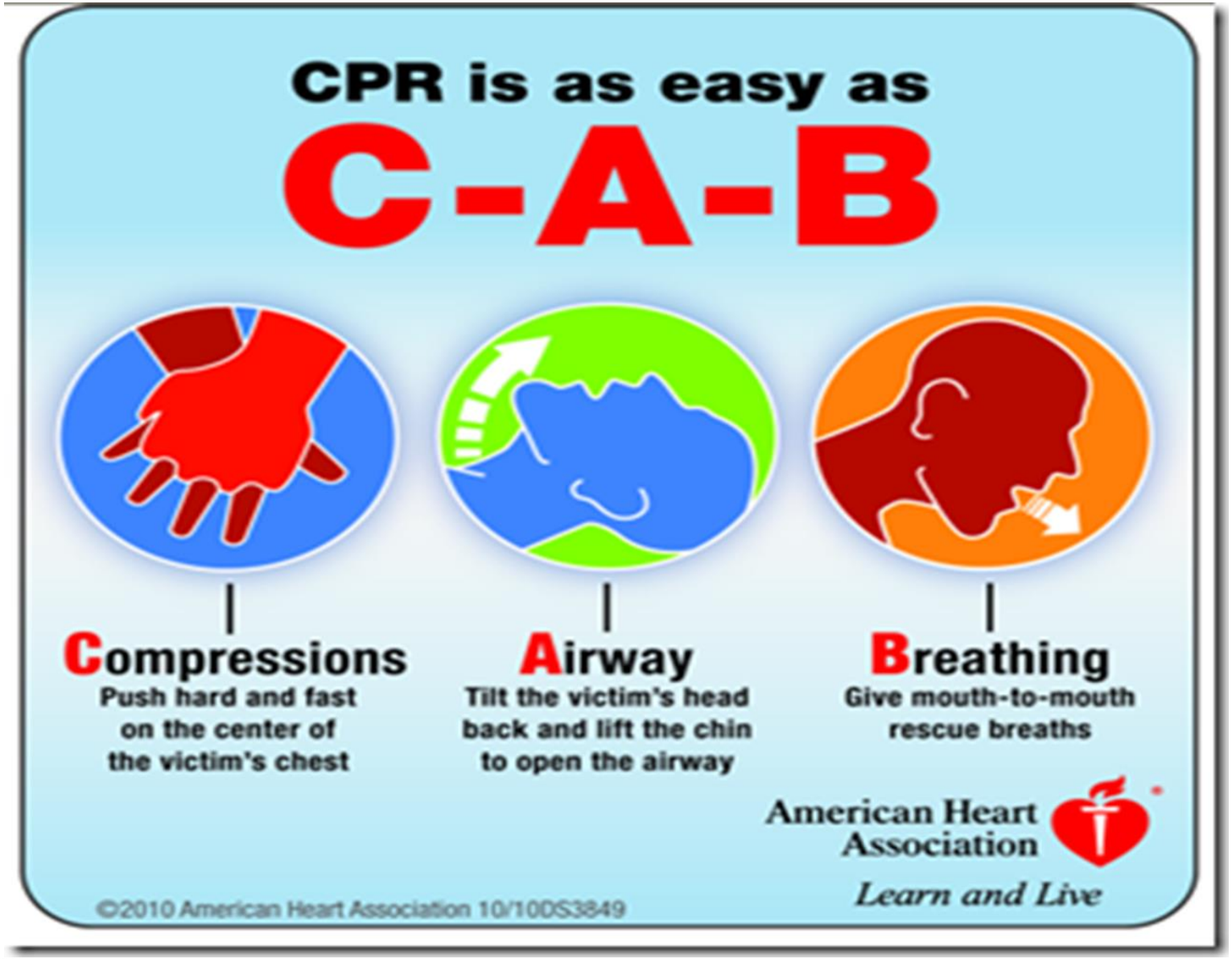
2) Performing CPR

Remember CAB

C: Cardiac Compression

A: Open the Airway

B: (2) effective Breathings



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Adult CPR & AED

C) Cardiac compression

Step	Action
1	Position yourself at the victim's side
2	Make sure the patient is lying on his back on a flat surface
3	Remove all the clothing covering victim's chest
4	Put the heel of one hand on the lower half of the breast bone .
5	Put the heel of your other hand on the top of the first hand

Adult CPR & AED

C) Cardiac compression

Step	Action
6	Straighten your arms and position your shoulders directly over your hands
7	Push hard and push fast –* insure high quality compression-
8	At the end of each compression make sure you allow the chest to recoil
9	Deliver compressions at rate of 100-120 compression per minute

Adult CPR & AED

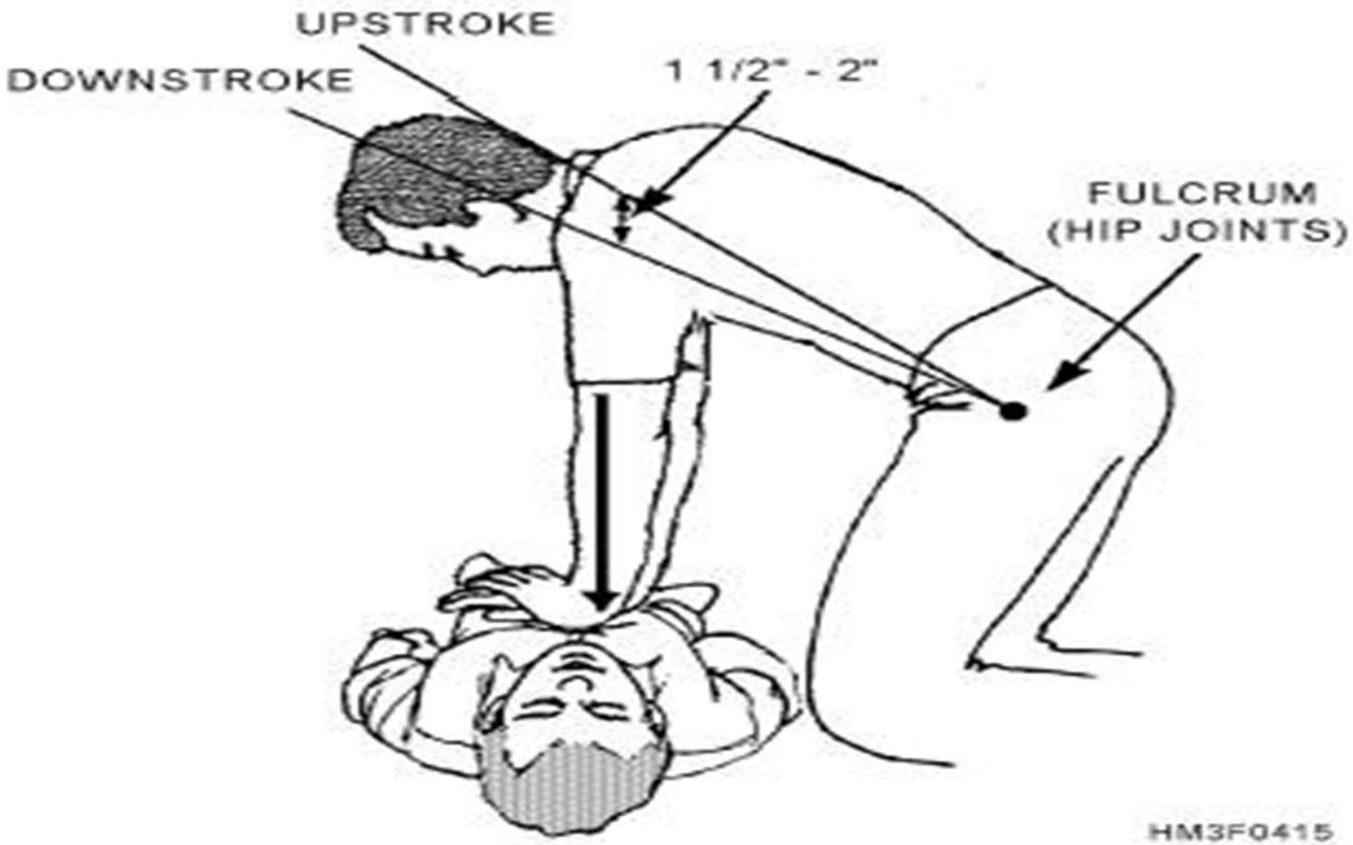
C) Cardiac compression

***High Quality Compressions**

- Adequate rate *100-120 compressions/min*
- Adequate Depth *at least (5cm)* or *(2 inches)and not more than (2.4 inches) or (6 cm)*
- Allow complete chest recoil after each compression
- Minimizing interruptions in compressions
- Avoiding excessive ventilation

Adult CPR &AED

C) Cardiac compression



Adult CPR & AED

A) Open The Airway

- **head tilt and chin lift or jaw thrust**

B) give (2) Breaths

- **allow adequate chest rise-**

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Adult CPR & AED

A) Opening the Airway

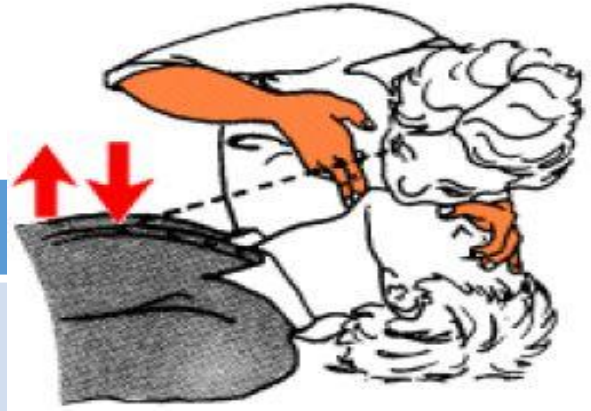
- **Performing Head tilt- Chin lift**

Step	Action
1	Place one hand on the victim's forehead and push with your palm to tilt the head back
2	Place the fingers of the other hand under the bony part of the lower jaw near the chin
3	Lift the jaw to bring the chin forward

Adult CPR & AED

B) Giving 2 Breathings

- **Performing mouth- to- mouth breathing**



Step	Action
1	Hold the victim's airway open with head tilt chin lift
2	Pinch the nose closed with the your thumb and Index finger (using the hand on the forehead)
3	Take regular -not deep- breath and seal your lips around victim’s mouth creating airtight seal

Adult CPR & AED

B) Giving 2 Breathings

Step	Action
4	Give 1 breath (blow for 1 second) watch for the chest to rise as you give the breath
5	If the chest does not rise repeat the head tilt chin lift
6	Give a second breath (blow for 1 second) watch for the chest rise

Adult CPR & AED

- Repeat the cycle (30:2)* for 5 times in 2 minutes

- Defibrillation (AED)

- **Should be used once it is available-**

* One rescuer and two rescuer are the same

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What is an AED ?

- **An Automated External Defibrillator (AED) is:**

- A small portable electrical device that automatically analyses potentially life threatening cardiac rhythms in a patient and treats it by defibrillation, the application of an electrical shock, to allow the heart to re-establish normal rhythms.

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What is an AED ?

- **An Automated External Defibrillator (AED)**

- It is designed to be used primarily by first responders in cardiac emergencies who may not be fully trained in Advanced Cardiac Life Support (ACLS).

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How to operate an AED ?

- **The Common Steps to Operate all AEDs**

Step No.	Action
1	**Power ON the AED.** • Open the carrying case or the top of the AED. • Turn the power on.
2	**Attach electrode pads to the victim's bare chest.** • Choose the adult pads •Peel the backing away from the electrode pads. • Quickly wipe the victim's chest if it is covered with water or sweat.

How to operate an AED ?

The Common Steps to Operate all AEDs

Step No	Action
2 (cont.)	• Attach the adhesive electrode pads to the victim's bare chest. - Place one electrode pad on the upper right side of the bare chest to the right of the breastbone, directly below the collarbone. -Place the other pad to the left of the nipple, a few inches below the left armpit. • Attach the AED connecting cables to the AED box.
3	"Clear" the victim & analyze the rhythm. • Always clear the victim during analysis. Be sure that no one is touching the victim, not even the person in charge of giving breaths. • Some AEDs will tell you to push a button to allow the AED to begin analyzing the heart rhythm. It may take about 5 to 15 seconds to analyze. • The AED then tells you if a shock is needed.

How to operate an AED ?

The Common Steps to Operate all AEDs

Step No	Action
4	**If the AED advises a shock, it will tell you to be sure to clear the victim.** **• Clear the victim before delivering the shock: be sure no one is touching the victim to avoid injury to rescuers.** **- Loudly state a "clear the patient" message such as "I'm clear, you're clear, everybody's clear" or simply "clear".** **- Perform a visual check to ensure that no one is in contact with the victim.** **•Press the "SHOCK" button.** **•The shock will produce a sudden contraction of the victim's muscles**

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How to operate an AED ?

The Common Steps to Operate all AEDs

Step No	Action
5	As soon as the AED gives the shock, begin CPR starting with chest compressions.
6	After 2 minutes of CPR, the AED will prompt you to repeat steps 3 and 4.

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Special Consideration when using an AED

1) The victim has a hairy chest

Step	Action
1.	If the pads stick to the hair instead of the skin, press down firmly on each pad
2.	If the AED continues prompt you to " check the pads" quickly pull of the pads . This will remove large amount of hair and should allow the pads to stick to the skin - Or Shave the area with the razor if available in the AED carrying case
3.	Put on a new set of pads. Follow the AED voice prompt

Special Consideration when using an AED

2) Water :

Water is a good conductor of electricity .Do Not use an AED in water .

- If the victim is in the water, pull the victim out of the water.
- If water covers victim’s chest , quickly wipe the chest before attaching the AED pads
- If the victim is lying on snow or in a small puddle, you may use the AED .

Special Consideration when using an AED

3) Implanted Defibrillators or Pacemakers

- Some victims may have implanted defibrillators or pacemakers.
- The rescuer can immediately identify these devices because they create a hard lump beneath the skin of the upper chest or abdomen with an overlying scar.
- If possible avoid placing the AED pad directly over the implanted device because it may blocks the delivery of the shock to the heart.

Special Consideration when using an AED

4) Transdermal Medication patch

- Do not place the AED Pads directly on top of a medication patch (e.g.

Nitroglycerin, nicotine, pain medications)

The medications patch may block the transfer of energy from the AED pad to the heart and may cause small burn to the skin

Child and Infant CPR and AED

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Child CPR

Step	Action
1.	Make sure the scene is safe
2.	Assess for response / consciousness . If no response
3.	Shout / call for help
4.	Check whether the child is breathing or no breathing or gasping
5.	Start an effective Cardiac Compression 30:2 (1-Rescuer) 15:2 (2 Rescuer) - The depth of Cardiac compression at least 1/3 diameter (5cm) - Use the heel of one hand only on the center of the victim's bare chest between the nipple's line -Allow chest recoil - Deliver at 100- 120 compression per minutes

Child CPR

Step	Action
6.	Give 2 breaths (blow each for 1 second) watch for the chest rise
7.	Complete the cycles in 2 minutes i.e. 30:2 (1-Rescuer) for 5 cycles 15:2 (2- Rescuer) for 10 cycles
8.	Attach the victim to Defibrillator if available & minimize interruption before and after shock

Child CPR

Infant CPR

Steps	Action
1.	Make sure the scene is safe
2.	Assess for Responsiveness (by tapping on the infant's foot & shout baby ..baby are you ok ?)
3.	Shout for help
4.	Look at the chest and see whether the baby is breathing , no breathing or gasping
5.	Start an effective cardiac compression

Infant CPR

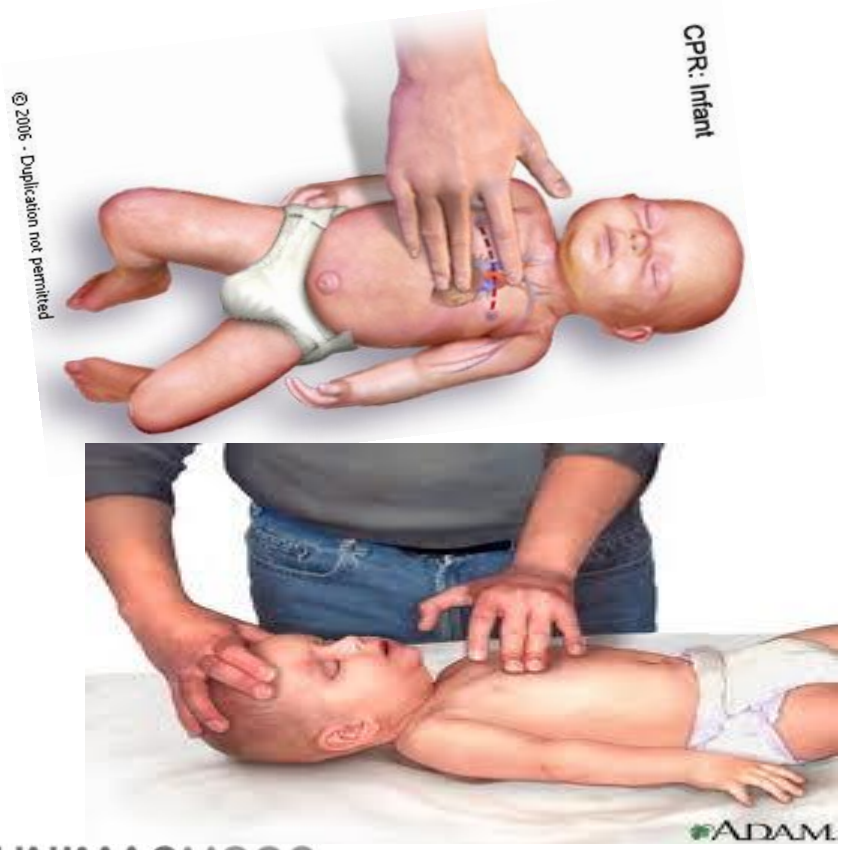
Steps	Action
5. (cont')	**Start an effective Cardiac Compression 30:2 (1-Rescuer)** **15:2 (2 Rescuer)** **-30: 2 (1- Rescuer) two fingers technique** **(place the middle and the index fingers just below the imaginary line between the nipples Do not press on the xiphoid, with the 2 fingers straight on the chest start the compressions)** **-15:2 (2- Rescuer) the 2 thumb – encircling hands technique** **(- Draw an imaginary line between the nipples . Place both thumbs side by side in the center of the infant's chest on the breast bone just below this line.** **- Encircle the infant's chest and support the infant's back with the fingers of both hand**

Infant CPR

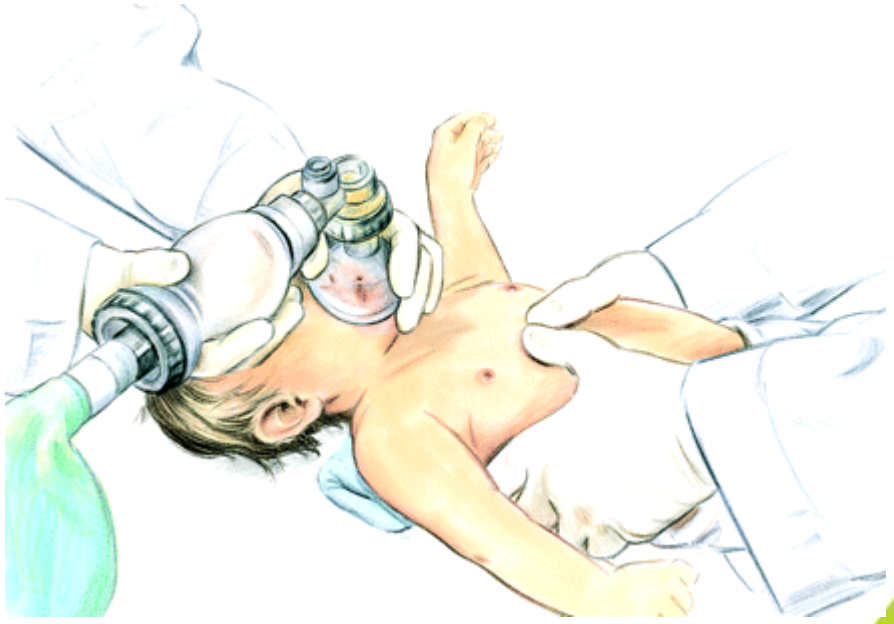
Steps	Action
5. (cont')	- With the hands encircling the chest use both thumbs to depress the breast bone approximately 1/3 the depth of the infant's chest -As you push down with the thumbs, squeeze the infant's chest with your fingers.) The depth of Cardiac compression about 1/3 diameter (4cm) - Allow chest recoil - Deliver at rate of 100 – 120 compression per minutes
6.	- Give 2 breaths (blow each for 1 second) watch for the chest rise
7.	Complete all the cycles in 2 minutes i.e. 30:2 (1-Rescuer) for 5 cycles 15:2 (2- Rescuer) for 10 cycles
8.	Attach the victim to Defibrillator if available & minimize interruption before and after shock

Infant CPR

ONE RESUER (two fingers technique)



TWO RESCUERS (The 2 thumb – encircling hands technique)



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AED for Infants and Children (1- 8 years of age)

There are a few special considerations when using an AED on an infant or child from 1-8 years of age.

- **Choosing the AED pads or AED child system**

- Some AEDs have " Pediatric dose attenuator". They have been modified to deliver different shock doses : one shock dose for adults and one for children.
- If the AED includes a smaller size pad designed for children, use it. If not, use the standard pads, making sure they do not touch or overlap.

AED for Infants and Children (1- 8 years of age)

➢ Use of an AED for Infants and Children

- As in adults, use the AED as soon as it is available.
- Use child pads and pediatric dose attenuator if available, for infants and for children less than 8 years of age

➢ Use of an AED for infants

- For infants a manual defibrillator is proffered to an AED for defibrillation
- If manual defibrillator is not available , an AED with paediatric dose attenuator is preferred
- If neither is available , you may use adult AED.

In Summary ..

- Cardiac emergencies are life threatening disorders that must recognize and treat immediately.
- First Aider has to start CPR and ask for an AED once he/she recognizes the victim in cardiac arrest.
- There are many differences and similarities in performing 1 rescuer or 2 rescuer CPR for an adult , child and infant.
- AED is highly recommended in all ages, with special considerations in children and in infants.