One-Man CPR + AED
INTRODUCTION

About 2,400 persons develop an acute heart attack. In addition, nearly 1000 people collapse in the out-of-hospital environment.

Of these, only about 2.7% survive.

Statistics from National Resuscitation Council as of Feb 2012
INTRODUCTION

- Based on national health statistics from MOH, heart disease & stroke together contribute to 31.4% of total mortality.
- In Singapore, heart disease at 23.6% is the 2nd cause of death after cancer.
INTRODUCTION

• When heart disease does occur & the person collapse from it (sudden cardiac arrest)……

• The *process of life-saving* can be *enhanced* if the rescuer could:
  • Recognise signs of collapse early.
  • Render basic life saving skills (e.g. CPR & the use of AEDs).
INTRODUCTION

Remember!

• Sudden death can be reversed.....
• If you react early & apply promptly basic life saving skills.
THE CHAIN OF SURVIVAL

Early Recognition and Access

Early CPR

Early Defibrillation (AED)

Early Advanced Care (ACLS)
**CHAIN OF SURVIVAL**

**The First Link: Early Recognition and Access**

- Early recognition of signs of cardiac arrest.
- Prompt activation of ambulance via 995.
- Giving way to ambulances on the road.
- Giving ambulance crew priority when they use elevators, stairs and corridors to reach destination.
The Second Link: Early CPR

- Brain cells can live without oxygen for 4 - 6 minutes before it begins to die.
- Any damage done to the brain after 10 minutes cannot be repaired.
- The only way to ensure oxygen and blood supply to the brain and vital organs is through performance of CPR.
The Second Link: Early CPR

- If CPR is performed **promptly** and **correctly**:
  - heart function may be restored, and
  - circulation may be maintained until institution of other life support measures.
The Third Link: Early Defibrillation

- Improves survival rates of out-of-hospital cardiac arrest casualties.
- Most common initial rhythm in cardiac arrest: ventricular fibrillation (VF).
The Third Link: Early Defibrillation

- Progress to death if not treated.
- Death rate increases by 10% for every minute without defibrillation.
- Works best in the first few minutes after onset of cardiac arrest.
WHAT IS AN AED?

An AED is a device that:

• Delivers electrical shocks to restart the pumping action of the heart.
• It is light weight & portable.
WHAT IS AN AED?

AED can perform the following:

- Analyze the electrical heart rhythm of the heart.
- Determine whether the casualty’s electrical rhythm needs to be shocked or whether shocked is not required.
WHAT IS AN AED?

AED can perform the following:

• If shock is required it automatically charges to a preset energy level.
• If no shock is required, the AED will not charge.
• Advise the rescuer, through a series of voice prompts, as to whether to deliver shock, check the casualty, or continue CPR.
• Provide signals to assist rescuers in the correct counting tempo & rate for chest compressions.
WHEN IS THE AED USED?

The AED is used when the person is:

- Unresponsive,
- Not breathing.

For children ages between 1 to 8 years or Weigh less than 25 kg, pediatric pads should be used! However, if there are no such pads, adult defibrillation pads should be considered.
CHAIN OF SURVIVAL

The Fourth Link: Early ACLS

• Frequently carried out in hospitals.
• Consist of advanced airway management, ventilation support, administration of medication and the control of arrhythmias.
Check for danger. Move casualty to a safe location, away from danger.
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Tap casualty’s shoulder and shout, “Hello! Hello! Are you okay?”
If there is no response, get someone to call 995 for the ambulance and another to get an Automated External Defibrillator (AED).
Perform a head-tilt-chin-lift maneuver to open the airway.
Before head tilt-chin lift
Block airway

After head tilt-chin lift
Open airway
Look, listen and feel for breathing up to 10 seconds.

Look for the chest rise and fall.
Listen for air escape during exhalation.
Feel for the flow of air from mouth and nose.
If no breathing, begin CPR. Run your middle finger from the lower margin of the rib cage until you reach the notch in the centre.
Place your index finger next to your middle finger. Put the heel of your other hand on the lower half of the breastbone next to the index finger.
Interlace the fingers of both hands and lift the fingers off the chest wall. Position yourself immediately above the casualty’s chest.
Give 30 chest compressions. Each compression should be at least 5 cm deep.

Count loudly as you compress.

1 & 2 & 3 & 4 & 5 &
1 & 2 & 3 & 4 & 10 &
1 & 2 & 3 & 4 & 15,
1 & 2 & 3 & 4 & 20,
1 & 2 & 3 & 4 & 25,
1 & 2 & 3 & 4 & 30.

Chest compression rate should be at least 100 per minute!
Give 2 ventilations after the 30 compressions. Duration of each breath is 1 second and ventilation volume should be between 400 ml to 600 ml.
Continue CPR (30 compressions followed by 2 ventilations) until ambulance crew arrives or casualty shows signs of life.
AED STEP BY STEP GUIDE
Check for responsiveness. Tap shoulder firmly and shout, “Hello! Hello! Are you OK?”
If there is no response, get someone to call 995 for the ambulance and another to get the AED!
Perform head-tilt chin-lift maneuver to open the airway.
Look, listen and feel for breathing up to 10 seconds.
If there is no breathing, begin CPR. 30 compressions followed by 2 ventilations!

Perform CPR until the AED arrives!
Ensure safety and no contraindications. Switch on the AED and prepare the casualty.
PREPARATION FOR USE OF THE AED

The AED should not be used in the presence of:

- Water.
- Metal.
- Flammable gas/ explosive environment.
PREPARATION FOR USE OF THE AED

Before applying the defibrillation pads onto the casualty:

• Expose the person’s chest adequately.
• Push aside any jewelry or accessories that is resting on the person’s chest.
• Remove any patches from the person’s chest if any.
• Shave excessive hair from the person’s chest.
PREPARATION FOR USE OF THE AED

Before applying the defibrillation pads onto the casualty:

• Expose the person’s chest adequately.
• Clean and dry perspiration off the chest.
• If there are any pacemakers, place defibrillation pads four finger breadths away.
APPLYING DEFIBRILLATION PADS

To apply the pads:

1) Check the expiry date on the packet.
2) Remove pads from packet and peel off the protective backing.

Apply pads while CPR is in progress. **DO NOT** interrupt the chest compressions and mouth to mouth ventilations!
To apply the pads:

3) Place one pad vertically on the right breastbone just below the collarbone.

4) Place the other pad horizontally, one palm below the left armpit, towards the middle of the chest region.
APPLYING DEFIBRILLATION PADS

To apply the pads:

5) Make sure the pads are properly pasted with no air pockets.
WHEN USING THE AED

Safety is the most important factor for the AED operator!

Do NOT allow anyone to come into contact with a casualty during...

• **Analysis**
  CPR and movement can interfere with accuracy of machine’s reading.

• **Defibrillation**
  Electric current to be passed to the person in contact with the casualty.
Follow the voice prompts!
Plug the cable into the AED and apply defibrillation pads onto chest while CPR is in progress.
The AED machine will analyze the heart’s electrical rhythm and give a voice prompt, “Analyzing heart rhythm. Do not touch patient”.

If you hear this, **STOP CPR** and say clearly “Stand Clear”.
If the casualty has a shockable rhythm (VF), the AED will charge automatically. Once the AED is fully charged, it will prompt, “Press the shock button now.”

When you hear this, say clearly “Stand Clear” and press the shock button on the AED.
After delivering shock, perform 1 minute of CPR.
The AED machine will analyze the heart’s electrical rhythm and give a voice prompt, “Analyzing heart rhythm. Do not touch patient”.

If you hear this, **STOP CPR** and say clearly “Stand Clear”.
If the AED picks up a non shockable rhythm, it will prompt, “No shock advised. Check the patient”. If the casualty is not breathing, continue CPR.
Continue CPR and use of AED until casualty shows signs of life:

- Check for breathing.
- If the person is not breathing or only gasping, continue CPR and AED.
  or
- If the person is breathing, monitor breathing constantly until the ambulance crew arrives.
CONCLUSION

- Early CPR and the use of AED are two essential procedures that can frequently restart the heart if carried out early & properly.
- Thus increasing the chances of survival.