

Personal Safety

Standard Precautions

- **Barrier Devices**

- Gloves (Latex Free)
- CPR Face Shield
- CPR Mouth Piece
- Pocket Mask
- Safety Goggles/Glasses
- Aprons & Gowns
- Safety Shoes



Health Hazards – Safety First

Diseases spread through blood and other bodily fluids like HIV / AIDS Hepatitis B & C

Never regard any patients as ‘Safe’, Not even children!

Bag Valve Mask

- BVM should always be used with oxygen if this is available.
- Comes in three sizes - Adult, Child and Infant.
- Ventilation with a BVM is more effective than mouth-to-mouth for unresponsive patient who is not Breathing.
- BVM is used by Two rescuers working as a team
- Make sure that a good Seal is achieved.

Bag Valve Mask

- Open the airway using Head-tilt Chin-lift method.
- Place mask over the patient's mouth and nose with pointed end towards their Forehead.
- Place point of Mask over the bridge of patient's Nose as a guide for correct position.

Bag Valve Mask

- Do not squeeze bag too quickly or too forcefully, as this will cause air to go into the patient's stomach.
- Squeeze the bag just until you see the patient's chest rise.
- If too much air enters the stomach it can cause vomiting and aspiration

Oxygen Therapy

- Oxygen is an odourless, colourless, present in the atmosphere at 21% and is essential for life.
- Expired air contains about 16% oxygen
- Oxygen helps fire to spread quickly. Must keep it away from naked flames or other sources of ignition.
- Used in patient in medical emergency with breathing difficulty

Oxygen Therapy

- Oxygen supply to vital organs, like heart, lungs and brain may be reduced.
- Give a measured dose to achieve oxygen levels of 94-98% for Adult and 96-98% for Pediatric patients
- During cardiac arrest, give patient as high a concentration of oxygen as possible.

Oxygen Delivery Equipment



Portable cylinders

CD – Capacity 500 litres

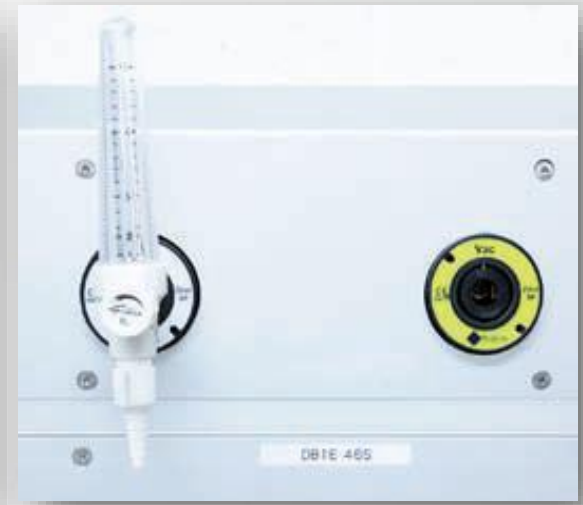
D – Capacity 340 litres.



Transportable cylinders

F – Cylinders – 1350 litres

G – Cylinders – 3000 litres



Fixed wall systems

Unlimited capacity.



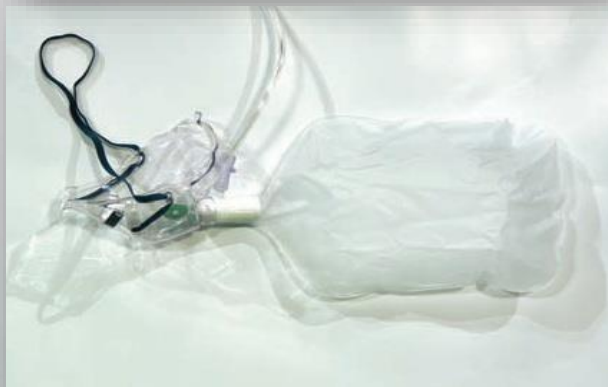
Nasal Cannula

Delivers up to 44% oxygen



Standard Oxygen Mask

Delivers up to 60% oxygen



Non-rebreather Mask

Delivers >85% oxygen
15 liters a minute



Suction

- Suction is created by a vacuum generated by a mechanical device.
- Suction is used to clear the oropharynx and nasopharynx of blood, saliva and vomit through a special tube
- Rigid or Yankauer catheter is used for rapid removal of large amounts of blood, saliva and vomit
- Soft-tip catheters is best used for more controlled and difficult suctioning.

Suction Technique

- Measure from corner of the patient's mouth and angle of the jaw
- Suction also removes air and oxygen as well as removing blood, saliva and vomitus
- Suction attempts should be limited to periods, No longer than:
 - 15 seconds in Adults
 - 10 seconds in Children
 - 5 seconds in Infants

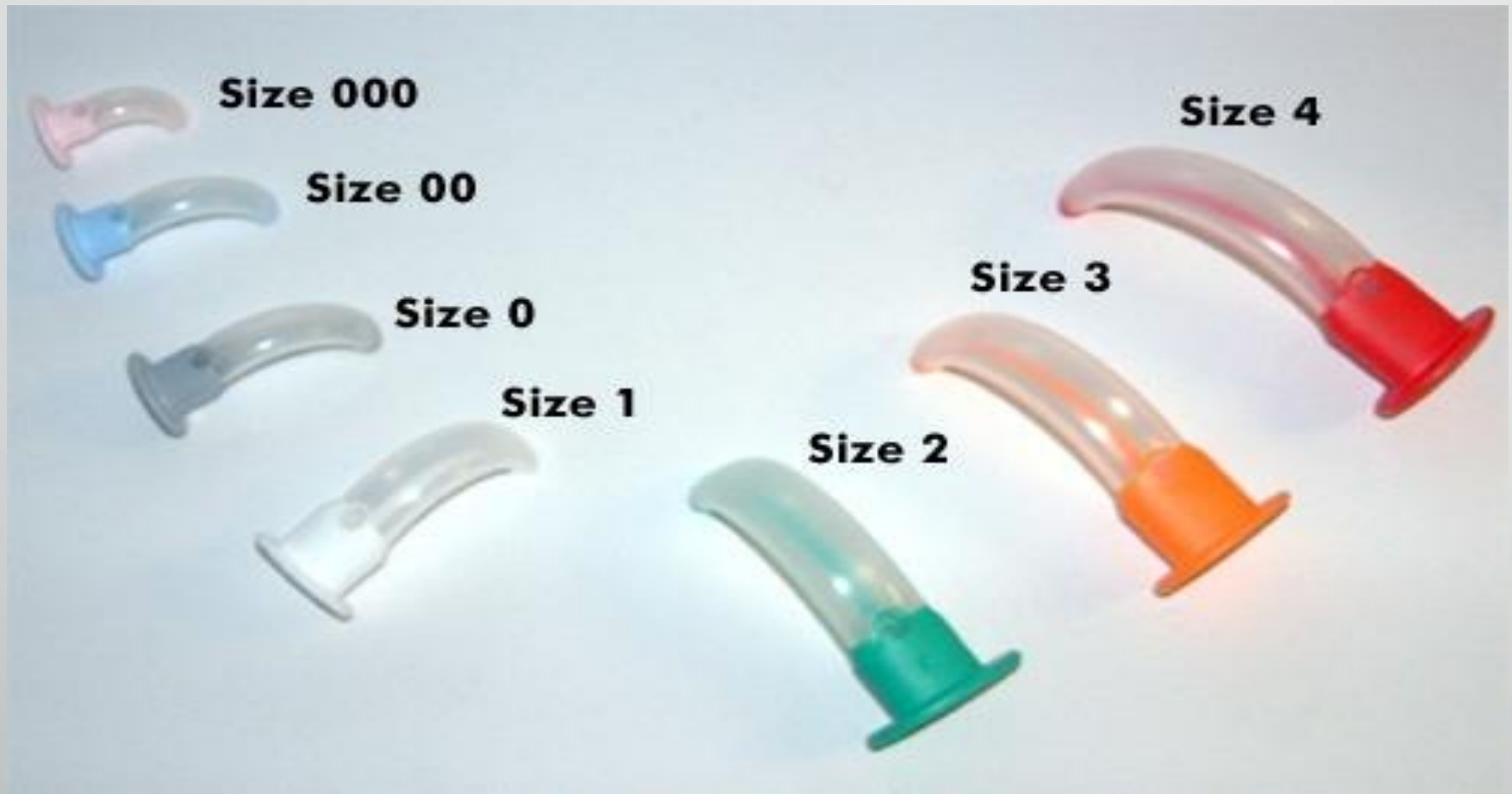


Indications

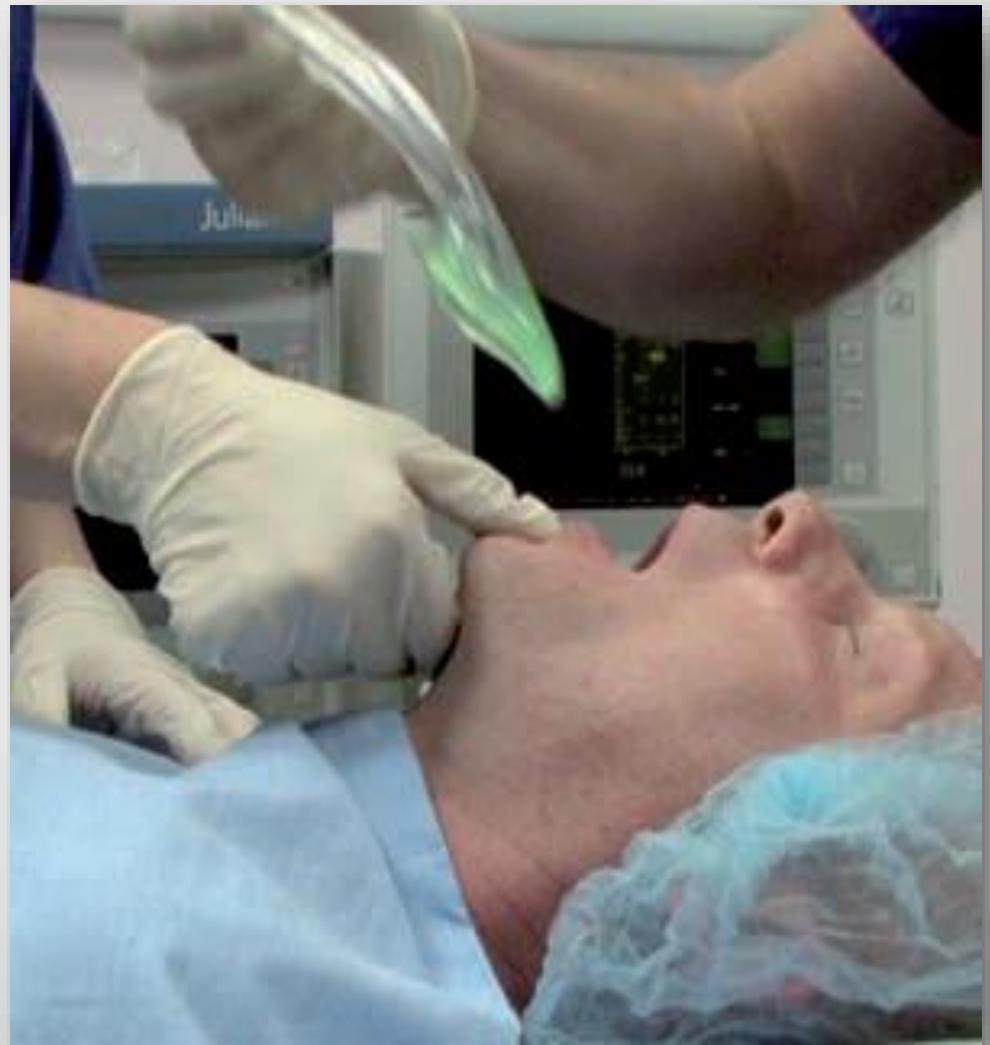
- Unresponsive
- **Contraindicated if...**
 - Patient's jaw is clenched (Trismus)
 - Patient is likely to vomit
 - Patient has a gag reflex



Oro-pharyngeal Airways



Advanced Airway: iGel

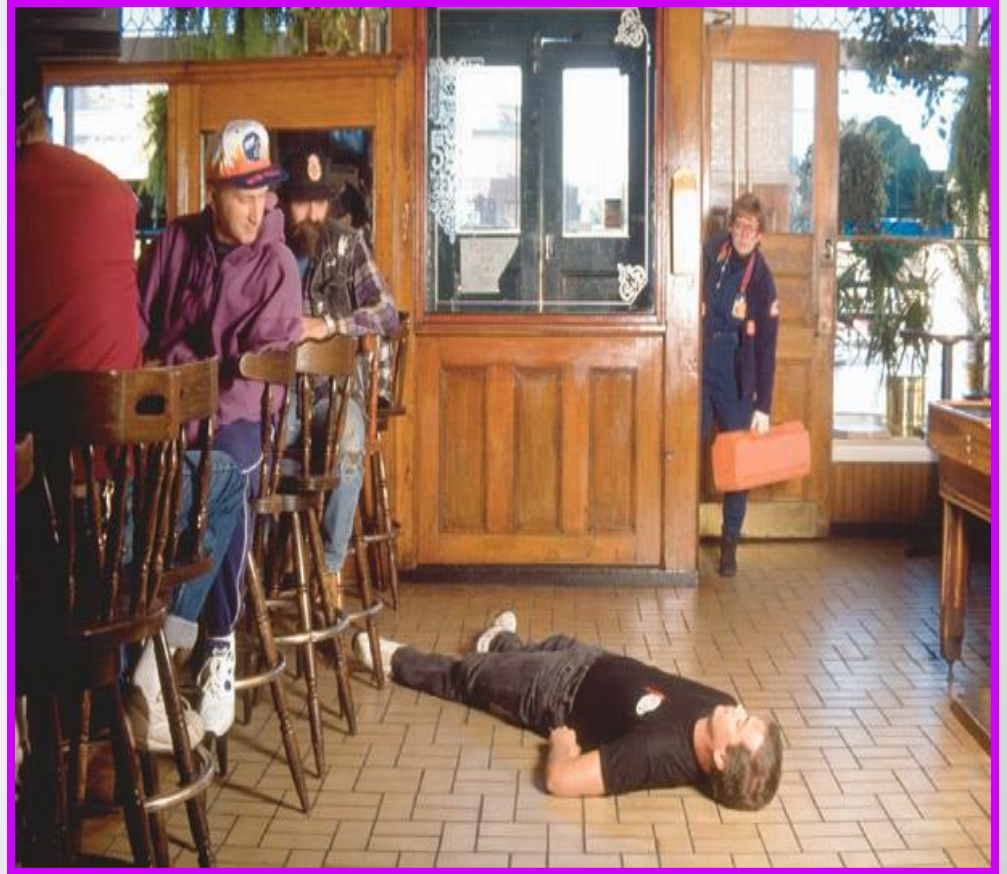


Scene Safety

- Self
- Scene
- Survivor

Scene Assessment

- Fire, Wires
- Chemical
- Traffic
- Farm
- Home
- School, At Work, Sports



CPR Guidelines for Adults & Children

Circulation

Airway

Breathing

For Infants

- **A**irway
- **B**reathing
- **C**irculation



Vital Signs Applicable to First Aid

- **Pulse:**

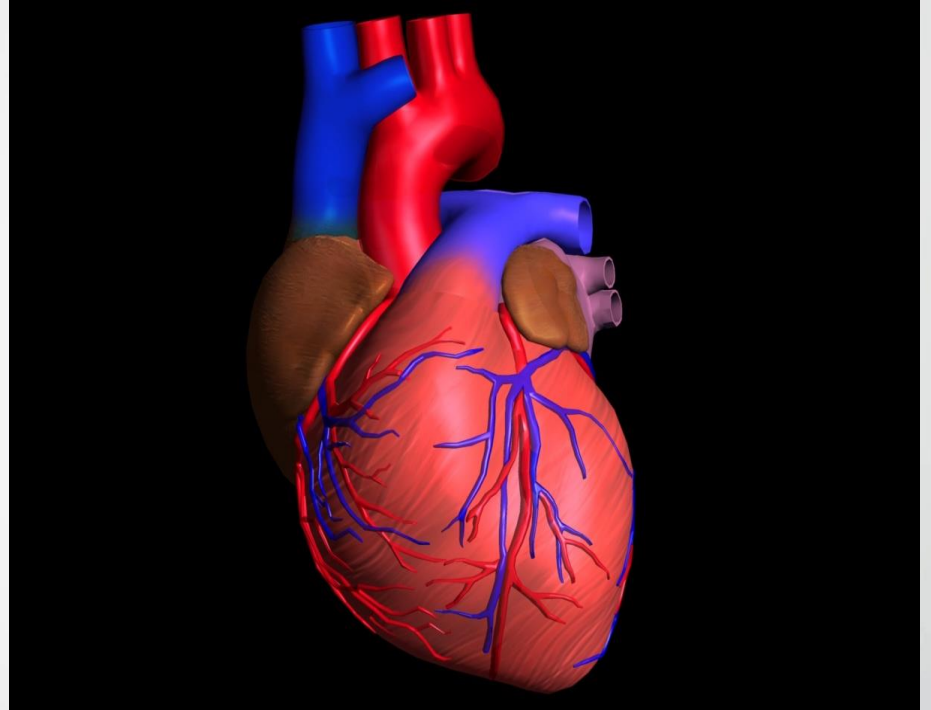
- Adult 60 - 100 beats per minute
- Child 80 - 110 beats per minute
- Infant 110 - 140 beats per minute
- Newborn 120 - 150 beats per minute

Respiration:

- Adult 12 - 20 breaths per minute
 - Child 15 - 25 breaths per minute
 - Infant 20 - 30 breaths per minute
 - Newborn 40 - 50 breaths per minute
- Observe Speed, Depth & Breathing Sound
- ‘**Agonal Gasps**’ are not Effective Breaths

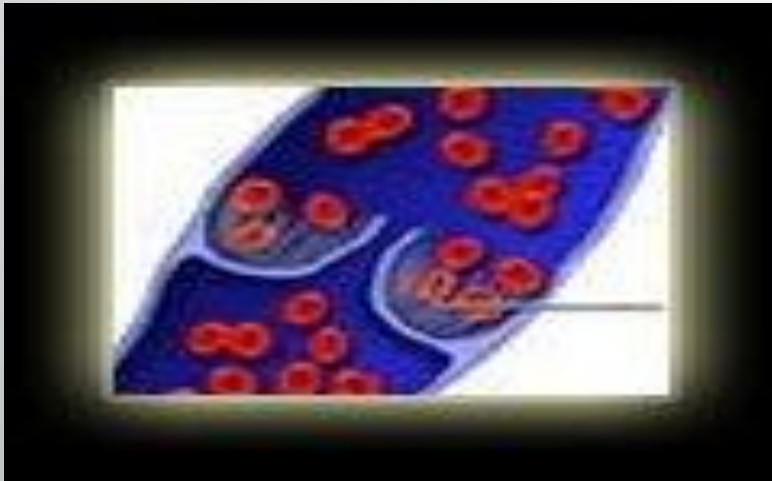
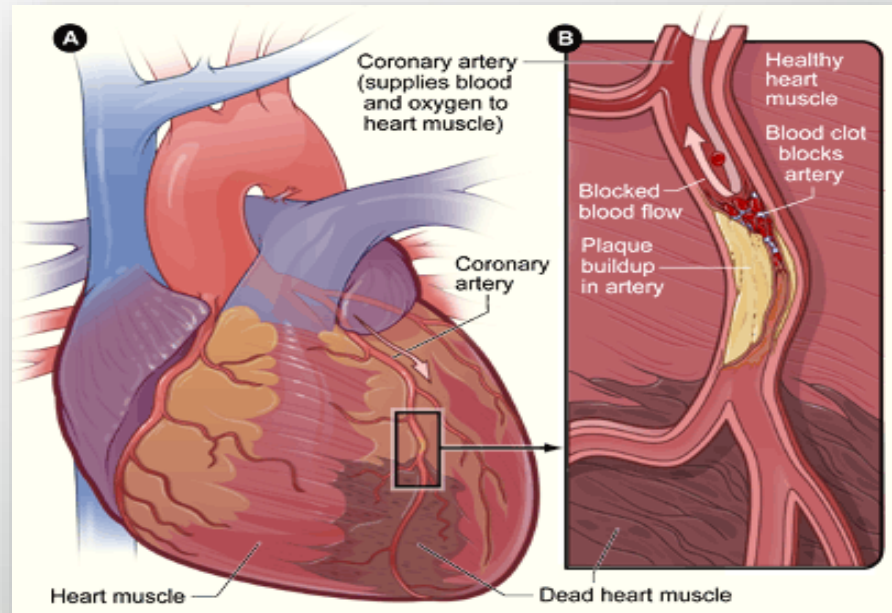
The Heart

- Fist size
- Muscular Organ
- Centre of Chest
- Four Chambers
- Pumping Action



The Heart

- Two main Coronary arteries
- Supply Blood to the Heart muscle
- Heart Disease due to narrowing or blockage



Heart Attack

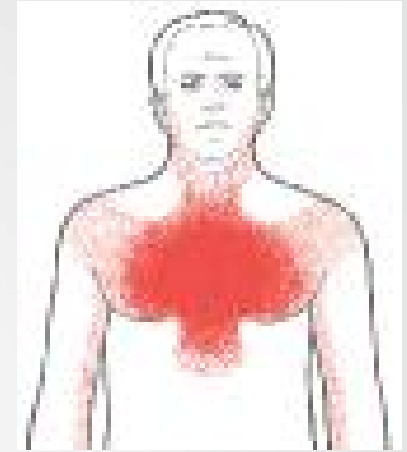
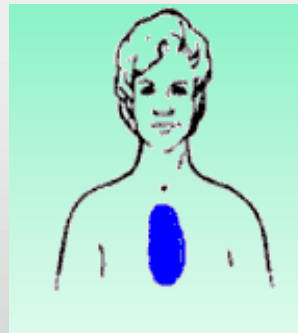
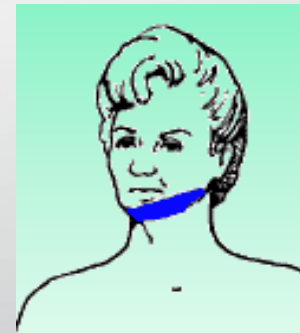
- Commonly caused by a sudden obstruction of blood supply to part of the heart muscle
- Clot in a Coronary artery



Heart Attack

Signs, Symptoms

- Severe chest pain
- Spreading to jaw or one / both arms
- Pain not eased with rest
- Discomfort high in the abdomen may feel like severe indigestion
- Collapse without warning



Heart Attack

- Shortness of Breath
- Feeling of Impending Doom
- Ashen skin
- Blue lips (Cyanosis)
- Profuse Sweating
- Air Hunger
- **Silent Infarction may be seen in Diabetics, Women and Elderly men**



Heart Attack

Treatment

- Place in Half Sitting Position
- Make casualty Comfortable
- Call an Ambulance/Doctor/ACLS
- **Medication**
 - Take themselves
 - Assist Patient to take medicine
 - Administer to patient
- Rest & constantly Monitor
- MONA (Morphine, Oxygen, Nitrates, Aspirin)



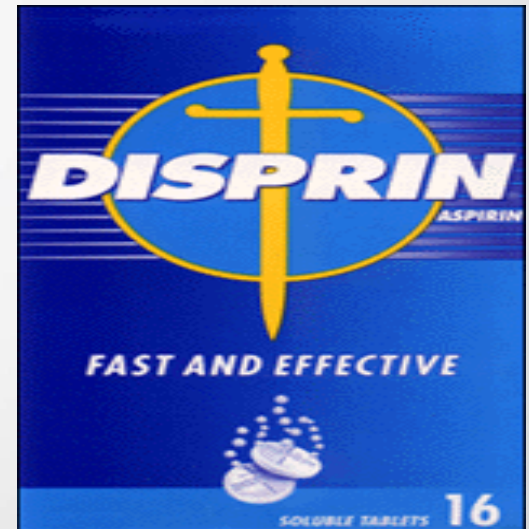
Aspirin

Presentation

- 300 mg Soluble Tablet irrespective of previous dose
- Check date of expiry

Administration

- Chewed Slowly
- Dispersed in 100 ml of water
- Coated Tabs not recommended
- Note time when Aspirin is given



Aspirin

Side Effects

- Epigastric pain and discomfort
- Bronchospasm (Asthma)
- Gastrointestinal Hemorrhage

Contra-Indications

- Allergy
- Bleeding disorder
- Active Gastro-intestinal Ulcer
- Age < 16 years

Stroke

Occurs when blood flow to the brain is disrupted by a Clot or Bleeding from a damaged blood vessel.

Warning Signs of Stroke

- Sudden numbness & Weakness of face, limbs, on one side of the body
- Headache or Dizziness
- Sudden Confusion, trouble speaking / understanding
- Sudden trouble seeing in one or both eyes
- Gradual/Sudden loss of consciousness
- Paralysis down one side of body
- Drooping of one side of the face

F.A.S.T. Assessment

- **F** – Facial Weakness
 - Can patient smile or show teeth
 - Have Eyes or face drooped?
- **A** – Arms Weakness
 - Can patient raise both arms equally and hold position for 5 seconds
- **S** – Speech Problems
 - Can patient speak clearly and understand what you say
- **T** – Even if One is Positive, its Time to
 - Note onset of Symptoms, Call for help, Treat

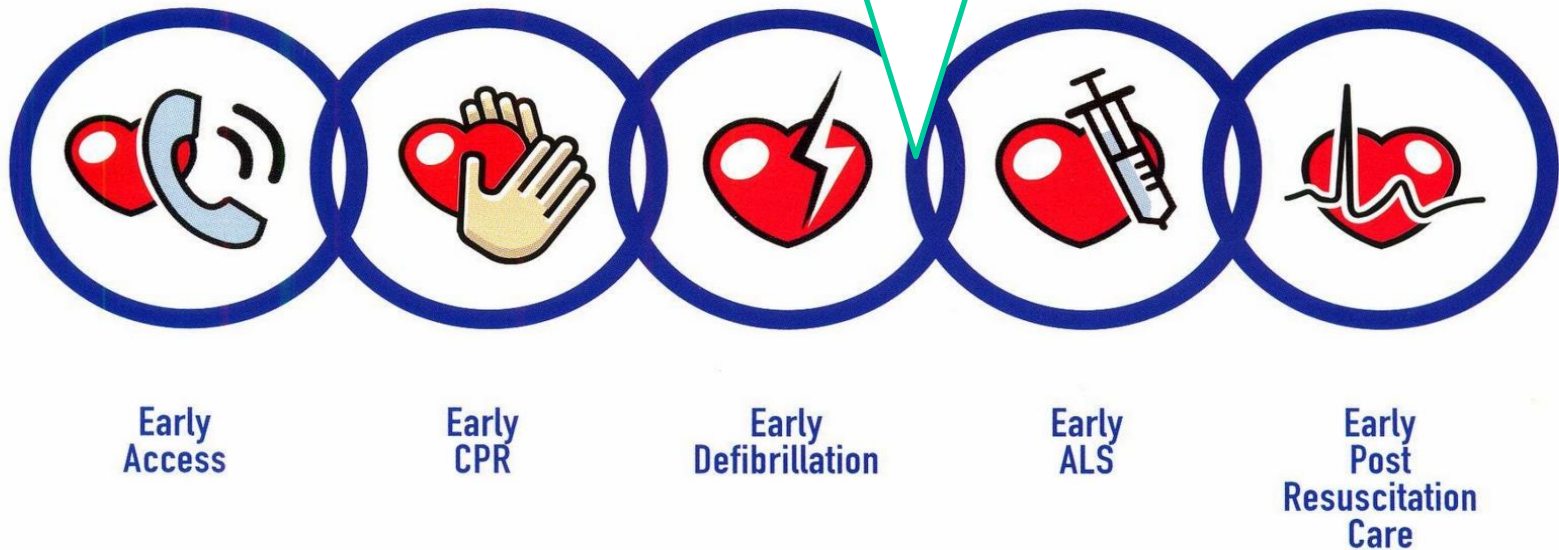
Stroke

Treatment

- Keep casualty comfortable
- Call for an ambulance
- Lie casualty down
- Raise head and shoulders slightly
- Tilt casualty's head towards weaker side to allow fluid to drain out
- Wipe face with damp cloth if they dribble

Adult Chain of Survival

Role of
CFR/BLS



Pediatric Chain of Survival

Role of
CFR/BLS



**Early
Prevention**

**Early
CPR**

**Early
Access**

**Early
ALS**

**Post
Resuscitation
Care**



Chain of Survival

Adult

1. Early Access
2. Early CPR
3. Early Defibrillation
4. Early Advanced Life Support
5. Early Post Resuscitation care

Mostly Cardiac Arrest

Exceptions:

Drowning, Suffocation, Poisoning & Choking

Paediatric

1. Early Prevention
2. Early CPR
3. Early Access
4. Early Advanced Life Support
5. Early Post Resuscitation care

Mostly Respiratory Arrest

Emergency Services 1122

Always Give the Following Information:

- Name & telephone number
- Give exact location with accurate directions
- Type of incident
- Seriousness of incident
- Number of patients
- Age, sex and condition of patients
- Number of dead people
- Any hazards
- Don't hang-up until you are told to do so
- Don't keep your phone engaged

Cardiac Arrest

Causes

- Heart Attack
- Drowning
- Poisoning
- Suffocation
- Electrocution
- Major Injuries
- Severe Allergic Reactions



Reversible Causes of Cardiac Arrest

Hs

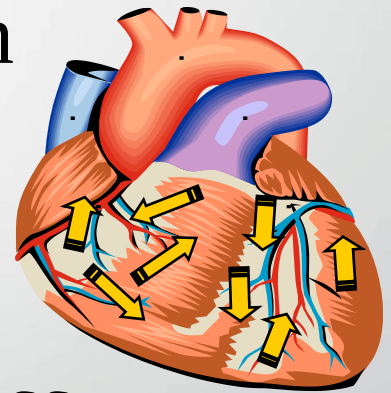
- Hypovolemia
- Hypoxia
- Hydrogen Ion (Acidosis)
- Hypo-Hyperkalemia
- Hypothermia
- Hypo-Hyperglycemia

Ts

- Thrombosis (M.I)
- Tamponade, Cardiac
- Tension Pneumo-thorax
- Thrombo-embolism (lung)
- Toxins / Tablets
- Trauma

Cardiac Arrest

- **Heart Attack is the most common cause**
- **Abnormal Rhythm**
 - Ventricular Fibrillation (70-80%)
 - Chaotic electrical activity
 - Uncoordinated muscular contraction
 - No effective pumping action
 - Death within minutes if not treated
 - Other causes are Asystole & Pulseless Electrical Activity (PEA)



CPR TIME LINE

- 0-4 mins. brain damage Unlikely
- 4-6 mins. brain damage Possible
- 6-10 mins. brain damage Probable
- Over 10 mins. probable Brain Death



Cardiac Arrest

Casualty

- Unresponsive
- Not Breathing
- No pulse

Management

- CPR



Cardiac Arrest (Adult)

- Scene Safety (Self, Survivor and Scene)
- Standard Precautions
- Check for Response
- If No Response, Get help and an AED
- Open Airway and Scan Chest for signs of Breathing
- In **No** Breathing or **NOT** Breathing normally, Call for Help, ask for an Ambulance and an AED

Cardiac Arrest (Adult)

- Check for Carotid Pulse for **at least 5 seconds** and **NOT** more than **10 seconds**
- Start Chest Compressions - Hand position in Center of the Chest between the nipples
- Deliver 30 Compressions @ 120 per minute in 15 seconds
- Ensure accuracy of Chest Compressions - Depth at least 2 inches (5 cm), allow full Chest Recoil

Cardiac Arrest (Adult)

- Insert right size OPA and give 2 Breaths (One sec each) either direct Mouth-to-Mouth, with Face Shield / Pocket Mask or BVM
- Continue cycles of 30 Compressions and 2 breaths until an AED arrives
- May check for pulse after two minute of CPR
- Continuing @ 30:2 and follow AED prompts

Key Concepts- High Quality CPR

- Start Chest compressions within **10 seconds** after confirmation of Cardiac Arrest
- Pushing Hard & Fast
 - Rate at least 120 per minute
 - Compression depth at least **2 inches** (5cm)
- Allow Full **Chest Recoil** after each compression
- Minimize Interruptions in Chest Compressions to < 10 Seconds
- Avoid Hyperventilation

Resuscitation of a Full Term Pregnant Woman

- Uterine Displacement – to decrease compression of Abdominal Aorta, Inferior Vena Cava and ileac arteries (L.L)

Deeper Chest Compression – mid sternum

- 4 minute limit to initiate delivery is advocated
- Initial C-Section within 4 minutes
- Deliver infant within 5 minutes of arrest

AED

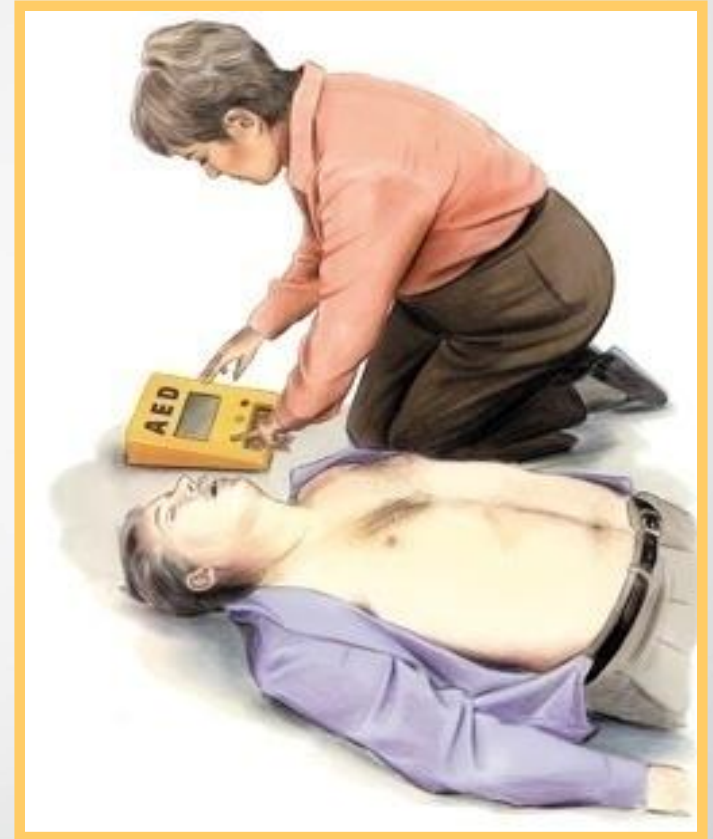
- **A**utomated
- **E**xternal
- **D**efibrillator



AED

Components

- Case
- On /Off switch
- Voice prompts
- Screen
- Pads
- Leads
- Analyze button optional
- Shock button



Important

Only Apply the AED on a Casualty Who is:

- Unresponsive
- Not Breathing
- No Signs of Circulation or Pulse



AEDs & Ventricular Fibrillation

- VF -most frequent initial rhythm in SCA
- Useless quivering of the heart that results in no blood flow
- Defibrillation is passage of electric current through the Heart
- Its the only effective treatment for VF
- Chances of survival increase with early CPR & Early Defibrillation
- Chances of survival decrease by 7-10% with every passing minute

AED Protocol



- Turn on the AED – follow steps 1-2-3
- Clear the patient's Chest
- Put left and right pads on patient's bare chest at correct position
- If shock advised, **Shout** to warn the people to stay '**Clear**'
- Deliver Shock by pressing the Orange button
- Immediately restart CFR with 30 chest compressions

AED

- To be used cautiously in Wet Weather
- Adult Pads may be applied to child but NOT vice versa
- Poor maintenance can cause AED failure
- Infant AED It is extremely unlikely to ever have to defibrillate a child less than 1 year old. same as for a child over the age of 1. place the defibrillation pads anterior (front) and posterior (back), because of the infant's small size.

AED Special Situations, Check for “**P**’s”

- **P**acemaker
- **P**erspiration
- **P**endants
- **P**atches
- **P**iercing
- **P**laytex
- **P**regnancy
- **P**ani (H₂O)

Cardiac Arrest (Child)

- Safety (Self, Survivor and Scene)
- Standard Precautions
- Check for Response
- If No Response, Get help and get an AED
- Open Airway and Scan Chest for Breathing
- In **No** Breathing or **NOT** Breathing normally, Call for Help, ask for Ambulance and an AED
- Check for Carotid Pulse for **at least 5 seconds** and **NOT** more than **10 seconds**
- If no pulse or if it is **<60**, Start Chest Compressions, **just below** the Nipple Line

Cardiac Arrest (Child)

- Deliver 30 Compressions @ 120 per minute in 15 seconds
- Insert the right size OPA
- Give Two effective breaths in Maximum **Five** Attempts
- After 5 cycles of CPR, change ratio to **15:2** if 2nd rescuer is available
- Continue until help or AED arrives or the victim becomes responsive

Cardiac Arrest (Infant)

- Safety (Self, Survivor and Scene)
- Standard precautions
- Check responsiveness
- **Shout** for help
- Open Airway, **Sniffing** position
- Insert OPA
- Check for Breathing
 - Look, Listen & Feel



Cardiac Arrest (Infant)

- Two Effective Breaths in Maximum 5 attempts
- Check **Brachial** Pulse, if its Absent or **< 60**, start 30 Chest Compressions **just below** the nipple line
- This is followed by Two effective Breaths
- Change to 15-2 if 2nd Rescuer is arrives
- After 5 cycles (2 Min. CPR), Call for help if not already done, continue until help arrives or infant becomes responsive

Infant CPR

- Make good seal over infant's nose & mouth with your own mouth
- Give 2 Effective breaths in max. 5 attempts
- If your mouth is too small to go over mouth and nose of the baby, you can blow through nose while keeping the mouth closed

Remember: If **Pulse rate is < 60** with poor perfusion, Continue CPR

Child / Infant

- One or two Hands technique in Child
- For Infant, use Thumb's technique in Two person CPR.
- For Child & Infant, Two persons CPR, the Rate changes to 15 to 2 after Two minutes CPR
- For a Child in Cardiac Arrest, you can shock after initial Two Minutes OR 5 cycles of CPR

Similarities & Differences in Adult, Child & Infant CPR

CPR Protocols	Adult 8 year or older	Child > 1 yr And < 8 yrs	Infant Up to 1 Year
Check for Responsiveness	By Tapping of Shoulders	By Tapping of Shoulders	By Tapping of Feet & Clap
Early Access	Call for help	Call for Help	Shout for Help
Opening the Airway	Head Tilt, Chin Lift	Head Tilt, Chin Lift	Sniffing Position
Inserting the OPA	Invert & Rotate	Direct / Straight	Direct / Straight
Giving Two Effective Breaths	Mouth to Mouth Nose Pinch in two attempts	Mouth to Mouth Nose Pinch, in Max. Five attempts	Seal Mouth over Nose & Mouth, in Max. Five attempts
Volume of Air	Give normal breath Look for chest rise	Give normal breath Look for chest rise	Puff of Air Look for chest rise
Ventilation Duration	1 second	1 second	1 second
Pulse Check	Carotid	Carotid	Brachial

Similarities & Differences in Adult, Child & Infant CPR

CPR Protocols	Adult 8 year or older	Child - > 1 year Less than 8 years	Infant Up to 1 Year
Compression	Both Hands	One or Both Hands	Two Fingers Two Thumbs with Two Rescuers
Compressions Depth	At least 2 Inches / 5-6cm	About 2 Inches 5 cm	1/3 AP Diameter of chest or 4 cm
Compression: Ventilations Single Rescuer	30:2	30:2	30:2
Compression: Ventilations Two Rescuers	30:2	15:2	15:2
Compression Rate (Speed)	120 per minute	120 per minute	120 per minute
AED protocol	Shock when advised	Shock when advised Use Child protocol	Used in Hospital settings

Advances Airway and Respiratory Arrest Situations

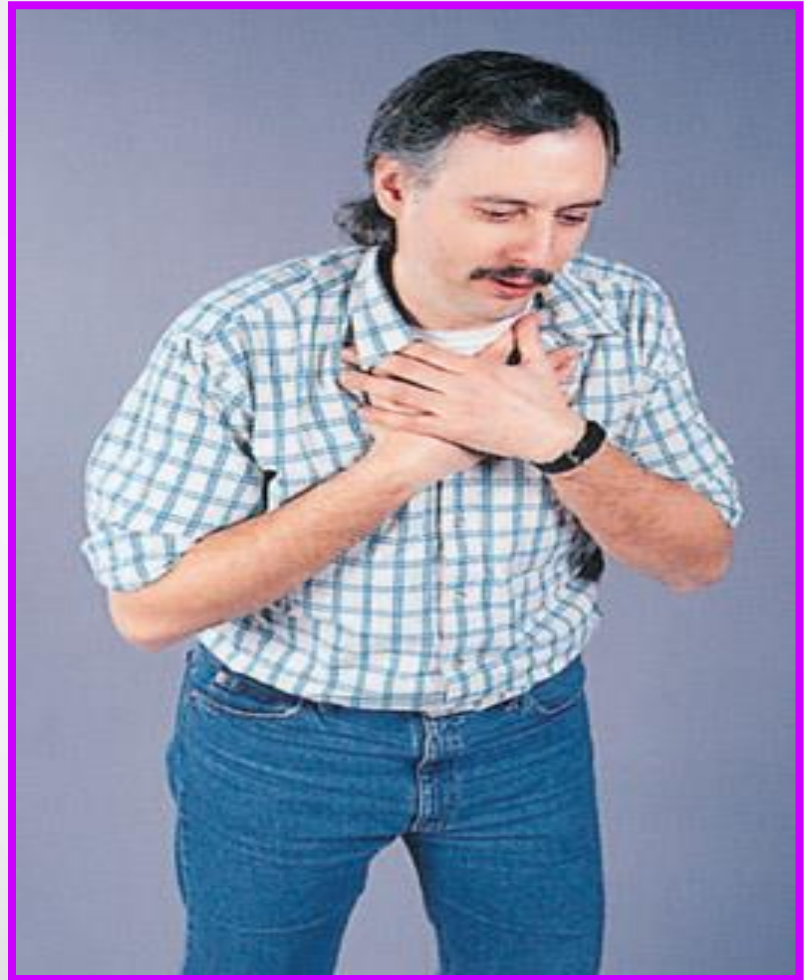
- One breath every 6-8 seconds (8-10 breaths/min)
Asynchronies with chest compressions

Respiratory Arrest Situations

- One breath after 5-6 seconds (10-12 breaths/ min in Adults)
- One breath after every 3-5 seconds (12-20 breaths/min in Children or infants)
- Chest Compression to Ventilation Ratio in New Born is 3:1

FBAO

- Foreign
- Body
- Airway
- Obstruction



Foreign Body Airway Obstruction

Mild or Partial Obstruction

Patient Responsive

- Ask are you Choking?

Patient can

- Speak
- Make sounds
- Cough loudly
- Encourage casualty to Cough
- Advise to go to hospital if needed

FBAO (Adult)

Severe or Full Obstruction Patient Responsive

- Ask are you Choking?
- Reassure
- Give up to **Five Back Blows**
- Perform **Five Abdominal Thrusts** until object comes out or Casualty goes Unresponsive



FBAO (Adult)

Patient Unresponsive

1. Call for Help
2. Start CPR with 30 Chest Compressions
3. Open mouth wide and Remove Object if you can see it
4. Continue CPR
5. Each time open the mouth to see obstructing Object, Try to remove it and provide two ventilations

FBAO (Adult)

Pregnant or Obese

- Perform Chest Thrusts

Bed Ridden Patient

- Straddle the patient
- Perform Abdominal Thrusts

Wheelchair bound Patient

- If possible, remove sides from chair
- Kneel behind the patient
- Perform Abdominal / Chest Thrusts



FBAO (Child)

Mild or Partial Obstruction

Responsive

- Ask are you choking?

The Child Can

- Speak
- Make Sounds
- Cough loudly
- Encourage casualty to Cough
- Advise to go to hospital if needed

FBAO (Child)

Severe or Full Obstruction

Patient Responsive

- Ask are you Choking?
- Perform five Back Slaps
- Followed by five Abdominal Thrusts
- Continue until object comes out or casualty goes Unresponsive

FBAO (Child)

Unresponsive Child

1. Call for Help
2. Place on flat surface
3. Open Airway, look for the obstructing object and try to remove if possible
4. Try to ventilate (up to 5 Times)
5. Continue CPR

FBAO (Infant)

Mild or Partial Obstruction

The Infant Can

- Make Sounds
- Cough loudly
- Let Infant Cough
- Advise to go to Hospital if needed



FBAO (Infant)

Severe or Full Obstruction

Infant Responsive

1. Cannot Breathe
2. Cannot make a Sound or Cry
3. Has high pitched noisy Breathing
4. Begin Five **Back Slaps** and Five **Chest compressions** until Object comes out or infant goes Unresponsive



FBAO (Infant)

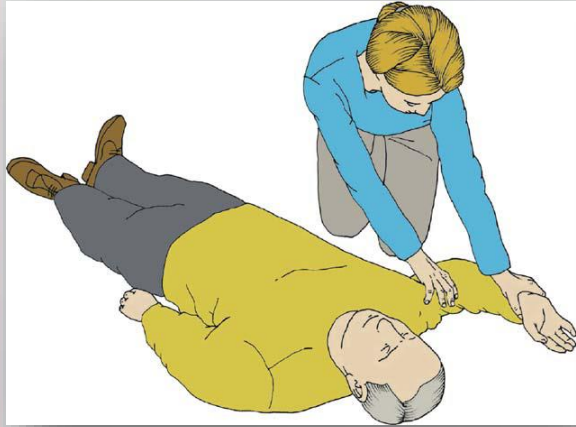
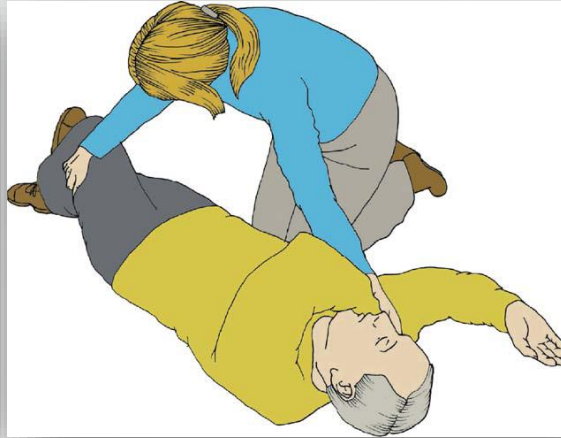
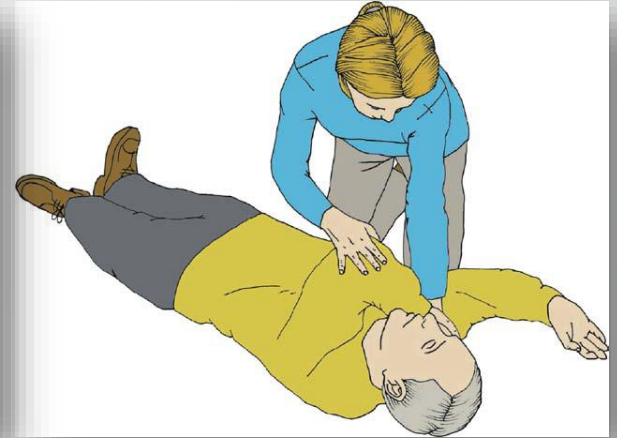
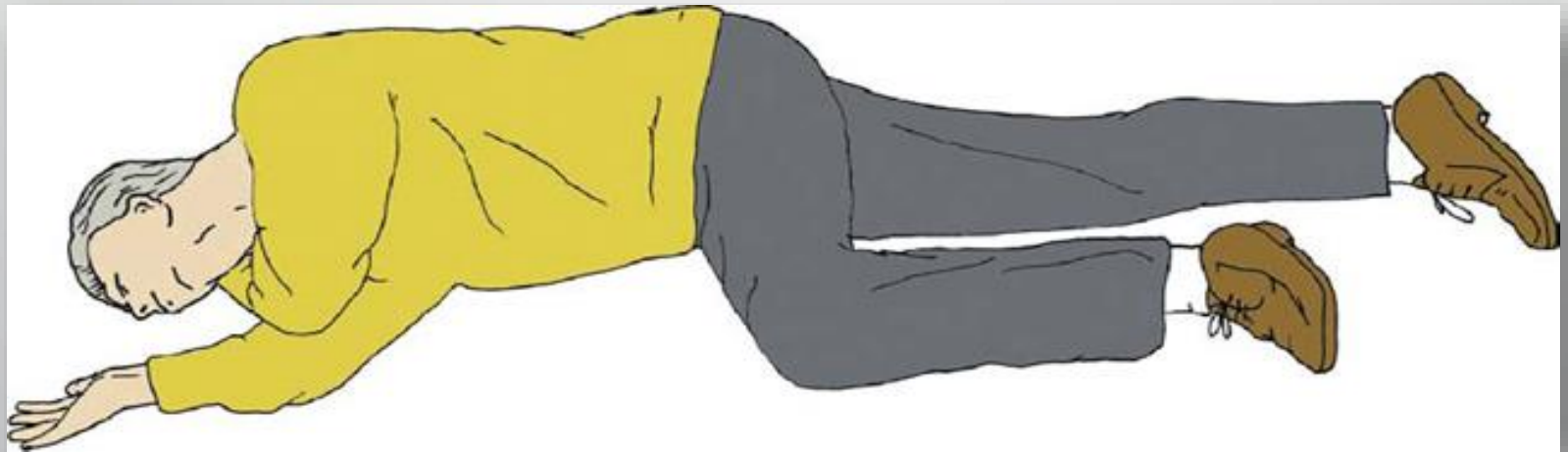
Infant Unresponsive

1. Call for Help
2. Place on flat surface
3. Open Airway, Look into the mouth for obstructing object and try to remove it if you find one
4. Try to ventilate (max five attempts)
5. Start chest compression

Continue steps 3-5 until help arrives or object comes out



Recovery Position



Handover to EMS

- Incident Report Form
- Provide Age and Sex of patient
- Describe incident and chief complaints
- Report vital signs & examination results
- Report interventions provided
- Good Samaritan Bill
- DNR – Do Not Resuscitate
- AND – Allow Natural Death

PTSD & Stress Debriefing

- Denial “Not me!”
- Anger “Why me?”
- Bargaining “Okay, but”
- Depression
- Acceptance
- **Stress Management**
 - Prevent
 - Recognize
 - Reduce Critical Incident Stress

S-A-M-P-L-E

- **S** – Signs & Symptoms
- **A** – Allergies (Food, Medicines)
- **M** – Medications
- **P** – Past / Pertinent Medical History
- **L** – Last Oral Intake
- **E** – Events leading to present condition

O.P.Q.R.S.T.A

- **O** – **Onset** – Sudden, gradual
- **P** – **Provocation** – Aggravated / relieved by
- **Q** – **Quality** – Stabbing, colicky, burning
- **R** – **Region / Referral / Recurrence / Relief**
- **S** – **Severity** – On a scale of 1-10
- **T** – **Time** of Onset of symptoms
- **A** – **Associated** Symptoms: Nausea, Vomiting

S-T-A-B-L-E

- **S** – Sugar (Hypo/hyperglycemia)
- **T** – Temperature
- **A** – Airway
- **B** – Blood Gases
- **L** – Lab Works
- **E** – Empathy

Recognition of Death

- It is inappropriate to commence resuscitation when following indicators of **Death** are present.
 - Decomposition
 - Rigor mortis
 - Incineration
 - Decapitation
 - Pooling of blood
- Other injuries incompatible with Life

CPR Protocols

- Child less than 18 Years
- When Advanced Medical Care is within 15 minutes away
- Pregnancy
- Hypothermia: "You're not Dead until you're Warm and Dead"
- In case of Near Drowning
- If one Rescuer decides to continue
- Single handed up to 15-20 minutes?

When to STOP(s) CPR

- **S** – Patient **Starts** Breathing and has a pulse
- **T** - The patient is **Transferred** to another person trained in BLS, ALS
- **O** - You are **Out** of Strength or too tired to continue
- **P** – **Physician** gives direction to discontinue CPR
- **S** - The **Scene** becomes unsafe