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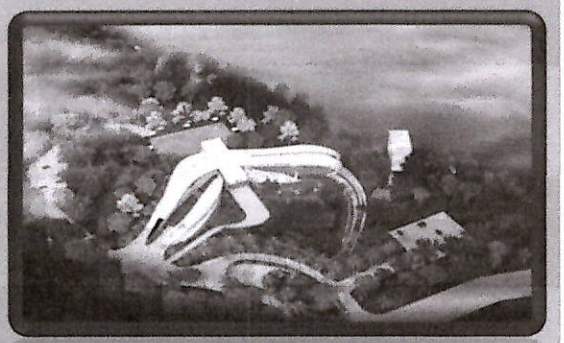
NATIONAL INSTITUTE OF WATER SPORTS

LIFE SAVING TECHNIQUES – POOL LIFEGUARD

National Institute of Water sports based at Goa, was setup by Ministry of Tourism, Govt. of India in 1990 as Independent Institute but afterwards it was brought under the Administrative control of Indian Institute of Tourism and Travel Management (IITTM) in 2004. The Institute has been modeled as Nodal agency to conduct all matter pertaining to leisure water sporting, Lifeguarding and issuing License for different watercrafts and water based activities in all over country. The Institute has been conducted other activities like:

- Safety Audit of Water sports clubs
- Feasibility report to setup new water sports club
- Inspection of Parasailing Operations & SCUBA divining centers



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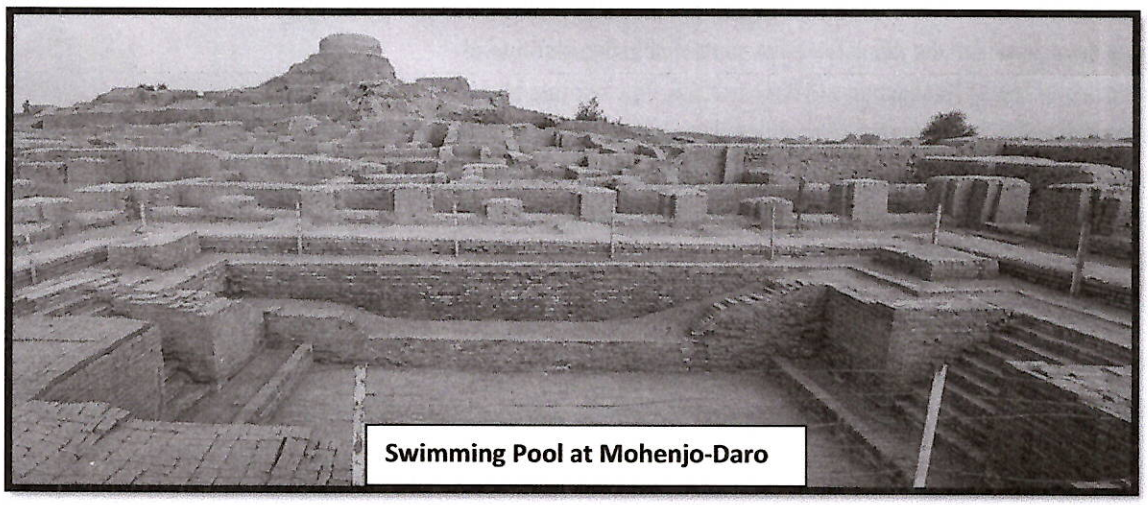
LIFE SAVING TECHNIQUES – POOL LIFEGUARD

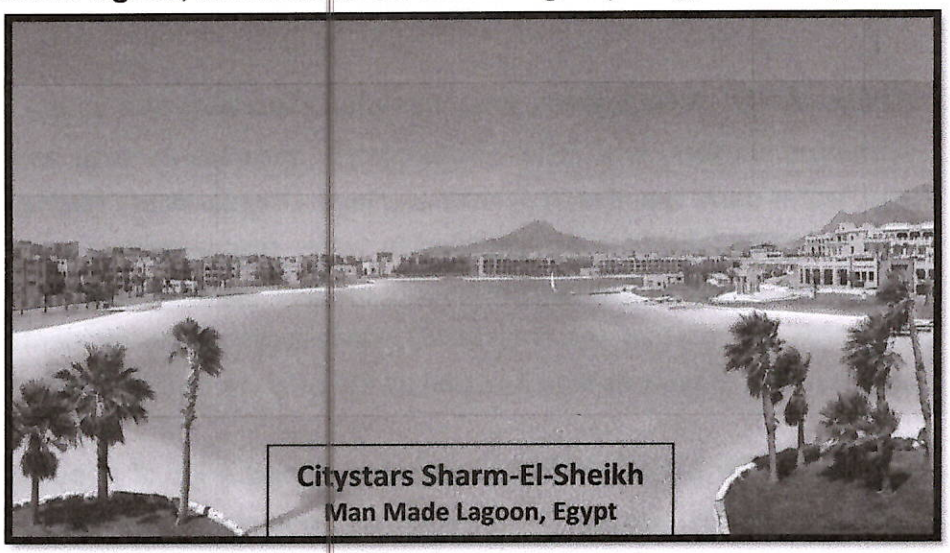
1. **SWIMMING POOL:** A pool is a container filled with the water intended for swimming or water based recreation. There are many standard sizes and shapes. A pool can be built either above or in the ground and from materials such as concrete, metal, plastic or fiberglass. Pools that may be used by many people or by the general public are called public pools, pools can be used by the following:
    - In a home are called private.
    - Many health club and fitness centers used mostly for Exercise.
    - Many hotels have pools for their guests.
    - Hot tubs and spas have pools with Hot water for their customer's relaxation.
    - Pools are used for recreation, diving, Lifeguards training and watersports.

2. **HISTORY:** The world's first swimming pool was at the site of MOHENJO - DARO (presently in Pakistan) during 3rd millennium BC. This pool is 12 x 7 mtr. is lined with bricks and was covered with a tar based sealant. After that ANCIENT GREEKS and ROMANS built artificial pools for athletic training in the Palaestras for nautical games and for military exercises. Swimming Pools become popular in Britain in the mid-19th Century. After the modern Olympic Games began in 1896 which included swimming races, the popularity of swim pools began to spread. In 1839 Oxford had its first major pubic indoor pool at Temple Cowley and swimming began take off. The Amateur Swimming Association was founded in 1869 in England.



Swimming Pool at Mohenjo-Daro

According to the Guinness World Records (2015) the largest man made lagoon in the world is **Citystars Sharm El Sheikh** Sea water lagoon in Egypt. It is **12.5-hectare lagoon**, which allows for swimming, kayaking, and sailing.



An Olympic Sized Swimming Pool first used at the 1924 Olympics and FINA's sets the additional standard for the Olympic Games and for world Championship events. It must be 50m (160 ft) Length by 25m (82 ft) wide divided into eight lanes and dept of 2 mtrs. And Semi Olympic size swim pool is 25 mtr. length by 12.5 mtr wide divided in eight lanes. For training pool depth should range from 1 mtr to 6 mtr.

3. **TYPES OF SWIMMING POOL:** There are four types of swim pool in International level.
    a. L shape
    b. T shape
    c. U shape
    d. I or Rectangle shape

4. **WHAT IS LIFE SAVING:**

Life Saving is the act involving rescue, resuscitation and first aid. It refers to water safety and rescue from Swimming Pool, flood, Sea, Water park, River, where Life Saving skills, speed and team work include. Person who participate in Life Saving activities as a volunteer are called life savers. The goal of Life saving is to protect

the general public with vigilance and service in Aquatic environments by trained personnel offering preventative advice and safe bathing area.

Life Saving is divided in two parts:

a) Rescue – the victim from Danger Place to Safe Place
b) Recovery – provide First Aid or CPR to the victim as per his condition

5. **LIFEGUARD:** A lifeguard is a rescuer who supervises the safety and rescue of swimmers, surfers, and other water sports participants such as in a swimming pool, water park, spa, beach or river and lake. Lifeguards are strong swimmers and trained in CPR/AED first aid, certified in water rescue using a variety of aids and equipment depending on requirements of their particular venue. In some areas, lifeguards are part of the emergency services system to incidents and in some communities, lifeguards may function as the primary EMS provider.

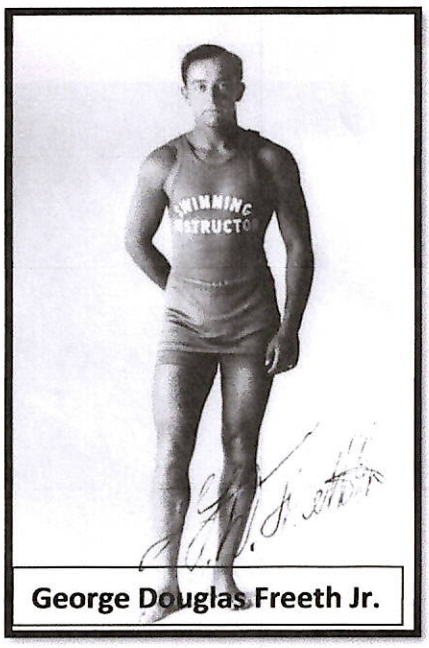
6. **HISTORY OF LIFEGUARD:** Swimming gained a lot of popularity in the 19th century in the US. Resorts started popping up in places like Atlantic City and New Jersey. These resorts had huge swimming pools and other recreational activities in the water to help people escape from the heat of the summer. However, as the popularity of swimming increased so did the incidence of drowning. The American Red Cross estimated that in the early twentieth century around 9000 humans drowned each year.

In order to solve the drowning predicament, these resorts installed lifelines. But, these lifelines were of no help because swimmers were unable to get a hold of them. After lifelines, came rescue boards. Duke Kahanamoku was one of Hawaii's first watermen. He introduced the rescue board around 1915.

Some other communities decided to assign police officers to rescue drowning people from the water. However, using police officers proved to be a problem because it used up law enforcement resources. Eventually, local governments began to hire people that were explicitly trained for water rescue. These men and women started to go by the term "lifeguards."

In 1912, the Young Men's Christian Association (YMCA) developed a National Lifesaving Service. Soon after, in 1914, the American Red Cross Lifesaving was established. This service trained swimmers in lifesaving and CPR. Once these swimmers were prepared, they were sent to work as lifeguards in their local communities. Soon enough, lifeguards became an esteemed and challenging career choice.

7. **FIRST LIFEGUARD:** In 1908 George Douglas Freeth Jr. established the first lifeguard training at Redondo Beach, California.



8. **WHY NEED TO DO THE LIFE SAVING COURSE:**

Casualty of a person can effect on the following:

a) Family Members
b) Workplace/Business
c) Friends
d) Society

9. **BASIC AIM OF LIFE SAVING:**

- To save a life
- Bring Medical help As Soon As Possible
- To avoid the infection like Aids, Hepatitis B.

10. **BASIC OF LIFE SAVING:**

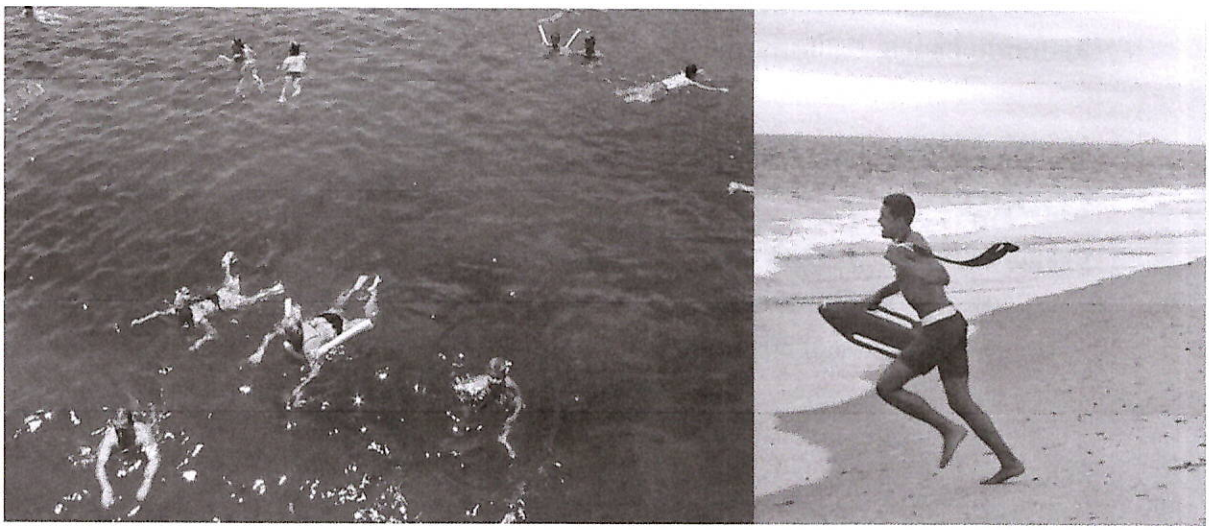
a. **Awareness** – To have the awareness of place for any danger where rescue is to be performed and also have awareness of Rescue, First Aid and CPR procedure.
b. **Assessment** (when, who, why) – When the victim is in danger, always assess the situation and the victim for the reason of being in danger and accordingly make the plan for rescue as per available equipment.
c. **Action** – Rescue the victim from danger place to safe place.
d. **After care** – Provide First Aid/ CPR as per the victim's condition and give comfort.

11. PRIORITY OF SAFETY:

a. **Safety of Life Saver** – Always keep safety of self before going for rescue by accompanying with any floating aid.

b. **By stander of friends and relatives of victim** –Ask the by standers or the relatives of victims' to stay away from the person in danger and the area.

c. **Victim** – Last priority is to be given to the safety of the victim by attempting rescue.



12. QUALITY OF LIFEGUARD:

(a) Good swimmer
(b) Physical fitness
(c) Alert in work place
(d) Trained professionally
(e) Good First Aider/ CPR Aider
(f) Appropriate Rescue Skills
(g) Good communication skills
(h) Confident
(i) Neatness and cleanliness
(j) Sun smartness (dress)
(k) Presentable

13. 10/ 20 RESCUE STANDARD.

10/ 20 protection rule means that you must able to detect the distress person within first 10 sec. and you have 20 sec to reach the person and render aid.

- 10 sec for assessment
- 20 sec to approach and rescue the victim

14. **SCAN:** As you diligently watch your zone, your eyes need to move in regular patterns to be sure you look at each area. There are two methods to scan the water:

a. **Standard scan**: Scan should start on surface.
   - Count the head in water
   - Standing outside water
   - Children count separately

b. **3'D scan:** This scan is mostly performed in swimming pool.
   - Scan should start from the bottom.
   - Scan mid of water
   - Scan on the surface

15. **ZONE:** No compromise, no matter the circumstances is known as diligence. When lifeguarding, you will have a specific area assigned to you, that is your zone. This will also be your area of responsibility and it will be different for each guard zone at your facility.

16. **DROWNING:** Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid; outcomes are classified as death, morbidity and no morbidity. When a person find himself in difficulty or suffocating and imminent danger of death occur within seconds in the water. He loses his ability to struggle with the water and promptly sinks in to it.

Key Facts as per World Health Organisation:

- Drowning is the 3rd leading cause of unintentional injury death worldwide, accounting for 7% of all injury-related deaths.
- There are an estimated 320 000 annual drowning deaths worldwide.
- Global estimates may significantly underestimate the actual public health problem related to drowning.
- Children, males and individuals with increased access to water are most at risk of drowning.

There are two categories of drowning:

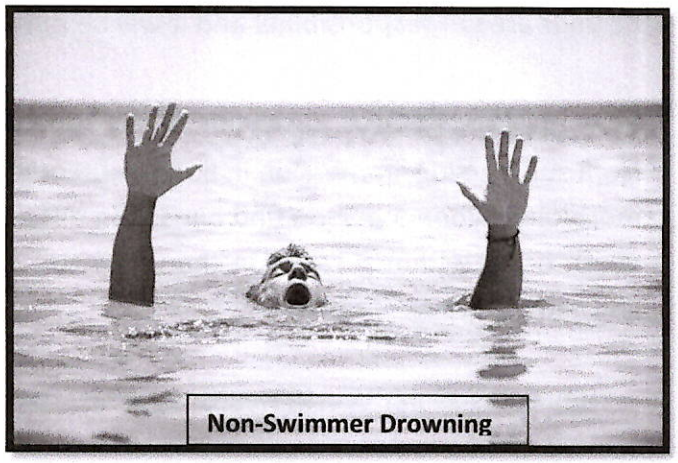
a. **Passive Drowning**: Those people who are semi swimmer/ swimmer, they suddenly sink or have sink due to an accident, medical condition and sudden loss his consciousness. (Injured person, fits and showing extraordinary skills in water).

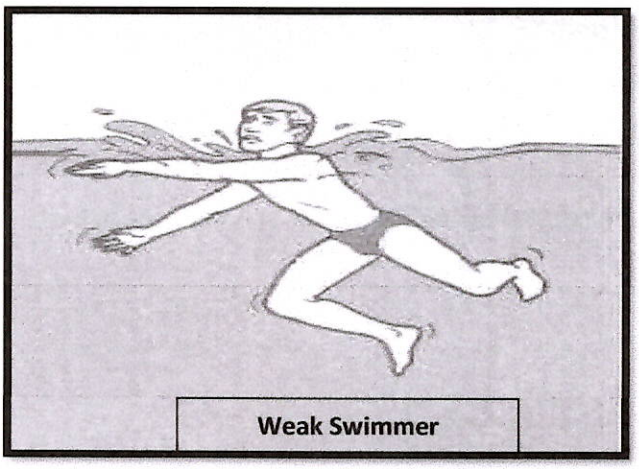
b. **Active Drowning**: Some people who are non-swimmer and they feel exhaust or suffocate before enter the water or they get afraid of water, who are unable to hold the mouth above the water and are suffocating due to lack of air, who hold the breath intermittently before entering the water. This type of people drown very quickly and silently or unable to call for help and reach to rescue equipment.

17. **TYPES OF DROWNING VICTIM AND SYMPTOMS:** Drowning can occur within second at any time or anywhere in the water. The drowning is common with the non-swimmers who are unable to swim or afraid of water and due to strong wave unable to swim in one direction.

Symptoms of drowning are as follows:

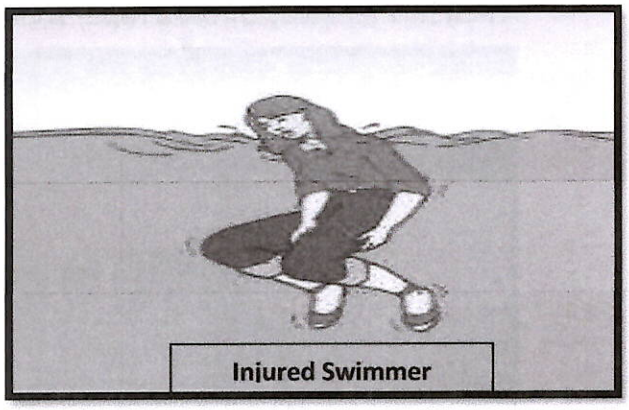
a) **Non-swimmer:** Head low in the water, mouth at water level, vertical position, movement upward and downward, try to climbing. Head tilted back with mouth open.

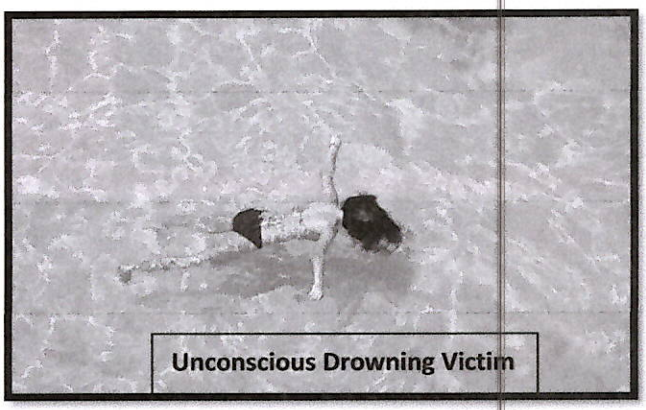

Non-Swimmer Drowning


Weak Swimmer

b) **Weak swimmer:** Due to strong wave of water unable to swim in one direction, saluting position on water, sometime can see his legs, shifting the position in water.

c) **Injured swimmer:** Due to any problem he feels breathlessness/giddiness or block out and unable to focus. He will hold that part where he gets injured and ask for help.


Injured Swimmer


Unconscious Drowning Victim

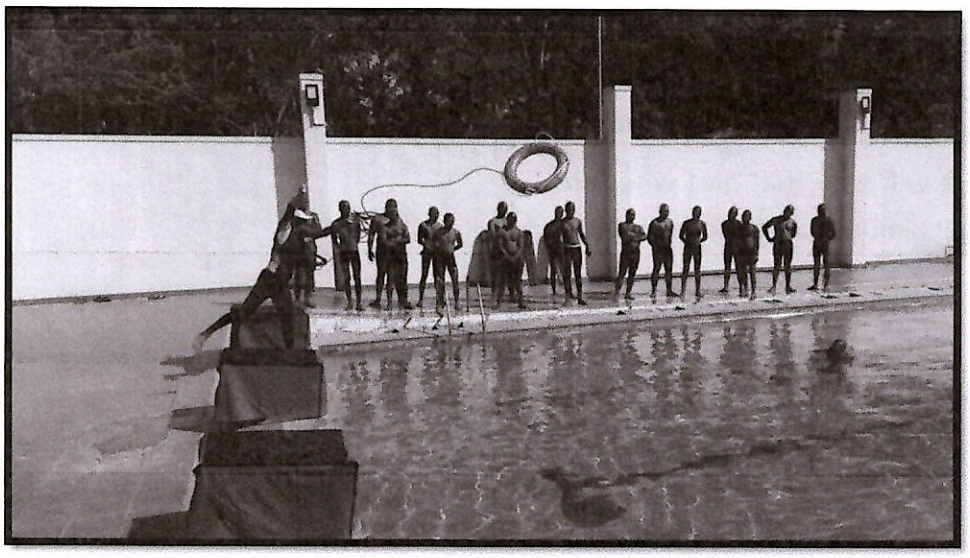
d) **Unconscious:** He never takes breath. He is flat on water or bottom.

18. Rescue Procedure - Reach, throw, row and swim:

The methods of rescue should be considered in this order i.e. Reach, Throw, Row and Swim.

❖ When victim is near the bank then try to reach him by giving any pole or bamboo.

❖ When further away throw a rope/ rope with lifebuoy.



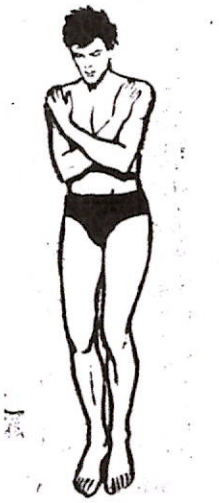
❖ When long way out Row if possible or use power boat or PWC.

❖ Otherwise provided you can swim well, Or if trained life saver as last resort swim and rescue with tow (preferably with taking floating aid)

19. Rescue Procedure with Swim

A. Entry in the water: The first step making an effective rescue is entering the water in an efficient and safe way.

There are two ways for entering in the water i.e. Jump and Run-wade-plunge dive. If the rescuer is at the height from water, then he will have to jump and if he is near the shore then he can enter by run-wade-plunge dive method.



i. **Compact Jump entry**: The compact jump entry with rescue tube is used to enter the water to do a rescue. If the water conditions are unknown, a caution fit first is safest and entry from height is unavoidable, should fit first. You must keep your eyes on the victim while preparing to Jump.

a) Put the rescue tube strap on diagonally across your chest.
b) Gather the strip / rope in some manner so that it will not hook into anything as you jump.
c) Bring the rescue tube up across your chest, reach over the tube under the both armpit and press it towards the chest and lock it.
d) Jump from pool deck or floor, keeping legs together with flat feet.
e) As reach the water, bend the knee as if you are sitting in a chair and put head forward down.

ii. **Straddle Jump**:

a) Spring forward in to the water your legs spread wide apart to the front and back.
b) Flex your knees slightly and lean forward to an angle of about 40°.
c) Extend arms side ways and slightly forward and little bend the elbows.
d) Keep head in line with the body.
e) When you enter the water press the arms down wards to keep the head up and keep eyes on victims.

B. APPROACHING, RESCUE AND LIFE SAVING STROKE:

Approach stroke can be any combination of leg kicks and arm movements that allow making the fastest forward progress in the water. The most effective kicks for most lifeguards will be either the breast stroke kick or the flutter kick, combined with either the breast stroke or crawl stroke.

i. Non-Contact Tow (using an aid)

As per International Life Saving Federation and National Institute of Water sports guidelines, it is strongly recommended to Save the Life of any person with Non-Contact Tow only. Used with a conscious and unconscious person with the following aids:

a) Rescue Tubes (front huggie and rear huggie)
b) Life buoy with the rope.
c) Reach out pole and Wooden bamboo.
d)Throwing the rope.

There are two types of approach strokes:

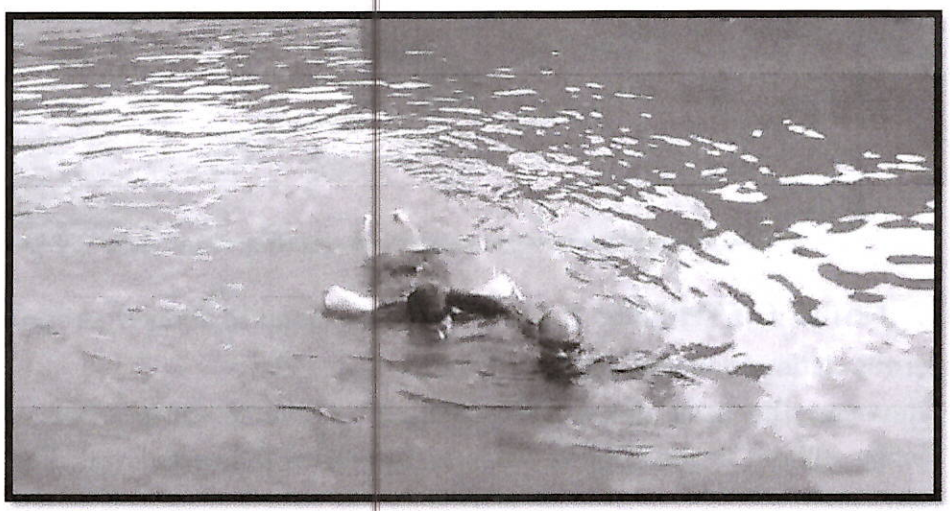
a. Head up front crawl or freestyle
b. Head up breast stroke

How to Rescue with Rescue Tube:

- Keep the rescue tube in front of your chest under armpit between you and the distressed victim at all times and Approach with Head up Breast or Head up Front or Crawl stroke to rescue the conscious victim with **Front Huggie** and unconscious victim with **Rear Huggie.**
- Always keep your eyes on the distressed victim at all times.

Towing method/ Lifesaving Stroke:

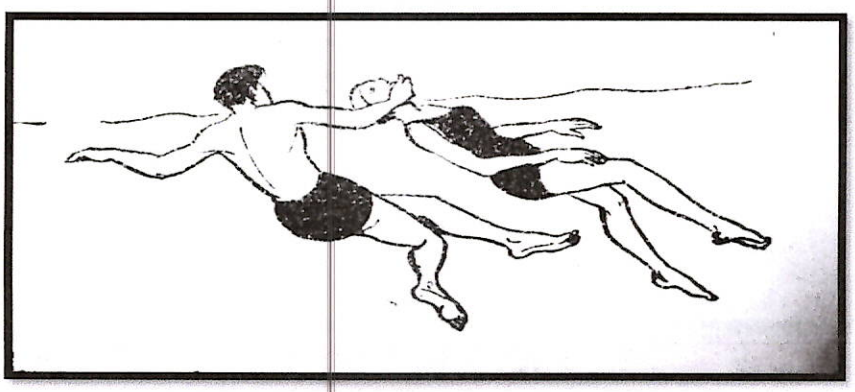
a. Side Stroke
b. Survival Back Stroke or Life Saving Back stroke



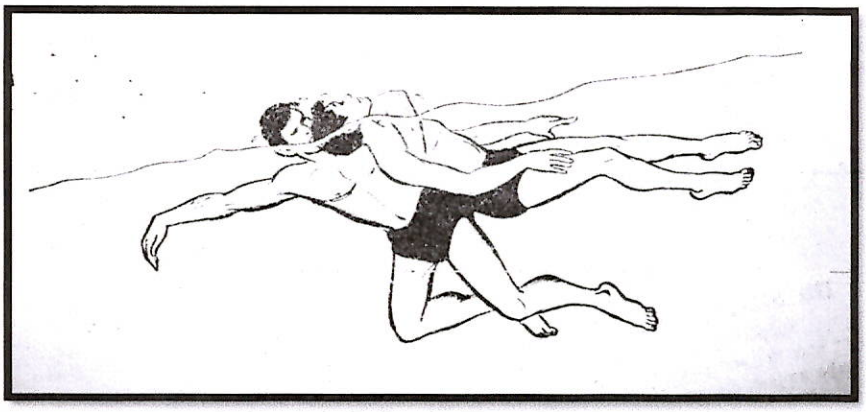
There are number of ways of towing a person through the water and will have to decide, depending on whether he is conscious, unconscious or injured with all tows keep the subjects face clear of the water.

ii. **Contact Tow:** Used with a person needing firm control.

a) Chin Tow – From behind, pass arm over the control subject shoulders, up his chin with one hand with head rest on rescuer shoulder and use side stroke.



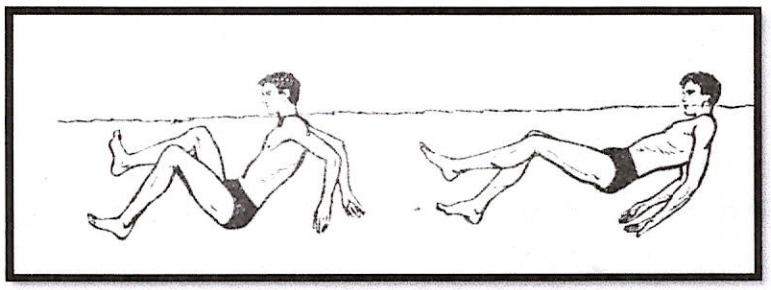
b) Chest Tow: Grasp one arm over the subject chest and under arm pit with side stroke. While swimming keep his mouth clear from the water, to take the breath.



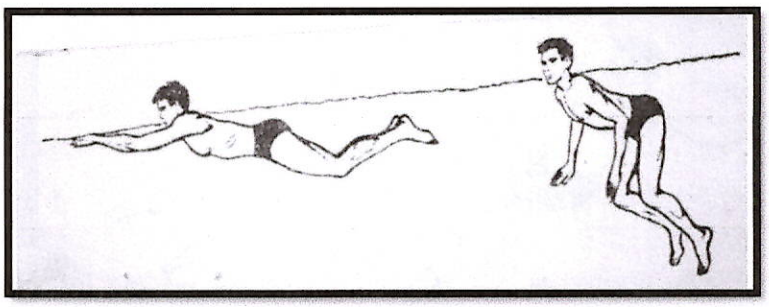
20. **DEFENSIVE METHODS:** These skills are designed to allow the rescuer to stand off a dangerous victim or avoid a sudden clutch.

a. **Reverse:** The basic defensive technique or reverse the position of the body while still out of the subject reach and to move the rescuer quickly away from danger.

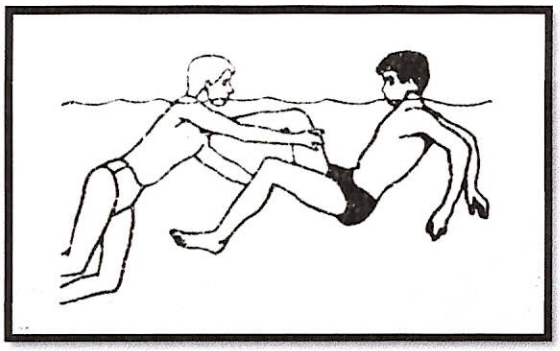
Approach: From front



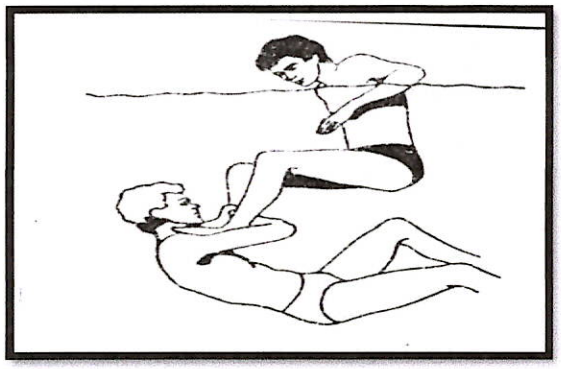
From Reverse



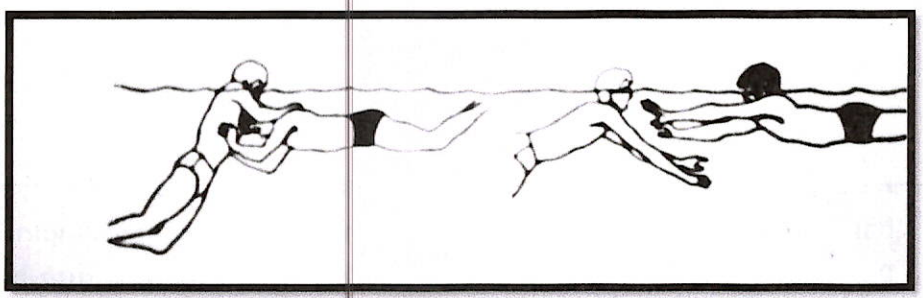
b. **Single leg block:** If the subject within range when attempting a clutch, as you reverse block and attempt by thrusting against his shoulder or chest with one leg.



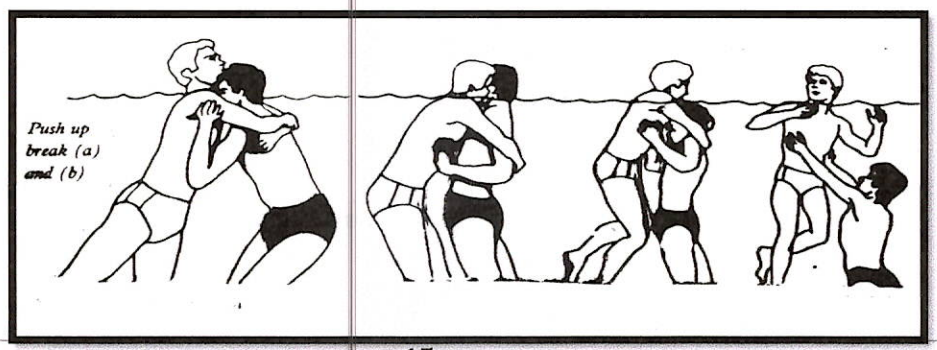
c. **Counter**: Used if the leg is grasped while attempting a single block. Pull the subject under water using the grasped leg and move over the top of him. When he is below go behind, turn and lift him into a chin towing position.



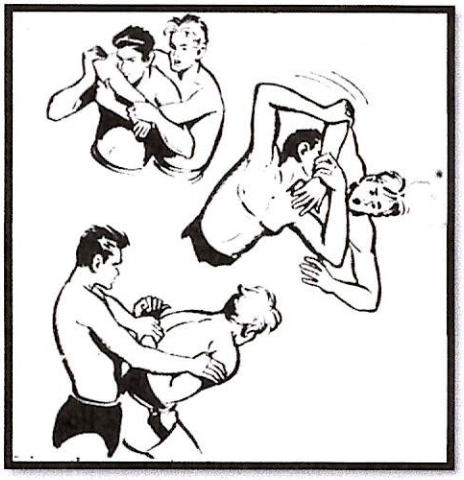
d. **Duck away:** To avoid a sudden clutch at close quarters immediately, first take him into the water, lower your head and push upwards with your hands against his hips, waist, chest or arms with pinch forcing him away.



e. **Push up Break**: Used when the rescuer is seized from the front:
If the head and neck are clutched, first take him in to the water, push him upward from his elbows or pinch him on the chest above both nipples. While submerged turn the subject to a towing position.

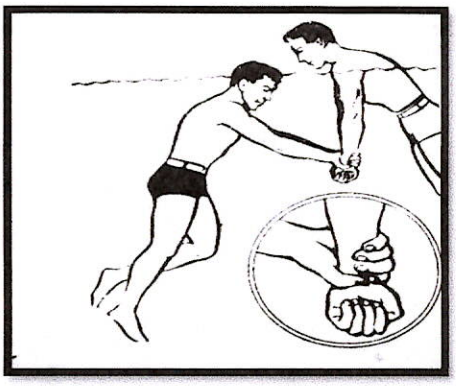


f. Elbow Break: Used against clutches above the rescuer elbows:

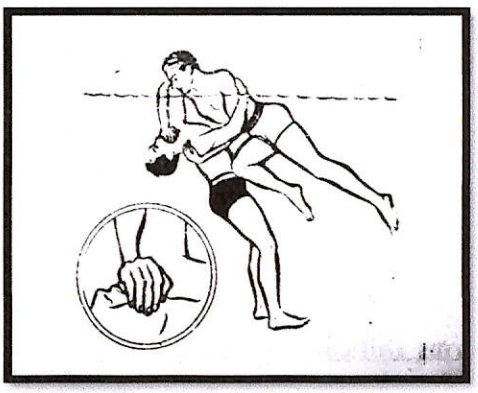


Droop your chin quickly on to your chest to protect your throat. Grasp one wrist with your apposite hand (left wrist – right hand) then the force the elbow up and pull downwards and inwards on hand. Head away from the elbow you are forcing up and duck underneath his arm, pull his wrist until you have turned it behind his back, turn him to towing position.

g. Held By The Wrists: Straighten and raise both arms above the head bringing them down and together in front of the body. At hip level sweep them out against the thumbs of the subject and turn to towing position.



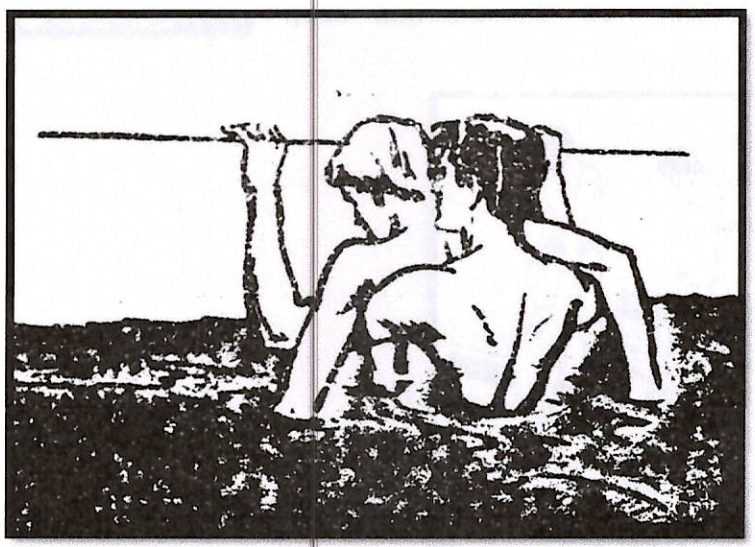
h. Held By The Neck: Take a deep breath and get well over the subject. Place one hand on his back and other hand palm on his chin, fingers clamping the nostrils. Pull hard towards and same time push his neck back and turn him to towing position.



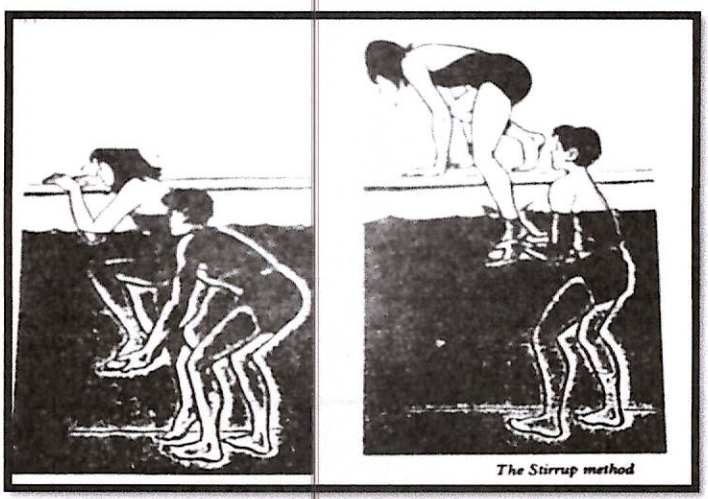
21. LANDING A RESCUED PERSON:

How a rescued person is taken from the shallow/deep water will depend on whether he is conscious, unconscious or injured and landing place is shelving or steep. If the landing place is shelving can be assisted to walk out, if he is unconscious let them to float on the back, with hand support.

a) **Support position:-** Keep the suspect face out of water and firm grip on the edge under the arms pits, push with legs from victim seat and let them to come out with rescuer foot support.

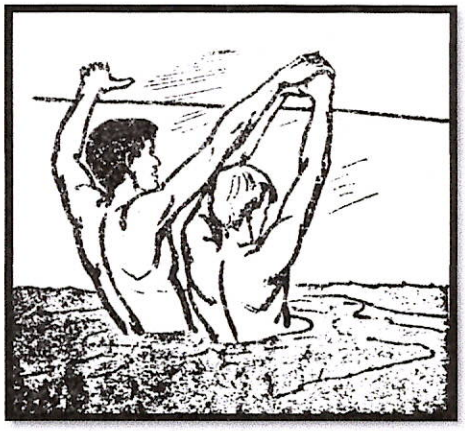


b) **Stirrup method:-** When the subject able to give some help support him against the side, bend down, put your free hand under his foot and push upward and allow him to put his foot or knee on the edge and give him a help to come out of water.

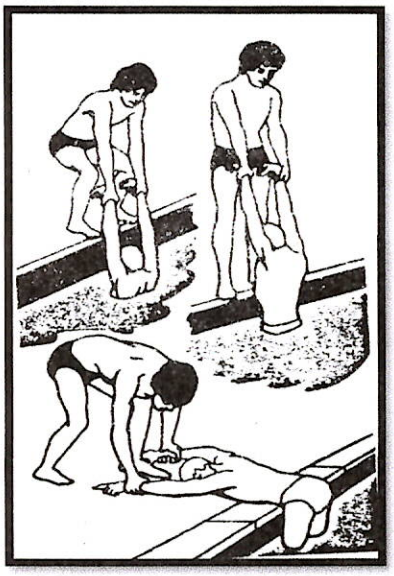


The Stirrup method

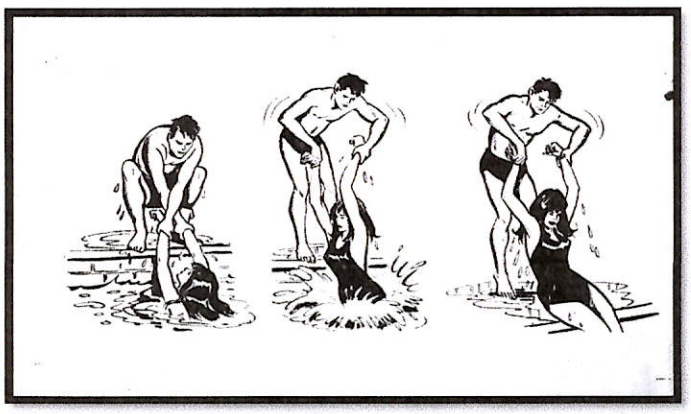
c) **Landing:** - Rescue First:- When the subject is unable to help, the rescuer places his hands on the top one above other, hold him their with his face above the water while climbing out. There are two methods of getting out unaided.



d) The straight arm from shallow and deep water.

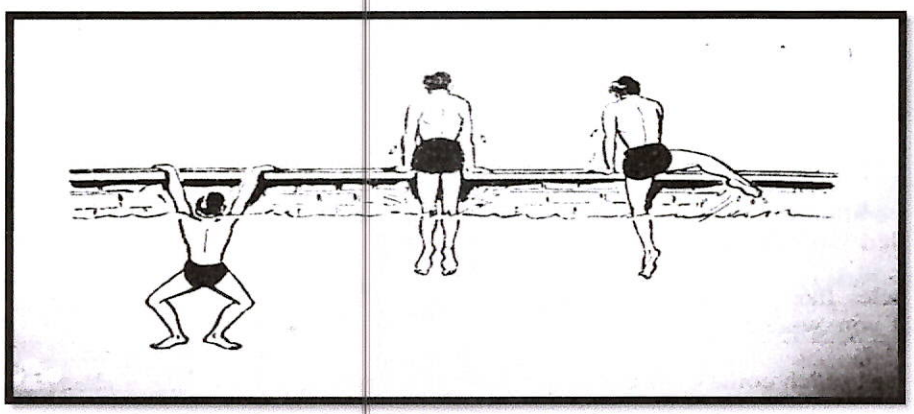


e) The crossed arm from deep water only.



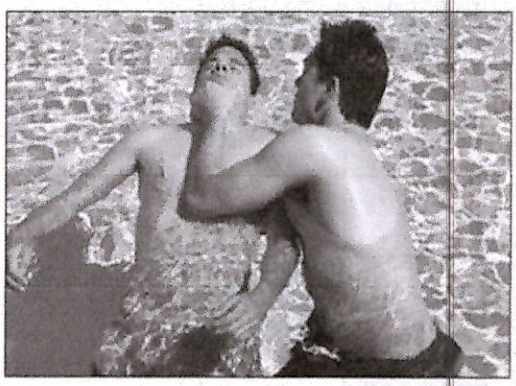
Leaving the water without assistance.

How to come out from the water, place your hands on the edge and with the help of a breast stroke kick or push off from the bottom, pull yourself up until your arms are straight and you can get one leg over the top, from which position you can easily climb out.



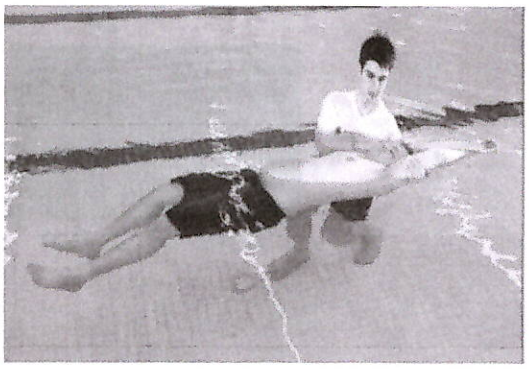
22. SPINAL MANAGEMENT:

Head, Neck and Spinal Cord Injuries



Place one hand on the victim's lower jaw and the other hand on the back of the lower head.

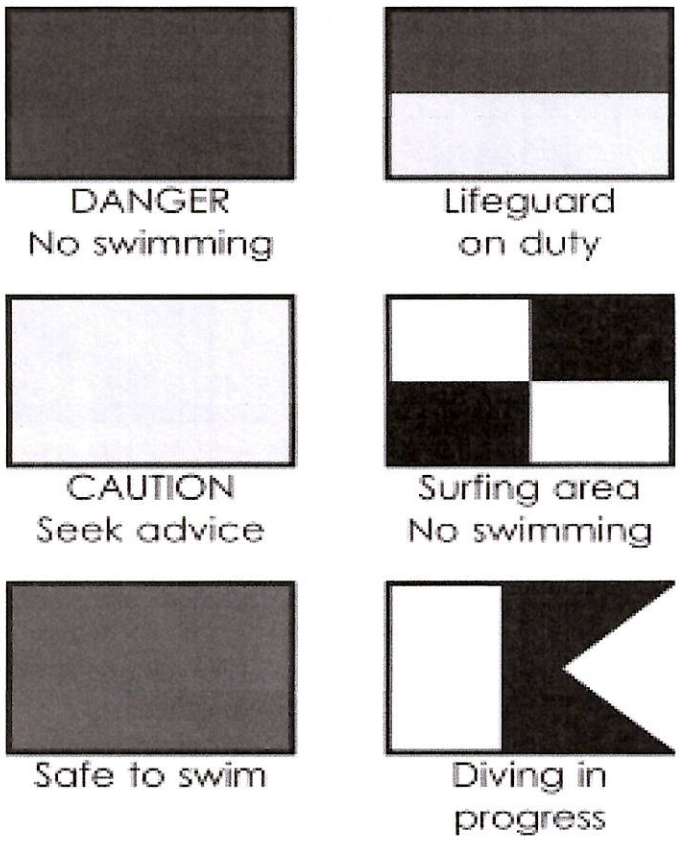
Be careful not to place pressure on the neck or touch the front or back of the neck.



23. COMMUNICATIONS: Effective Communications are vital for Lifeguard and they may choose to use whistles and Flags.

a. <u>Flags</u>

A more traditional method of Communication with the public is through the use of colored flags which can be raised over permanent or temporary to inform the members of different information.



b. Whistle:

More often than not a whistle is used in the Pool Leisure facility the following signals are used:-

One Short Blast: Used to gain the attention of a swimmer.

Two Short Blasts: Used to gain the attention of a fellow Lifeguard or occasionally a Manager/Head Lifeguard.

Three Short Blasts: Used to signal to a fellow Lifeguards that an Emergency is taking place, action must be taken.

One Long Blast: Used to signal to Swimmer that they must clear the Pool, this could be because the Pool is closed or an emergency need Lifeguard to clear the Pool and Activate the EAP (Emergency Action Plan).

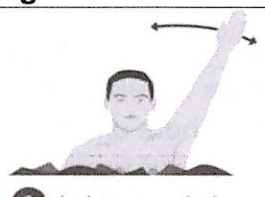
c. Hand Signals:

In general hand signals were divided into the following general classifications:

i. Communication from the beach or pool deck to a lifeguard in the water,
ii. Communication from the lifeguard in the water to lifeguards on the beach or pool deck

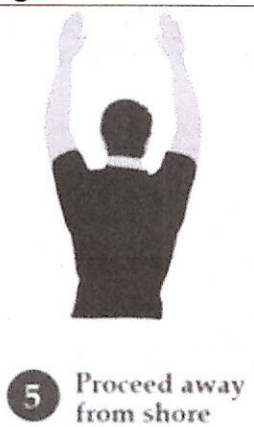
The hand signals could also be classified as follows:
i. Those relating to a search and/or rescue situation
ii. Those providing direction to the lifeguard

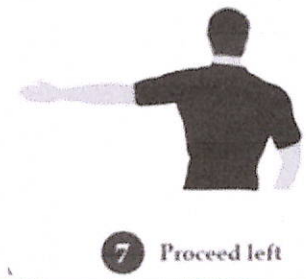
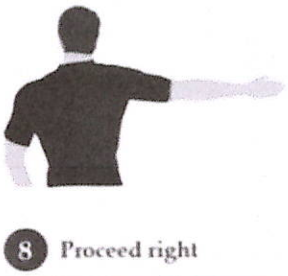
i) **Search and Rescue signals**

Signal	Action	Meaning
	One arm waved to and fro above the head	The lifeguard in the water needs further assistance. This may be due to a badly panicky patient, multiple patients or an injury to the lifeguard sustained in the response. Backup by rescue craft or other swimmers is required immediately
	Both arms raised to form a cross above the head	This is the most serious signal of all. A swimmer is missing and presumed submerged. Other lifeguards on shore or the pool deck should immediately fix the position of the lifeguard and initiate an appropriate response.

 3 All clear/okay	Touch the middle of the head with the fingertips of one hand	The lifeguard is indicating that no help is required in performing the rescue and that the patient is stable. However, other lifeguards should continue to observe and monitor the situation as the situation can deteriorate
 4 Pick up patient	One arm waved in a circular manner above the head and the other arm held parallel to the water's edge and horizontal to the ground.	This signal indicates that swimmers are in need of rescue. Once the signal is acknowledged direct the lifeguard to the swimmers (see directional signals)

ii. Directional signals

Signal	Action	Meaning
 5 Proceed away from shore	Two arms held vertically above the head	The lifeguard in the water should move further out to sea or away from the pool deck from where the lifeguard giving the signal is standing
 6 Proceed towards shore	One arm held vertically above the head	The lifeguard in the water should move towards the shore or closer to the pool deck towards where the lifeguard giving the signal is standing

 7 Proceed left	One arm held parallel to the ground and pointed in the required direction (left)	The lifeguard in the water should move in the direction indicated (left)
 8 Proceed right	One arm held parallel to the ground and pointed in the required direction (right)	The lifeguard in the water should move in the direction indicated (right)

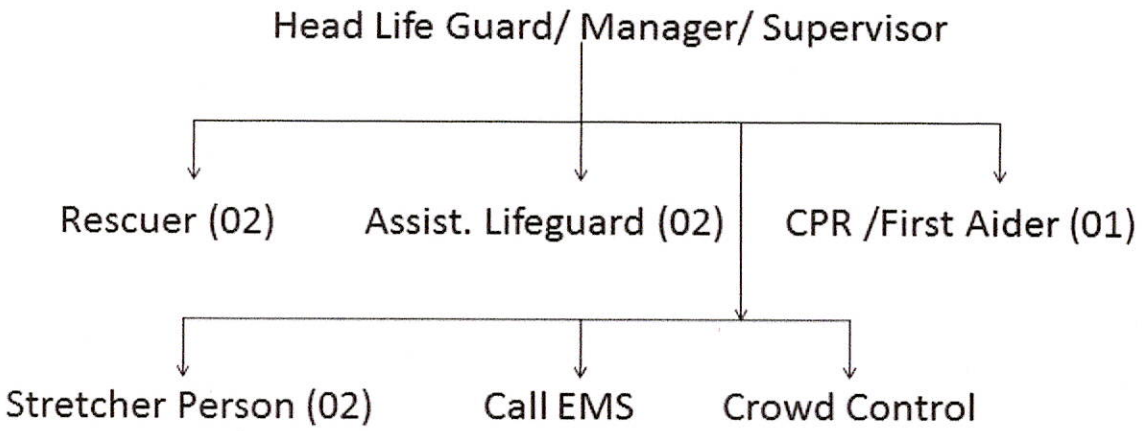
24. Emergency Action Plan (EAP):

When you recognize an aquatic emergency, you will respond quickly with chain of events to help the lifeguard to handle the situation in the best manner possible. Emergency Action Plan designed specifically for aquatic facility in writing and they must take action as per plan and role of each member.

EAP need to be read, discuss and practice once a week. The EAP should be activated by the Watersports Manager, Supervisor or Head lifeguard when recognize the emergency by blowing whistle through one long blast.

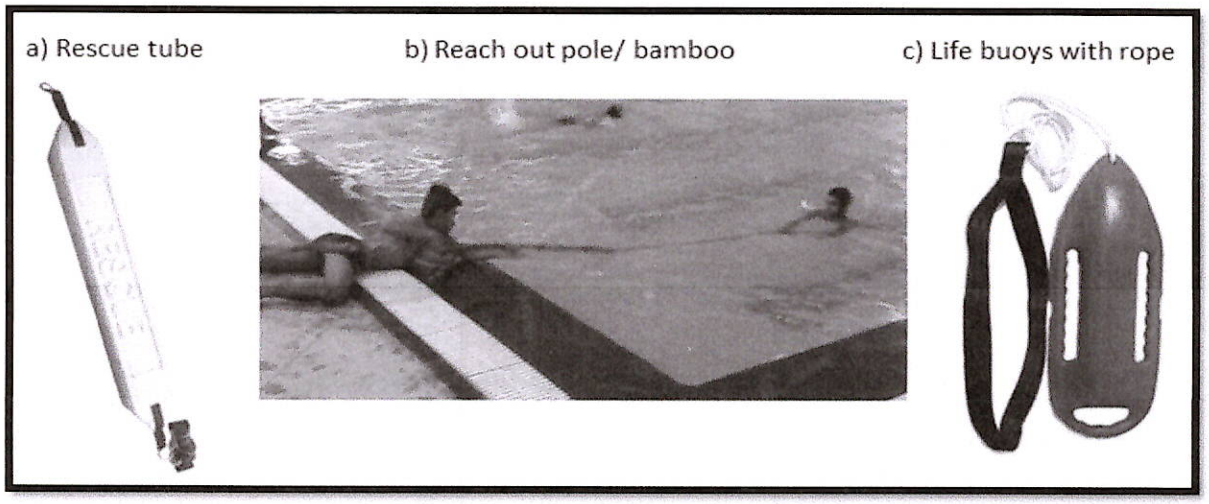
- At the time of activation of EAP all lifeguards attention for assistance, rescue on emergency care.
- The nearby lifeguard is responsible for Zone/ area, for who is making the actual rescue. So other lifeguard can watch the zone/ area or clear area instead and be ready to assist the rescuer.
- If the situation is more serious, other lifeguards, supervision staff and medical personal may become part of EAP team.
- All team members must know their role and responsibility in an emergency.

Layout Chart of EAP is as follows:



- The EAP regular practice met successfully prevent drowning and more effective.

25. LIST OF RESCUE EQUIPMENT AND ACCESSORIES:



b) Personal Lifeguard accessories.

i) Uniform with Red & yellow colour with printing (Lifeguard)
ii) Whistle with lanyard
iii) Cap and sunglass
iv) Loud hailer

c) First Aid Kit :

i) First Aid Box ii) Stretcher

iii) Pocket mask iv) Ambuse bag

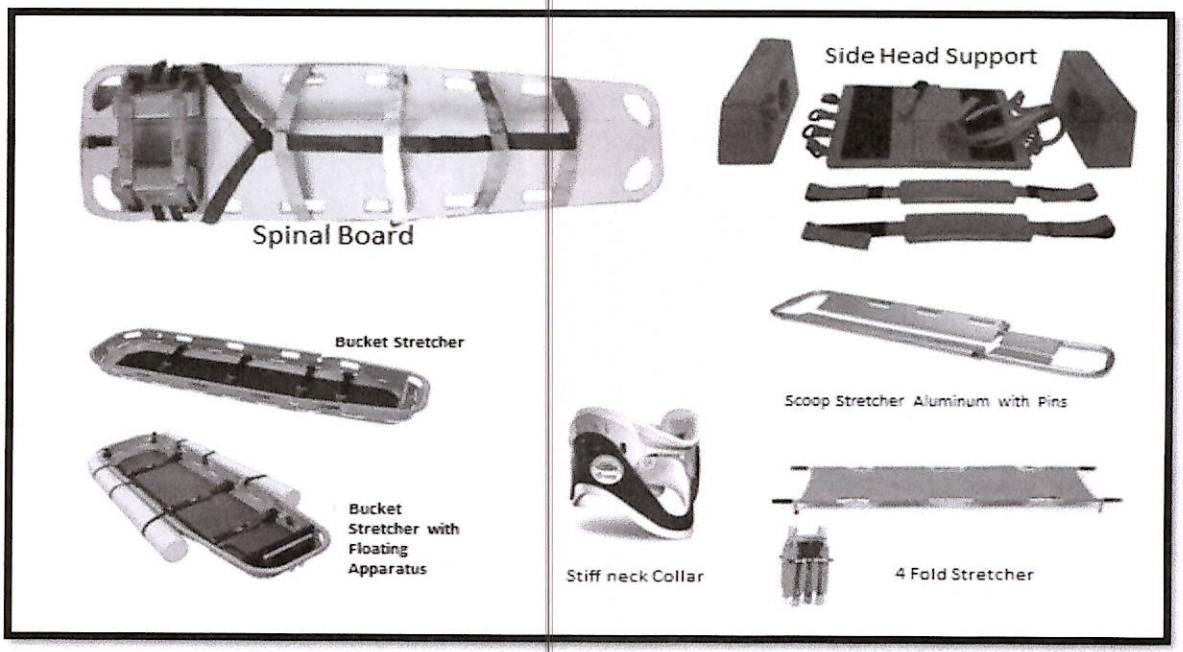
v) Portable oxygen equipment vi) Blanket

vi) Surgical hand gloves and face mask.

d) Special first Aid gear :

i) Spinal backboard or spine board with accessories

ii) Stiff neck spinal brace.



a) Support infrastructure: Telephone, Information/ warning boards Incident report forms

26. RISKY GUEST/ CUSTOMER:

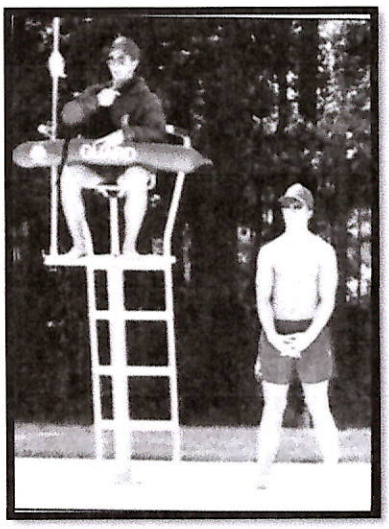
a) Drunken Alcohol
b) Show off
c) ill disable
d) Senior citizen
e) Kids
f) Bikini girls
g) Obese Person
h) Inappropriate clothing (Saree)

27. RISKY SITUATION:

a) Large no's of people enter into the water at a time.
b) Sudden Change in weather condition.
c) Changing the shift of all water sports duty employees.

28. **LIFE GUARD ROTATION:** The lifeguard rotation is very risky during swim pool in progress. Lifeguard should change the shift while scanning the standard scan.

a) Incoming guard report and start watching the respective zone.



b) Outgoing guard give Aid and get down from the chair and start watching the zone by the time incoming guard take place on the chair and start scanning.

c) Outgoing guard leaves only after incoming guard is ready with the Aids and has assured zone responsibility at same time do the standard scan followed by 3D scan and must count heads in the water.

29. DUTIES OF LIFE GUARD IN SWIM POOL:

The life guard on the swim pool has lots of important duties which has to be performed in effective manner.

a) Maintain the order at the pool facility in order to prevent the accidents from unsafe conditions to provide the first aid to patrons.
b) To maintain the rules and regulations as per standing order or policies.
c) Carry out all duties assigned by the swimming pool manager and head Life guard.
d) Should be able to give first Aid and CPR during any drowning case.
e) All safety precautions should be taken during swimming at pool.
f) Before training the patrons, watch that area to prevent any injuries or accidents.
g) To assist the pool manager and assistant manager in every way to run the facility very smooth.
h) To maintain the documents i.e. daily attendance register and section sweeping register.
i) Report all disciplinary problems and accidents to the manager and assistant manager.
j) Inform the manager or head Life guard when equipment need to repair.
k) Supervising swimmer and given advice on water safety.
l) Conduct the lecture for Life Guard once in a month on water rescue practice and first aid including CPR drill.
m) Lifeguard should be part of EAP and know their role and responsibilities.

30. LIFE GUARDING INSTRUCTIONS:

a) Duties should not exceed 4 hrs at a time.
b) Area under observation should not exceed 30 mtr. More than one observation post must be provided for longer/ bigger swimming pools or water parks.
c) Lifeguard on active duty should not be distracted by giving them any other jobs.
d) Should know the standard communication signals.
e) Emergency Action Plan (EAP) should be drawn up covering all types of emergencies specifying the role of each member. It should be practiced periodically.

31. SWIMMING POOL MAINTENANCE: -

a) Before start of the pool activity take inventory of your pool, pump room, safety equipment, gates, pool signs, working telephones and general condition of the facility.

b) Check the tiles in the pool to make sure there are no cracked tiles. Cracked tiles have sharp edges and can cause cut fingers, toes, hands, feet etc. Have tiles replaced as soon as possible. This type of work can be done when the pool is drained and cleaned for opening day.

c) Brush pool bottom and sides to loosen dirt then vacuum pool

d) Remove debris from basket and skimmer system

e) Check and lubricate fittings like o-rings, plugs

f) If necessary, backwash filter

g) If necessary, add algaecide

h) Perform visual inspection of pool water to ensure color, clarity, and visible debris

i) Remove organic debris

j) Use leaf scoop to remove debris on the bottom of your pool

k) Feed the pool with chlorine or other sanitizer to satisfy its requirements either manually or automatically.

l) Ensure the water level is correct for the pump system

m) Adjust pool chemical levels using test kits

n) Add pool shock to ensure pool does not turn green and remove contaminants

o) Adjust pool chemistry pH, alkalinity, calcium hardness o

p) Only adjust pH levels once a week.

q) pH should range between 7.2 – 7.8 depending upon the pool finish. PH levels should be adjusted to increase or decrease until they are in the right levels. To increase pH levels use a pH increaser like sodium carbonate. To decrease pH levels use a pH decreaser like sodium bicarbonate.

r) Test bromine and chlorine levels: Free chlorine levels should range between 1-3 ppm and Free bromine levels should range between 3-5 ppm

s) Adjust Alkalinity levels (range between 80-120 ppm), Stabilizer and Oxidizer levels

t) Calcium Hardness: 180 – 220 ppm

u) Clean water line near tile

MAINTENANCE OF SWIM POOL: There are some routines which need to be carried out to maintenance of swim pool.

a) **Daily Routine:** During the operation of filtration plant have to carefully check the quantity of OZONE treatment. It should be dosage of 01 PPM in the treated water and value in the pool water is maintained between 7.2- 7.8. Daily micro-biological should be done as per specified scale.

b) **Weekly Routines:** Weekly suction sweeping has to be carried out two times in a week.

c) **Quarterly Routine:** - Suction sweeping brush should be changed every 3 month.

   i. Bleaching tank should be cleaned every 3 month

   ii. Pressure filter media should be change every 3 month

d) **Yearly Routine:** The swimming pool filtration plant has to be stopped yearly or during major cleaning / repair / yearly routine should be planned during term break or any decided time for min 10 days.

FIRST AID

Definition: Any help after the accident before arrival of the doctor to reduce the pain of the victim is called **First Aid**. After accident first 15 minutes is called **PLATINUM PERIOD** and first one hour is called **GOLDEN HOUR**.

1. BASICS OF FIRST AID:

1) Save a valuable life
2) Call emergency medical help
3) Avoid any of the Infection

2. AIM OF FIRST AID:

- Preserve life: includes life of casualty, by stander and rescuer
- Protect casualty from further harm
- Prevent injury or illness becoming worse
- Provide reassurance to the Victim

3. RESPONSIBILITIES AS A FIRST AIDER:

- To assess the situation quickly and safely and call for help.
- To identify the injury or nature of illness affecting casualty.
- To give the First Aid or treatment as early as possible in the most serious conditions.

1. First Priority: - A non-breathing person may die within 3- 4 minutes unless resuscitated.

2. Second priority: - A person with heavy bleeding will lose enough blood to die in 15 Min unless his bleeding is stopped or controlled.

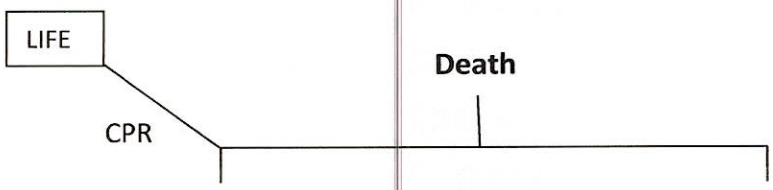
3. Third priority: - Those are getting Fractures and others injury.

4. PRINCIPALS OF FIRST AID (4 A's):

- **Awareness** – First Aider must have awareness about suitable place for providing First Aid/ CPR to the victim and also awareness of use of gear's and equipment.
- **Assessment** - Before starting the first aid always do assessment of the victim about how, when, where and why the injury occurred and plan according the priority for first aid.
- **Action** – Initiate first aid/ CPR as per the priority and seriousness of injury.
- **After care** – Reassure the victim while providing and after the first aid until arrival of the Emergency Medical Service.

5. WHAT IS DEATH?

There are two type of death as follow:



Clinical death	Biological death
a) No breath- Air way block	a) No breath
b) No pulse- Carotid pulse missing	b) No pulse
May be heart stopped	c) Brain is dead

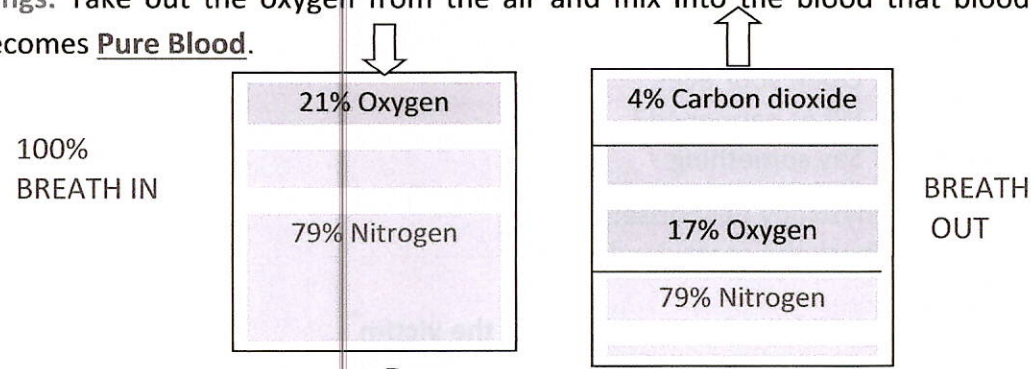
***The Clinical death converted to Biological death within 3 to 6 min unless resuscitated.

6. VITAL ORGANS OF HUMAN BODY AND THEIR FUNCTION.

(a) Airway (b) Lungs (c) Heart (d) Brain

a) Airway (wind pipe): Supply the air to the lungs.

b) Lungs: Take out the oxygen from the air and mix into the blood that blood becomes Pure Blood.



c) Heart: Circulate and continuous pumping out the PURE BLOOD to all parts of body through the Arteries and recollects IMPURE BLOOD from all parts of body through the Veins and send to the Lungs for reoxygenation.

d) Brain: To pass the Instruction to all parts of body and control their function.

7. CARDIO PULMONARY RESUSCITATION (CPR)

- **C** – Cardio (related to heart)
- **P** – Pulmonary (related to Respiratory system)
- **R** – Resuscitation – (Restart the Heart or Respiration)

Cardio Pulmonary Resuscitation is the procedure to be performed on the victim who is not breathing or having no pulse. The first aider must be skilled in performing CPR as this may help in recovering the victim or at least restricting the victim for going from Clinical Death to Biological Death until the professional medical help arrives.

CPR Procedure:-

(a) DR.ABC – This procedure is performed on victim who is clinically dead due to drowning, suffocation, chocking

(b) DR.CAB – This procedure is performed on victim who is clinically dead due to sudden cardiac arrest such as Heart Attack, Mental Shock, Snake Bite, Electric shock, Heat Stroke

CPR Procedure – DR.ABC

(a) **D** – Remove the Victim from Danger Place to Safe Place

(b) **R** – Response, check the response for life. There are two methods to check response

(aa) **Verbal Response (COWS):-** Tap the victim gently and ask some questions.

- Can you hear me?
- Open your eyes
- What happened?
- Say something

(ab) **Physically Response:-**

- Check the carotid pulse

(c) Dot(•) – **If there is no response of the victim**

- Stop for one sec
- Call the Doctor and an Ambulance for help and pass following information
  - ✓ Location- Address
  - ✓ Gender – M/F
  - ✓ Age – 55 yrs
  - ✓ No response come ASAP or immediately and start the CPR

(d) **A –** Check and clean the airway.

(e) **B –** Give 2 emergency rescue breaths within 5 sec

(f) **C –** 30 chest compression continuously (Complete in 20 sec) and check the Carotid Pulse.

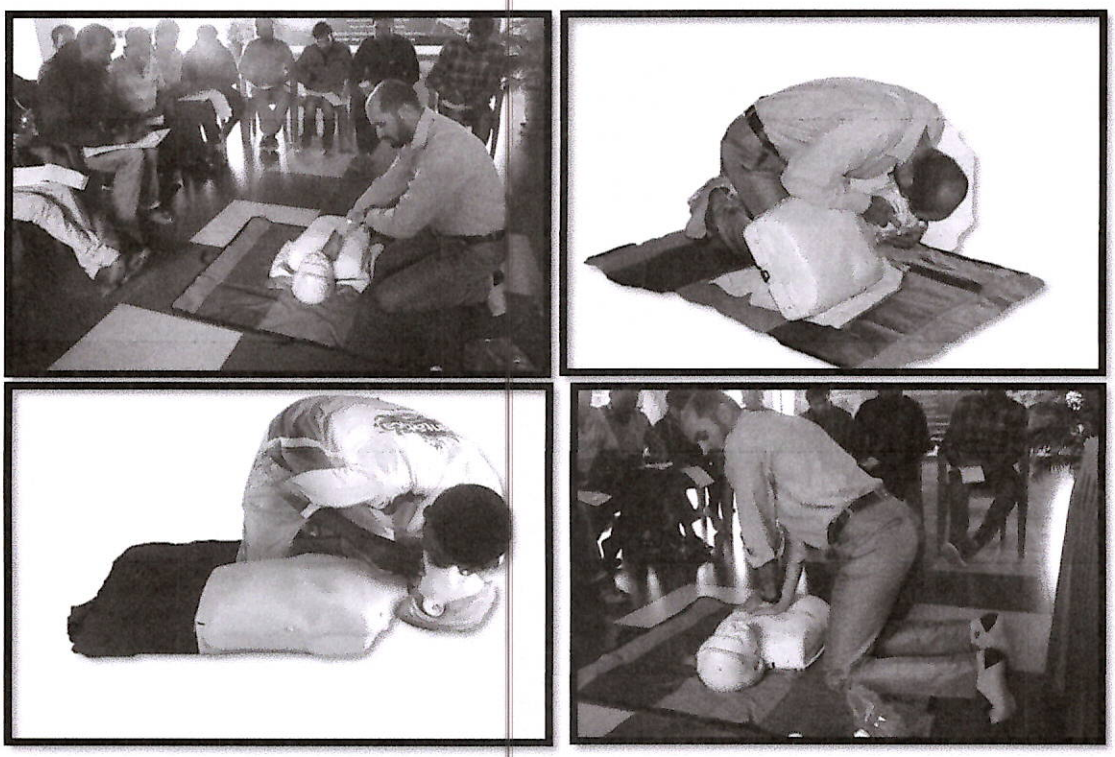
(g) If there is **NO PULSE** then again start the CPR Cycle.

- ✓ 2 breath - 30 Compression
- ✓ 2 breath - 30 Compression
- ✓ 2 breath - 30 Compression

} This cycle should complete in 01 min

(h) Check the pulse, if there is no pulse, again start the CPR cycle till doctor arrives or victim is revived.

(i) If the Victim is resuscitated then put him in recovery position and check his pulse in every one minute interval till the doctor arrives and you hand over the victim to the doctor



CPR SKILL CHART

Sr. No.	Victim Types	Infant	Child	Adult
1.	Age limit	Below 1 yrs	Between1-8yrs	Above 08 yrs.
2.	Check the pulse	Brachial (10 -15 Sec)	Carotid (10 -15 Sec)	Carotid (10 -15 Sec)
3.	Air blown in one breath	50-100 ml (just a puff Covering nose & Mouth)	250 ml.	500 ml.
4.	Chest Compression If no breath and no pulse	30 compression with two finger	30 compression with one hand palm heal	30 compression with two hand palm heal on top of other with fingers interlocked
5.	Compression depth	½ inch	1-1.5 inch	2-2.5 inch

8. RECOVERY POSITION: There are 6 steps for recovery position is as follows:

Step 1: Support the victims head and keep the left arm upward on the left ear.

Step 2: Keep Right hand palm on left ear.

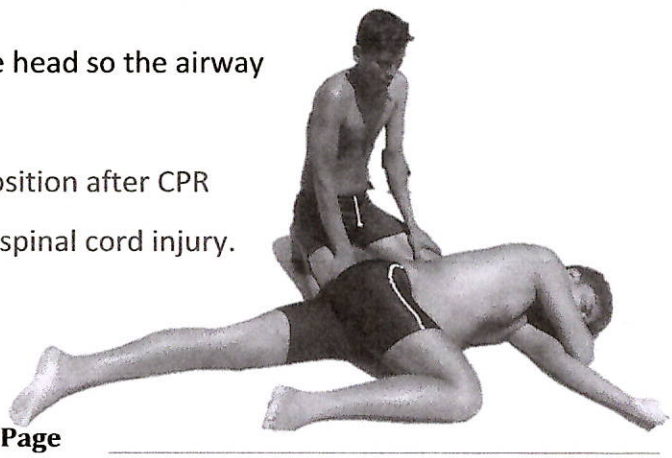
Step 3: Bend the right knee.

Step 4: Tilt the victim to the left side.

Step 5: Gently place the right knee and stomach on the ground with feet apart.

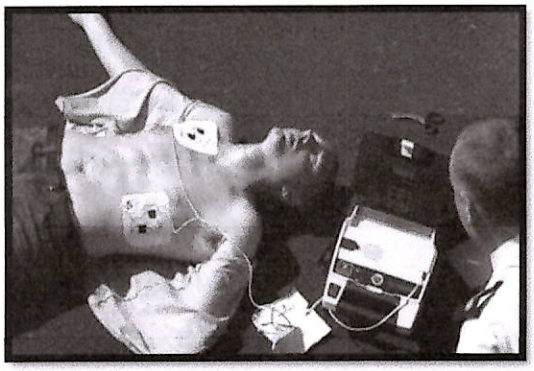
Step 6: Carefully tilt back the head so the airway remain open for easy breath.

Note: Don't put the victim on recovery position after CPR for Heart attack, snake bite, fracture and spinal cord injury.



9. AUTOMATED EXTERNAL DEFIBRILLATOR (AED):

An AED, or automated external defibrillator, is used to **help those experiencing sudden cardiac arrest or clinically dead due to drowning or other reasons**. It's a sophisticated, yet easy-to-use, medical device that can analyze the heart's rhythm and, if necessary, deliver an electrical shock, or defibrillation, to help the heart re-establish an effective rhythm. (source: www.redcross.org)



Steps of AED operation are as follows:

- **Step 1:** Access the Victims Response and Call for EMS
- **Step 2:** Remove Clothes, dry victim's chest and shave off chest hair if any with disposable razor blade
- **Step 3:** Power On the AED.
- **Step 4:** Place one pad on the upper right side of the chest and the other pad on the lower left side of the chest, a few inches below the left armpit
- **Step 5:** Prepare to let the AED analyze the heart's rhythm: Make sure no one is touching the person and Say, "CLEAR!" in a loud, commanding voice
- **Step 6:** If the AED determines SHOCK is needed then; Clear the victim and press the SHOCK button.
- **Step 7:** After the AED delivers the shock, or if no shock is advised, immediately start CPR.

10. HEART ATTACK: In the whole world this is the very common condition which can happen at any time anywhere.

Causes: Normally, this would occur either because of a shortage of blood, insufficient supply of oxygen to the heart, blood supply obstructed by a clot or constricted arteries, any serious accident, suffocation, shock, snakebite and overdose of medicine/ drugs.

Symptoms:

- Severe pain in chest spreading or also in the left arm/ neck.
- Difficulty in breathing
- Profuse sweating
- Irregular heartbeat.
- Palpitation & fibrillations

- Nausea or vomiting
- Pale and clammy skin
- Bluish lips or nails

First Aid for Heart attack:

- Call for Emergency Medical Service
- Make victim seat in slanting position with legs folding and knee bend
- Wipe out all the sweating and keep victim warm
- Ask victim for any perpetual medicines and give it to him
- Loosen the clothing from neck, chest and waist
- Do not give anything to eat or drink
- Discourage victim to visit the toilet
- In case the victim become unconscious

* Check signs of life like speech, movement and breathing.
* If there is no pulse or no breath at the same time start the CPR and handover the victim to doctor or any qualified person.

11. STROKE: A stroke is to the Brain, while an attack is for the Heart and as such requires very similar actions.

Causes:

1. It can be caused by too much blood in the brain which could lead to a blood vessel bursting or too little blood and, therefore, starvation of oxygen.

2. A stroke may also be a consequence to a serious head injury.

How to recognize the stroke victim:

FAST (Face, Arm, Speech test)

F: Facial weakness- Can a person smile? Has his/her mouth or eyes drooped?

A: Arm weakness- Can the person raise both arms?

S: Speech problem – Can the person speak clearly and able to understand what you say?

T: Time to call ambulance

If victim fails any of the above tests, immediately call for the help.

Other symptoms –

- Sudden severe headache
- Nausea and vomiting
- Profuse sweating
- Pressure with the skull area could even cause a clear discharge from the nose/ ear (Cerebral Compression)
- Paralysis
- Behavior resembling that of a drunken person
- Weakness
- Blurred vision or unequal pupils
- Involuntary urination
- Unconsciousness

First Aid:

- Reassure and calm the patient
- Make the victim lie down, with head raised very slightly and to one side.

This would permit saliva to drain out.

- Loosen clothing, particularly around the neck, chest and waist.
- Keep the person warm in a thick sheet.
- Do not give the victim anything to eat or drink.
- In case the victim becomes unconscious, check ABC and place in

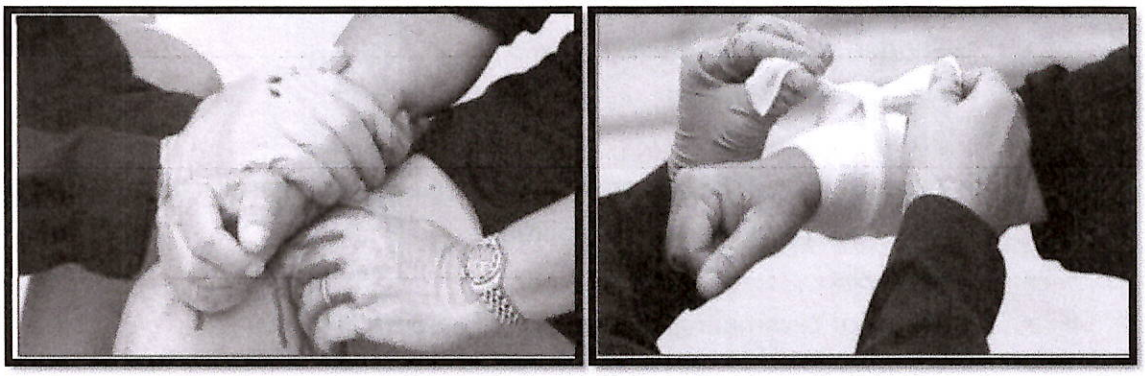
'Recovery Position' or start CPR as applicable/necessary.

Continue this even in the ambulance.

12. BLEEDING: An adult has between five to six liters of blood. Blood provides oxygen to all the vital organs of the body. Out of 6 liters of blood, if half liter blood is lost then there is risk of life. Therefore after breathing, bleeding is the second priority in life saving.

Basic First Aid for bleeding

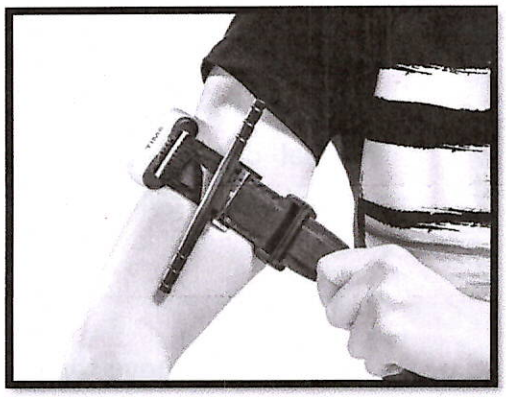
1) **Local pressure**: To stop bleeding the first and basic step is to apply direct pressure on the bleeding area with a clean sterile bandage for minimum 10 minutes. If the bleeding persists then keep the first bandage as it is and tie second bandage over it with medium pressure.



2) **External Pressure Bandage:** When the direct pressure is not effective to control bleeding, then don't remove bandage used for Direct Pressure and apply External Pressure Bandage medium tight over the first bandage.

3) **Arterial pressure**: In our body there are few arterial pressure points which when pressed will reduce the blood flow further and hence will gradually reduce bleeding. It should be supplementary and should be applied for not more than 05 minutes.
   a) Both wrist – 2
   b) Under Armpit – 2
   c) Shoulder – 2
   d) Neck – 2
   e) Behind knee –2
   f) Ankles – 2

4) **Tourniquet:** When there is heavy bleeding after an injury to a Limb or after an amputation, the first action to be taken by a First Aider is to stop bleeding immediately within Platinum Period. To stop the bleeding, Tourniquet bandage or strap is used.



13. TYPES OF WOUND:

Abrasion: Skin layer has been scraped off due to falling on rough surface, claw of animals and machinery.

Avulsion: Slicing of skin with sharp blade, knife, metal or broken glass.

Laceration: Jagged edge, crushed with tissue loss due to barbed wire force, speed collision on rough surface.

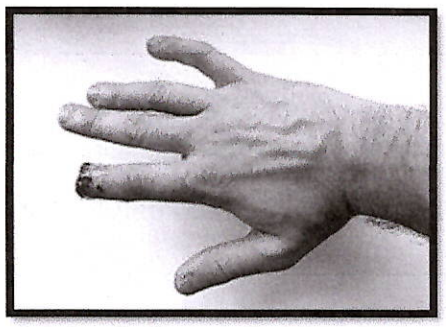
Puncture wounds or impaled object: Wounds are perforated deep affecting internal organs due to standing on nail, screw, knife or bullet etc.

First Aid:

(a) Don't remove the impaled object. As it has damaged the blood vessel and nerves while entering the body and if tried removing may damage the non-affected area.

(b) If the impaled object is round then put doughnut bandage around the object and if the object is flat then support it with soft cotton guage from both side and tie it with bandage in figure of eight pattern.

Amputation: If in an accident or other case if the body part like finger, toe etc. separated from body. First stop the bleeding and then don't touch the amputed part with bare hands, use gloves/ sterile cloth/ polythene bag. Collect the part put in to polythene bag and if you have Ice cubes or ice water put it in another polythene bag and the put first bag along with the part in the ice bag. This may be able to preserve the part or storage before doctor arrives.



14. FIRST AID FOR ALL WOUNDS :

i) Barrier

a. Put your safety first and ensure that you are not in danger.

b. If available, wear protective hand gloves.

c. If you do not have gloves, you should avoid direct contact with casualty's blood and use an improvised barrier.

d. Create a barrier between yourself and the potential source of infection. This can be done by using gloves, or anything that may be available e.g. plastic bags.

ii) Locate and Examine

a. Reassure the casualty.
b. Assess the wound and source of the loss of blood.
c. If necessary remove clothing from the casualty to confirm the source of blood loss.
d. Check for foreign objects in the wound e.g. glass. If present it must stay in place and not to be removed (see Doughnut Bandage)

iii) External Direct Pressure

a. Do not waste precious seconds by attempting to open and apply dressings at this stage.
b. With your gloved hand apply external direct pressure to the wound.
c. If a foreign object is present, you will have to apply pressure around the object.
d. If appropriate, allow the casualty to apply external direct pressure with their free hands.
e. If you have not done so already, ensure your casualty is sitting or lying down.

iv) Elevation

a. Whenever possible, the injured body part should be raised, elevation particularly with regard to limbs should be above the heart.
b. If dealing with the legs, the casualty should laid down with both legs elevated.
c. The elevated limb may require support.

v) Dressing

a. Select a suitable sterile dressing from your first aid box.
b. If the dressing is applied to a limb, check the circulation to the hand or foot to ensure the dressing has not been tied too tightly.
c. Apply a dressing directly to the wound and bandage it firmly in place.
d. Whilst keeping the injury elevated watch for any signs of blood seeping through the dressing.

e. If blood seeps through the dressing apply a 2nd dressing on top of the first dressing. If blood seeps through the second dressing, remove both and apply a new dressing.

f. If there is a foreign object in the wound leave it in place and build the dressing around the object. Do not apply pressure directly.

15. FRACTURE & DISLOCATION:

Symptoms: a) Acute pain

b) Swelling

c) Discoloration of skin

d) Dysfunction of body part

e) Immobilized body part

First Aid:

1. To stop the movement with supports and restriction of moment with slings like Arm Sling, Collar and cuff sling and Triangular Sling.
2. Barrier, locate and examine, external direct pressure elevation, Dressing, Blood and Body Fluid cleanup.

16. CHOCKING: While eating or drinking if any food particle or liquid blocks the wind pipe or trachea then the person will not be able to breathe, speak, laugh or cry and hence is very serious condition unless given first aid immediately.

Symptoms

a) Cannot breath
b) Cannot laugh
c) Cannot cry
d) Cannot speak

- Dry Drowning
- fish thorn
- Chicken bone
- Rice
- Marbles
- Coins
- Chewing gum
- Water

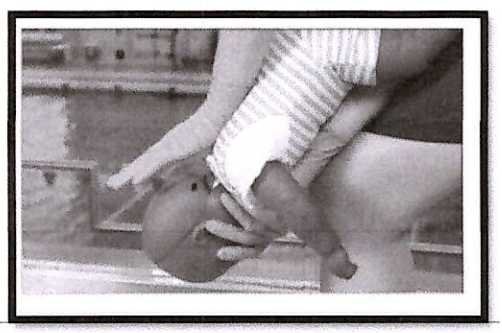
Back Thrust

Abdominal Thrust (Heimlich Maneuver)

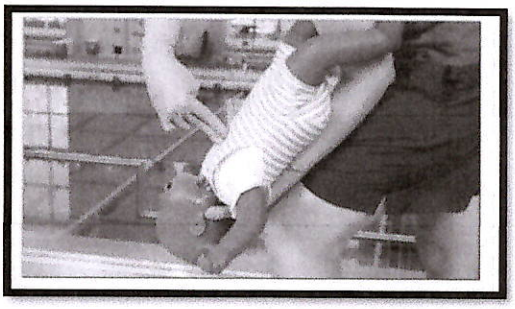
First Aid:

a) Bend Forward, look forward, open the mouth and give five back blows with heel of your hand and push forward.
b) If this does not work, give abdominal thrusts also known as Heimlich Maneuver. Stand behind, put both arm around the waist and grab the fist and place it between end of sternum and navel, thumb side in. Push the fist inward and upward at the same time and perform this five times.
c) If this does not expel the blockage keep trying alternating five back thrusts and five abdominals thrusts.
d) Don't perform abdominal thrust on pregnant ladies and infants.
e) If the patient falls unconscious, check for response and start CPR.

If it is Child: Give five back thrusts with fore finger and palm should be fixed on one place.



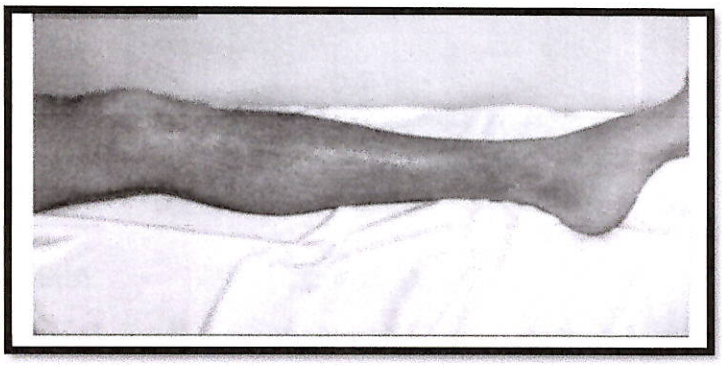
Using one hand and give five abdominal thrusts inward and upward with two fingers.
If the child falls unconscious start CPR and call an Ambulance.



17. BURNS:

Degree of burns:

1st Degree – when the skin is reddened



2nd Degree – when there are blisters on the skin

3rd degree – when there is destruction of deeper tissues.

First Aid: -

- Stop the burning by removing the victim from the source of the burn.
- Immediately flood the injured part with cold water for about 10 minutes to stop the burning and relieving the pain.
- Gently remove any jewelry, watches or constricting clothing from injured area.
- Cover the area with a sterile dressing to give a temporary covering.
- Make comfort and reassure the victim.

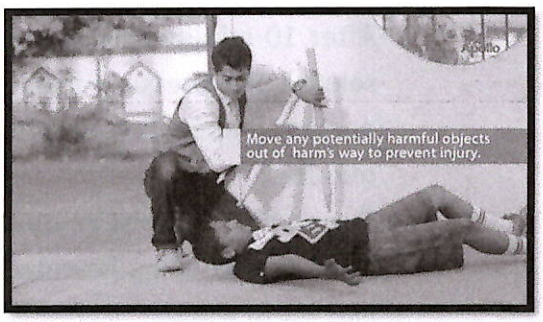
18. SEIZERS OR FITS: Seizers or fits is a simultaneous involuntary contraction of muscles of the body caused by a disturbance in the function of brain. It is a sudden loss of consciousness.

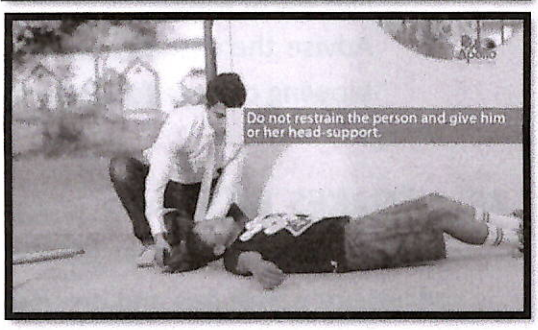
Symptoms:

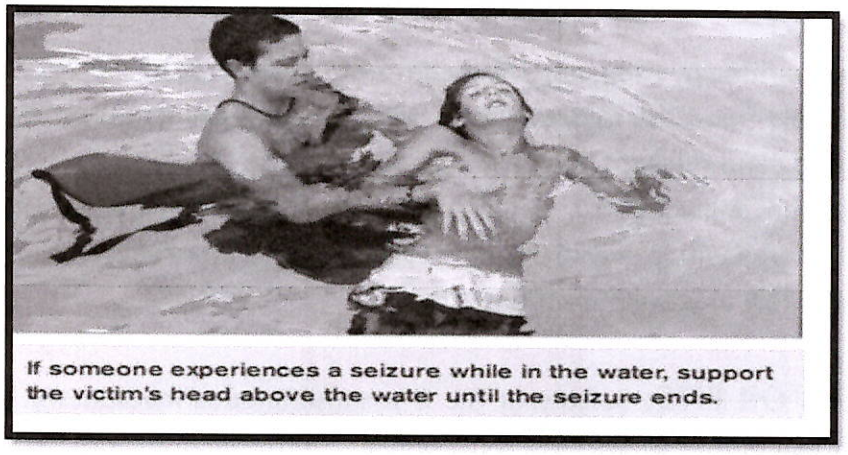
- Muscles spasm
- Body stiffening
- Breathing becomes noisy
- Drooling
- Convulsions
- Loss of bowl and urine control
- Salivation
- He may bite his tongue

First Aid:-

- Make patient lie down on the floor.
- Remove any dangerous objects or heavy furniture aside and make some space for patient. (glass, sharp equipment)
- Try to control victims movements but not stop, stopping movements may result in broken bone.
- Do not give victim anything to eat, drink and smell.
- Do not put anything in the victim mouth. It may result in to loss of teeth.
- Loosen the clothing around the neck
- Prevent biting of tongue if possible by inserting soft material between the clenched teeth.







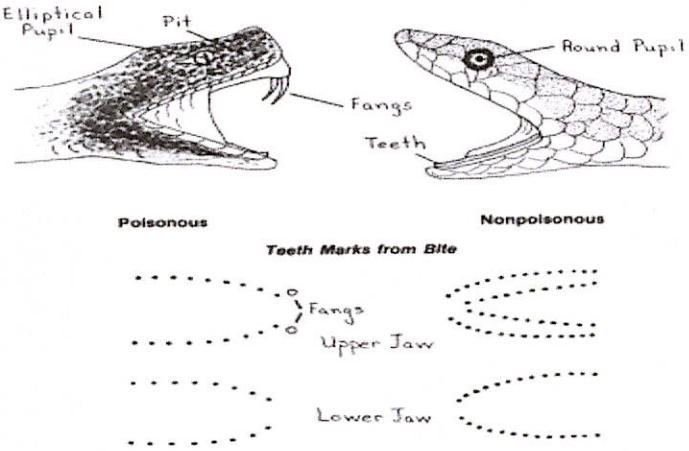
If someone experiences a seizure while in the water, support the victim's head above the water until the seizure ends.

19. NOSE BLEEDING: Nose Bleeding is loss of blood from the tissues forming inner lining of the nose and can cause due to cold/ dry air, sinusitis, allergies, dehydration, blood-thinning medications, and trauma.

- Make the casualty to sit down with head held well forward.
- Do not let head tip back.
- Ask the casualty to pinch the nose for 10 minutes breathing through the mouth.
- After 10 minutes tell the casualty to release the pressure if bleeding still persists reapply pressure for other 10 minutes.
- If nose bleed persist beyond 30 minutes take the victim to hospital.
- Once the bleeding is under control, gently clean around nose and mouth with like warm water.
- Advise the casualty to rest quietly for a few hours. Avoid exertion particularly blowing of nose for disturb any clot.

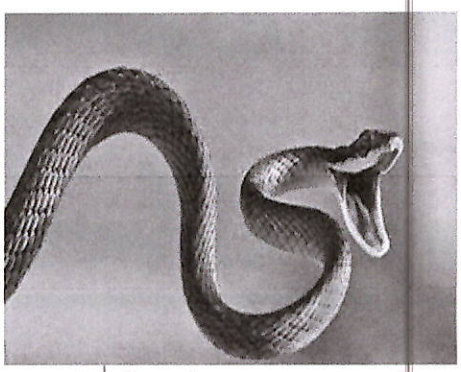
20. SNAKES BITS: Snake is a good friend of farmer/ human, snake doesn't have memory/ cannot listen. In India we have 206 species of snakes, out of which only 52 species are poisonous and divided in or varieties:-

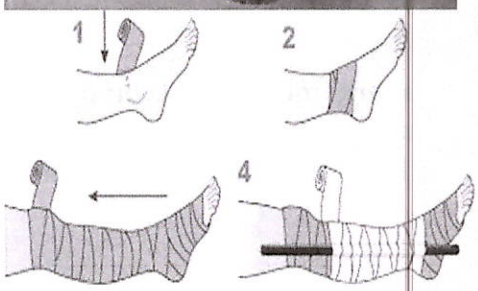
1) Cobra 2) Kraits 3) Viper
4) Coral Snake 5) Sea Snake

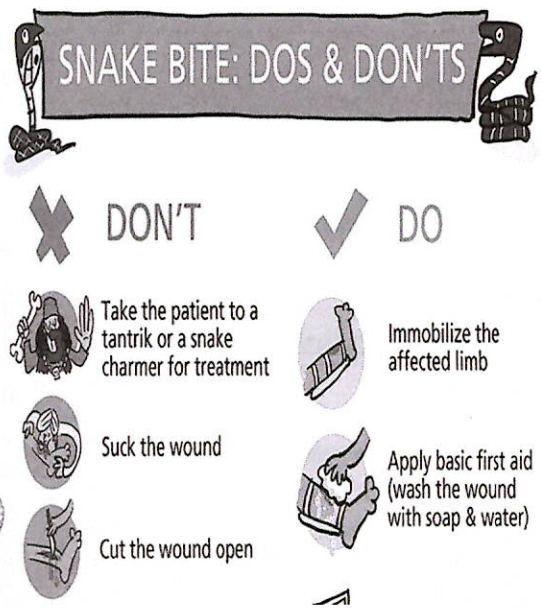


Symptoms:
1) Redness, swelling and pain at bite place.
2) Salivation
3) Dizziness
4) Blur vision
5) Difficulty of breathing
6) Shock

First Aid:
1) Action should be taken within 6-8 mins.
2) Assure the victim
3) Wash the bitten place with clean water and pat it dry
4) Apply bandage for local and arterial pressure
5) Call the nearest hospital and ask whether they have **"ANTI VENOM SERUM"** Injection.







21. FAINTING:

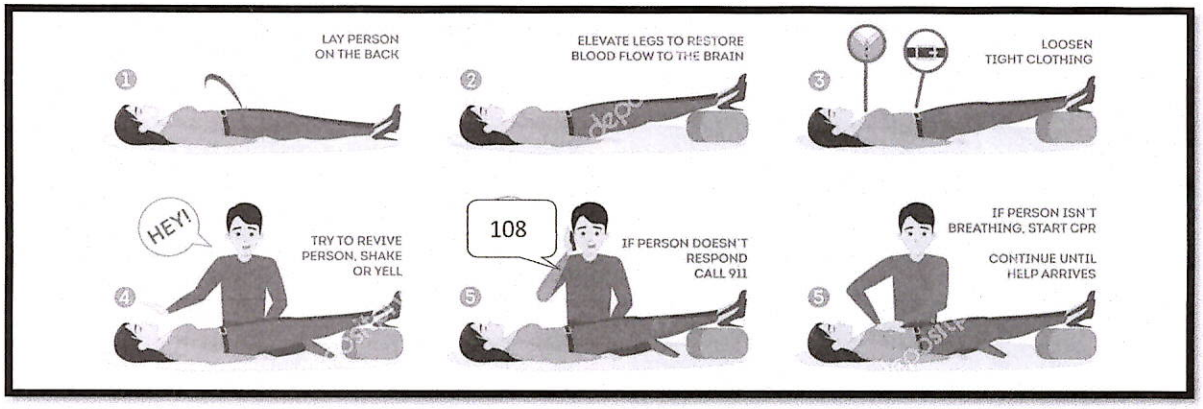
Fainting is a brief loss of consciousness caused by a temporary reduction of blood flow to the brain. Blood pools in the lower part of the body reducing the amount available to the brain. It can be a reaction to pain, fright, hunger, exhaustion, emotional upset, physical inactivity and excess heat.

Signs and Symptoms:

a) Giddiness occurs with sweating
b) Face becomes pale
c) Weak or slow pulse
d) Skin becomes cold and sticky

First Aid:

- Move casualty to shady place.
- Make sure there is penalty of fresh air. Ask the on- lookers disburse.
- Lay down the victim on the ground.
- Loosen the clothing at waist, chest and neck.
- Raise and support his legs to improve the blood flow to the brain.
- If the casualty is in sitting position and starts faint again, place his head between his knees and tell him to take deep breaths.
- If the condition do not improves, take the patient to the doctor.



22. Transportation of Victim:

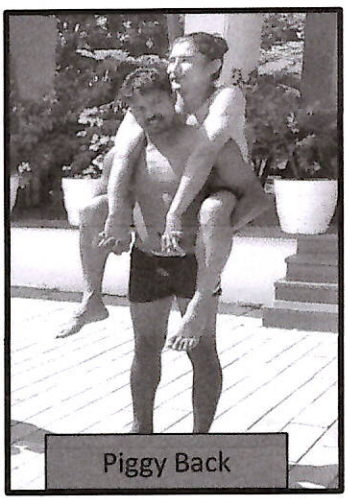
a) During the journey to the hospital, patient must be accompanied with a qualified medical professional or a Primary First Responder, monitoring vital signs and taking any action required. The ambulance driver shall also be a qualified First Responder.

b) Transportation of victim with spinal injury:
   - Typically paramedics will immobilize the patient on a backboard or Spine board and transport him to the ambulance.

c) **Lifts and Carries:**
   i) Do not lift/ carry the victim before checking for injuries
   ii) Move a victim only if there is immediate danger
   iii) Don't move a victim if moving the person will make injuries worse
   iv) If it is necessary to move a victim, your speed will depend on the reason for the move
   v) Use good body mechanics and lifting techniques

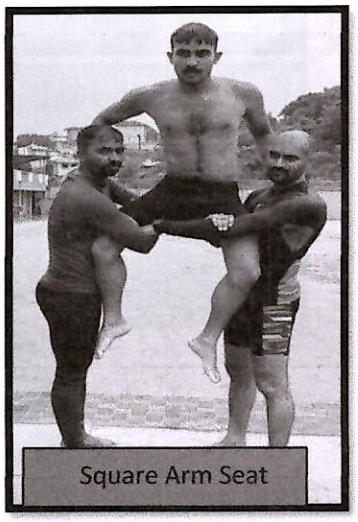

Firemen Lift


Baby Carry


Piggy Back


Two Hand Seat


Cross Arm Seat


Square Arm Seat

d) **Immobilisation of Spinal injury victim:**

- **Equipments used** – Spine board, cervical collar, spider straps, towel rolls with tape and blankets to pack void spaces
- **First Responder's action**:

i) First responder should not move the victim with spinal injury unless he/ she is trained for it.

ii) Wait till the professional help arrives

➢ **Procedure for spinal management by professional's**:

i) First assess the victim for injuries

ii) Support neck with cervical collar

iii) First FR will hold victim's head

iv) 2nd and 3rd FR's will hold the victim from side as shown in figure 2

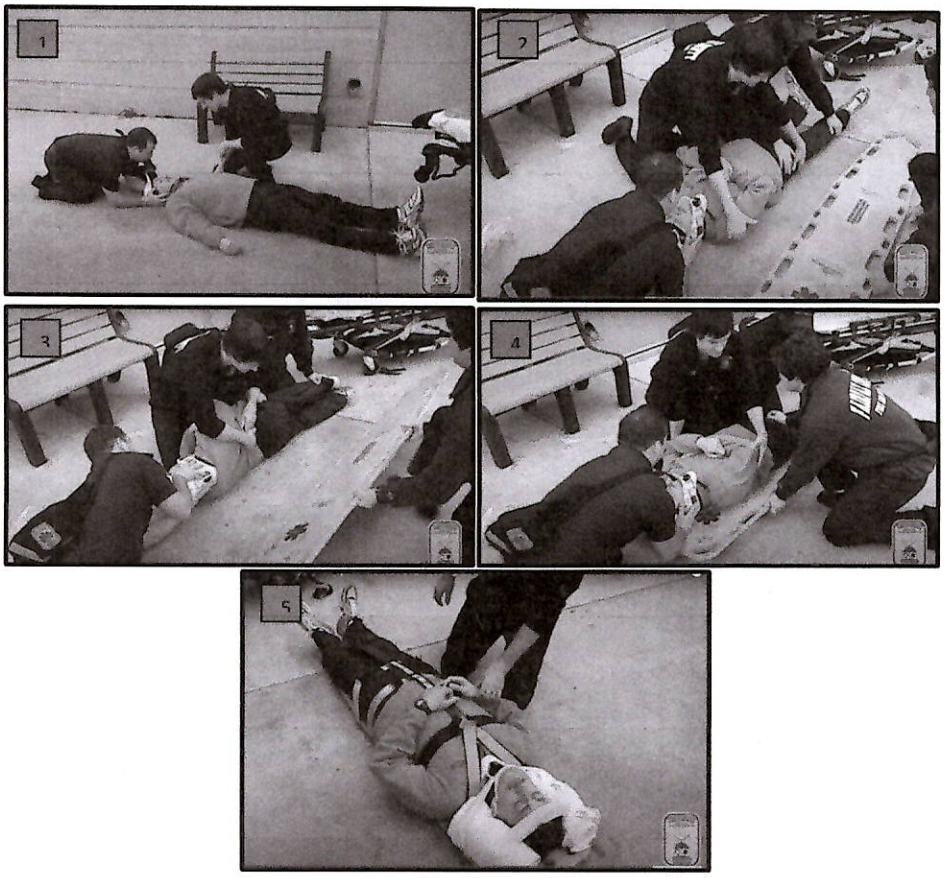
v) 4th FR will ready the Spine Board

vi) Then the victim will be turn on one side towards FRs position and maintain the back posture straight along with head support

vii) Spine board is placed under the victim and the victim is rolled back on it

viii) The head is supported with head-supporters or towels and strapped with tape

ix) Spider straps are put on the victim supporting his shoulder, chest, hip, thigh and lower legs.



23. FIRST AID RECORD/ REPORT

The accurate recording of injury/illness is also of great assistance to any medical personnel who take over your casualty's treatment, such as doctor, paramedic or ambulance officer. The format that is used to report injury and illness varies from workplace to workplace, and from State to State due to different policy requirements or legislation.

The information which should be contained in an injury/illness report is:

- The date and time of incident
- Brief personal details of patient (name, address, date of birth)
- History of illness/injury
- Observations (signs, symptoms and vital signs)
- The first aider's assessment of the injury/illness
- First Aid given: Time start and Time end.
- Patient Handed over to Doctor or sent home
- Name and Signature of first aider
- The date of report
- The first aider keeps a copy as a record which is to be kept secure.

-X-X-X-X-X-X-X-