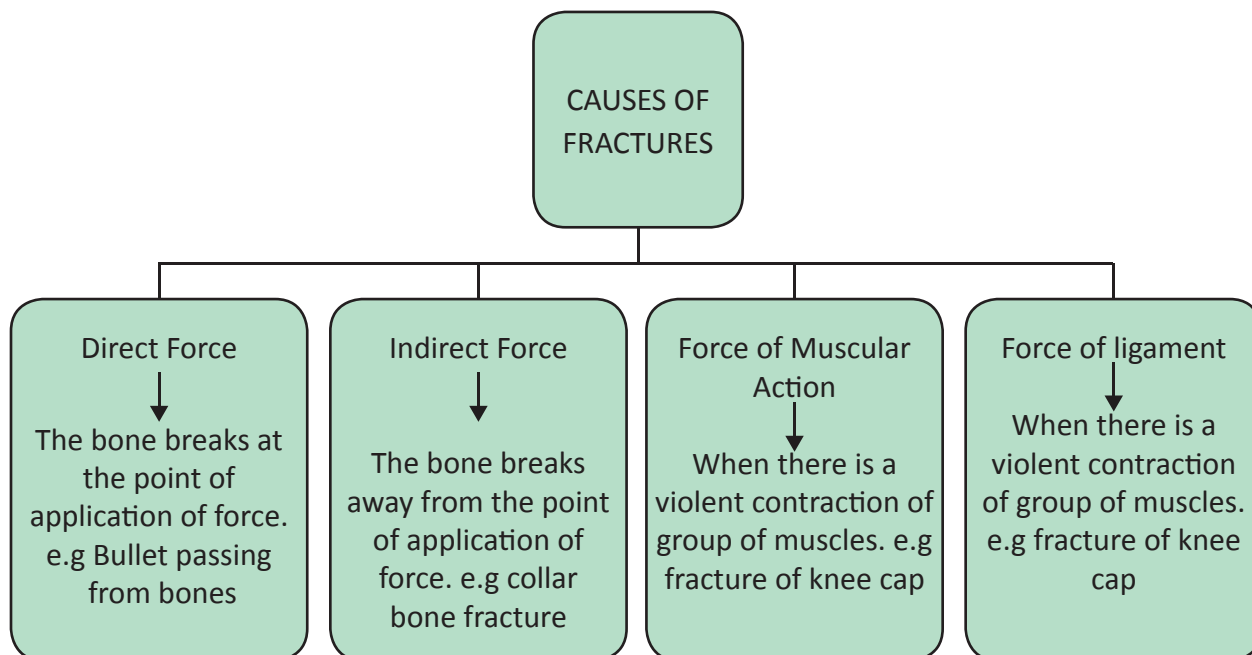


FIRST-AID IN MEDICAL AND SURGICAL EMERGENCIES

4.1 FRACTURES

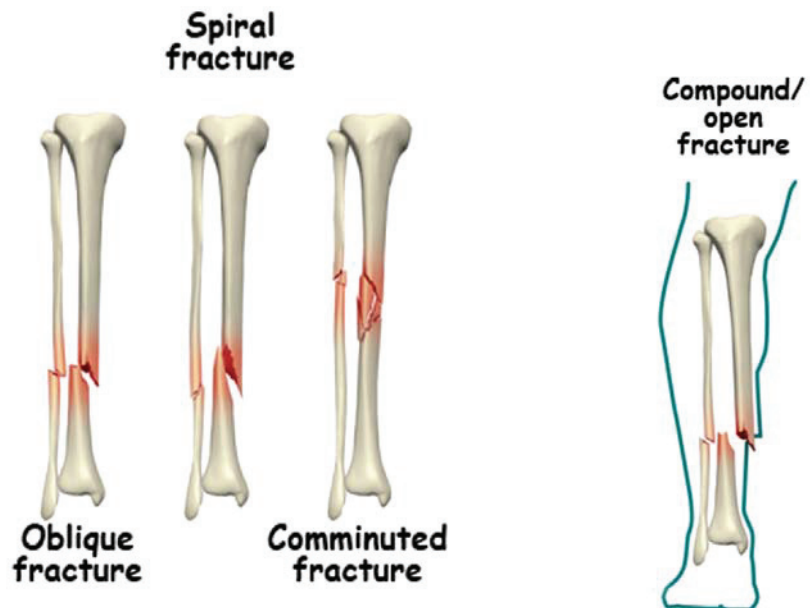
A fracture is a partial or complete breakage of a bone.

4.1.1 CAUSES



4.1.2 TYPES OF FRACTURE

1. Simple (close) fracture - the skin surface is intact around the broken bone.



2. Compound (open) fracture – the broken bone comes out of the skin which leads to extensive blood loss and infection.
3. Complicated (closed/open) fracture – when there is associated injury like injury to nerve/ blood vessel.

4.1.3 SIGNS OF FRACTURE :

1. Pain/tenderness at the site of injury, which increases by movement.
2. Swelling of the area and discoloration.
3. Deformity (change in shape) of broken limb.
4. Loss of power in an affected limb.
5. Crepitus (grating) :- where one end of the broken bone move against the other, crackling sound is heard called as crepitus.

4.1.4 AIM OF THE ASSISTANCE IS:-

1. To prevent further damage.
2. To reduce pain.
3. To make patient comfortable.
4. To get medical help at the earliest.

IMMOBILIZING FRACTURE

1. Immobilizing the injured part by using the body as a splint where possible like tying an injured leg to the uninjured leg.
2. Give nothing by mouth.
3. Do not attempt to straighten a limb before immobilization.
4. If a limb is injured, immobilize the joints above and below the fracture.
5. Do not tie too tightly and watch for blood circulation in toes and fingers. If they become blue loosen the bandage slightly.

IF THE BONE IS PROTRUDING FROM THE WOUND (open fracture) :-

1. Control bleeding by applying pressure along the side of bone.
2. Gently place a clean piece of cloth over the bone coming out of the skin.
3. Raise the injured part if possible and immobilize it.
4. Shift the casualty to hospital at the earliest.

4.1.5 SOME COMMON FRACTURES & THEIR MANAGEMENT

1. Leg & foot fractures

Legs are often fractured in accidents and as large bones are involved, there can be extensive internal bleeding.

a. When one leg is injured :-

- Cover any wound with clean cloth/dressing.
- Use the unhurt leg as a splint.
- Put pads between thighs, knees & ankles & move the uninjured leg toward the injured leg.
- Tie feet, knees & ankles together.
- Get to hospital on a stretcher.

Do not push back any protruding bone ends.



b. When both legs are injured :-

- Use splints, if available to place between legs.
- Put pads between thighs, knees and ankles.
- Never push the limbs toward the body.
- Put splint in position & tie firmly.
- If splint not available, Bandage the legs together, putting reef knots on the least injured side.
- Support the arm of the injured side with the help of casualty.

2. Collarbone Fractures :

Collarbone is normally broken where the person falls on the tip of the shoulder or on the palm of the outstretched hand. Management

- Place a pad in the arm pit.
- Leaving the forearm free, bandage the upper arm to the side of the chest with a broad bandage.
- Support the upper limb with the sling.
- Feel the pulse to make sure that circulation in the limb is free.
- Shift to the hospital

3. Fractures of the ribs

Ribs are broken by (direct force, indirect force)

Signs of ribs fractures

- Casualty complains of pain in the chest, which is worse on coughing/ deep breathing.
- If a bone has pierced a lung, he may cough up frothy blood.
- Support the arm on injured side in an arm sling.
- If open fracture close wound.

Cover Immediately To Prevent Air Entering The Lungs

- Loosen tight clothing.
- Record pulse rate.
- Reassure the casualty.



4.1.6 SPLINTING THE SUSPECTED FRACTURE

Any device used to immobilize (prevent movement of) a fracture or dislocation is a splint. A splint can be soft or rigid, commercially manufactured or improvised from virtually any object that can provide stability.

Splints are used to support and immobilize suspected fractures, dislocations, or severe sprains; to help control bleeding; to reduce swelling; to help control pain; and to prevent further damage to tissues from the movement of bone ends. Any victim with suspected fracture, dislocation, or severe sprain should be splinted before being moved.

Rules for Splinting:

Regardless of where you apply the splint, follow these general rules:

- Do not splint as it will cause more pain to the victim.
- Both before and after you apply the splint; assess the pulse and sensation below the injury. You should evaluate these signs every 15 minutes after applying the splint to make sure the splint is not impairing circulation.
- Immobilize the joints both above and below the injury.
- Splint an injury in the position you found it. If there is no distal pulse or movement, you may attempt to return the bone to its normal alignment by placing one hand above the injury and another below. Then pull with gentle traction while moving the injury back toward the correct anatomical position.
- Remove or cut away all clothing around the injury site with a pair of bandage scissors so that you do not accidentally move the fractured bone ends and complicate the injury. Remove all jewelry around the fracture site.
- Cover all wounds, including open fractures, with sterile dressing before applying a splint then gently bandage. Avoid excessive pressure on the wound.
- If there is a severe deformity or the distal extremity is cyanotic or lacks pulses, align the injured limb gentle traction before splinting, following the guidelines above.

- Never intentionally replace protruding bone ends.
- Pad the splint to prevent pressure and discomfort to the victim.
- Apply the splint before trying to move the victim.
- When in doubt, splint the injury.
- If the victim shows signs of shock, align the victim in the normal anatomical position and arrange for immediate transport without taking the time to apply a splint.

Types of Splints:

There are four general types of splints:

Rigid Splints:

Rigid splints are commercially manufactured splints made of wood, aluminum, wire, plastic, cardboard, or compressed wood fibers. Some are designed in specific shapes for arms and legs and are equipped with Velcro closure; others are pliable enough to be molded to fit any appendage. One of the most popular commercial splints the SAM splints, a lightweight splint made of pliable aluminum sandwiched between layers of foam; it can be molded to fit any body part. Some commercial splints come with washable pads. But others must be padded before being applied. The splint must be long enough to extend both above and below the fracture.

Traction Splints:

Traction splints gently pull in the direction opposite the injury, alleviating pain, reducing blood loss, and minimizing further injury. Traction splints are not intended to reduce the fracture, but simply to immobilize the bone ends and prevent further injury. A traction splint should be used only for a broken thigh and should be applied only by EMTs or those who have had special training in applying traction splints.



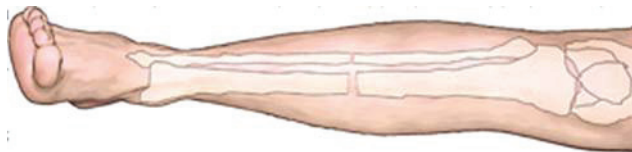
Pneumatic (Air) Splints:



Air splints are soft and pliable before being inflated but rigid once they are applied and filled with air. A similar type of splint is the vacuum splint, which works on the principle of a vacuum. Air splints are used mainly on the forearm and lower leg. Air and vacuum splints cannot be sized, may impair circulation, may interfere with the ability to assess pulses, and may lose pressure with temperature and altitude changes.

Improvised Splints:

You may have access to a commercial splint, but it is much more likely that you will need to improvise at the scene.



A splint can be improvised from a cardboard box, cane, ironing board, rolled – up magazine, umbrella, broom handle, catcher’s shin guard, or any other similar object.

You can also use a self-splint (also called an anatomical splint) by trying or taping an injured part to an adjacent uninjured part; for example, splint a finger to a finger, a toe to toe, a leg to the other leg, or an arm to the chest. An effective improvised splint must be.

- Light in weight, but firm and rigid.
- Long enough to extend past the joints and prevent movement on either side of the fractures.
- As wide as the thickest part of the fractured limb.
- Padded well so the inner surfaces are not in contact with the skin.

An ordinary bed pillow can be an effective improvised splint when wrapped around the area and secured with several cravats.

Hazards of improper Splinting

Improper splinting can:

- Compress the nerves, tissues, and blood vessels under the splint, aggravating the existing injury and causing new injury.



- Delay the transport of a victim who has a life-threatening injury.
- Reduce distal circulation, threatening the extremity.
- Aggravate the bone or joint injury by allowing movement of the bone fragments or bone ends or by forcing bone ends beneath the skin surface.
- Cause or aggravate damage to the tissues, nerves blood vessels, or muscles as a result of excessive bone or joint movement.

Special Consideration in Splinting

There are certain special techniques to remember when splinting long bones or joints or when using a traction splint.

Splinting a Long Bone

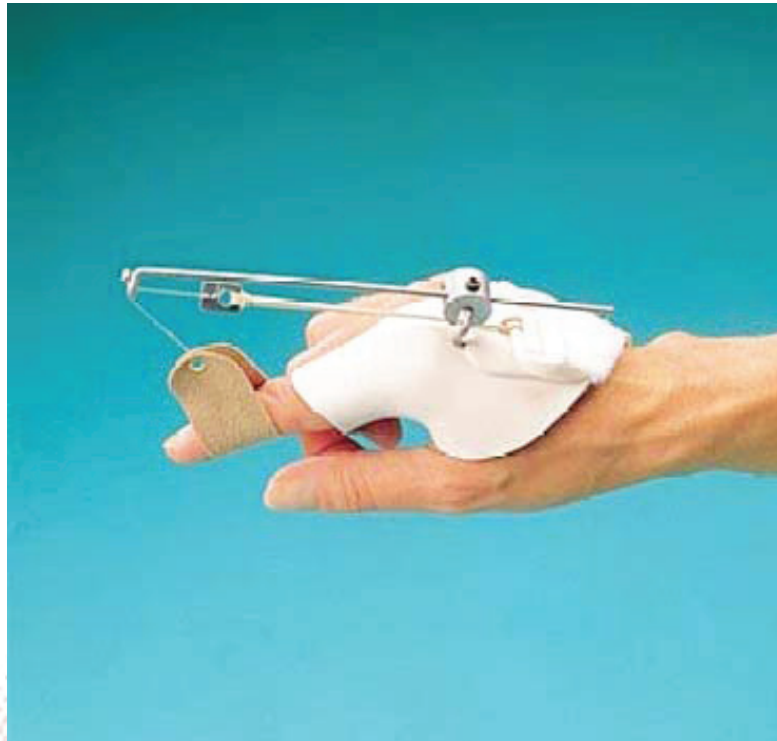
1. Gently grasp the limb and apply gentle, steady pressure to stabilize the bone.
2. Assess the pulse and sensory function below the injury site. Look for Paresthesia (a pricking or tingling sensation that indicates loss of circulation) or paralysis. If the injury involves an upper extremity, nerve function is intact if the victim can make a fist, undo the fist, spread the fingers, and make a hitchhiking sign with the thumb. If the injury involves a lower extremity, nerve function is intact if the victim can tighten the kneecap and move the foot up and down as if pumping an automobile accelerator.
3. If the limb is severely deformed, is cyanotic, or lacks distal pulses, align it by providing steady, gentle pressure along with traction, if pain or crepitus increases, stop.
4. Measure the splint to make sure it is the right size. The splint should be long enough to immobilize the entire bone plus the joints on both sides, if you are immobilizing the leg, ideally, the outside splint should be long enough to reach from the victim's armpit to below the heel; the inner splint should be long enough to reach from the groin to below the heel.
5. Apply the splint, immobilizing the bone and the joint both above and below the injury.
6. Secure the entire injured extremity; you can use the straps or Velcro closures that come with commercial splints, or wrap roller bandages around improvised splints and secure them with cravats.

7. Immobilize the hand or foot in the normal position of function. Make sure you can still see and feel the hand or foot so you can assess pulses and sensation.

Splinting a Joint

Splint a joint as injury follows:

1. Stabilize the joint manually; one first aider should apply firm but gentle stabilization while a second one readies the splint.
2. Assess the pulse and sensory function below the injury site; check for paresthesia or paralysis.
3. If the distal extremity is cyanotic (bluish) or lacks pulses, align the joint with gentle traction. If pain or crepitus increases, stop.
4. Immobilize the site of the injury with a splint.
5. Immobilize the bones both above and below the injured joint to help prevent accidental movement of the joint.
6. After applying the splint, reassess pulse and sensation; every few minutes.



4.2 BURNS AND SCALDS

BURNS result from dry heat, extreme cold, corrosive substances, friction or radiation including sun's rays. SCALDS are caused by wet heat from hot liquids and vapors.

Burns and Scalds may be associated with conditions that pose a greater threat to life or there may be other serious injuries caused.

4.2.1 FIRST-AID PRIORITIES

1. Establish your own safety before attempting to treat the patient.
2. See that airway is clear.
3. Stop the burning, by rapid cooling, to prevent further tissue damage
4. Cover the injury to protect it from infection.
5. Check for other injuries.

4.2.2 THE SKIN

The skin is body's largest organ, covering the entire surface of our body. The skin is made of three layers of tissues, the outer epidermis and the inner dermis and lie on a layer of subcutaneous fat.

EPIDERMIS: Fatty substance that makes the skin water proof.

DERMIS : Blood vessels, nerves, muscles, sebaceous(oil)glands, sweat glands and hair roots(follicles).The sensory nerve within the dermis ensure that the body's surface area is sensitive to heat, cold, pain and the slightest touch.

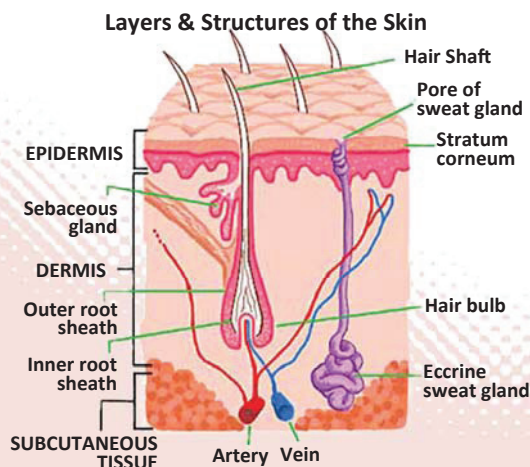


Diagram of the skin layer

4.2.3 ASSESSING BURNS

It is important to consider the size and depth of burn while treating.

The size of burn will tell you whether shock is likely to develop because of excessive loss of tissue fluid (serum). The deeper the burn, the higher the risk. (explained later).

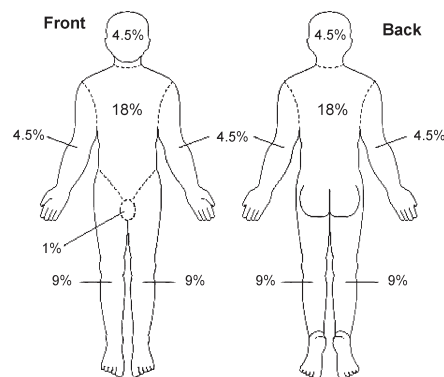
Once the cause is established you can decide on treatment.

HOW BURNS ARE CAUSED?

Type of burn	Causes
1. Dry Burn	Flames, contact with hot objects e.g. Cigarettes, Friction e.g. rope burns.
2. Scald	Steam, hot liquids like tea, coffee.
3. Electrical burn	Low voltage current (household appliances) High voltage current (main overhead cables) Lightning strikes.
4. Cold injury	Frostbite.
5. Chemical burn	Industrial chemicals, domestic chemicals like caustic Soda, bleach, paint stripper etc.
6. Radiation Burn	Sun burn, exposure to radioactive source like X-ray

1. EXTENT OF BURN:

Burns are classified on the basis of area by Rule of 9.



(Diagram giving the percentage of burns)

Any burn of over 30% should be hospitalized as priority.

Rule of nines for Establishing Extent of Body Surface Burned

Abatinuc Surface	% of total body surface
Head and neck	9%
Anterior trunk	18%
Posterior trunk	18%
Arms, including hands	9% each
Legs, including feet	18% each
Genitalia	1%

Figure 1: Diagrams of human body surface areas.

Diagram A: Total body surface area distribution

- Head and neck: 9%
- Trunk: Anterior 18%, Posterior 18%
- Arm: 9% (each)
- Genitalia and perineum: 1%
- Leg: 18% (each)

Diagram B: Relative percentage of body surface areas affected by growth

	0 yr	1 yr	5 yr	10 yr	15 yr
a — 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b — 1/2 of 1 thigh	2 1/2	3 1/4	4	4 1/4	4 1/2
c — 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

- ### Superficial burns (first-degree and superficial second-degree burns)

First-degree burns

- Damage above basal layer of epidermis

- Dry, red, painful ("sunburn")

Second-degree burns

- Damage into dermis

- Skin by re-epithelialization from skin adnexa

- The deeper the second-degree burn, the slower the healing (fewer adnexa for re-epithelialization)

- Moist, red, blanching, blisters, extremely painful

Superficial burns heal by re-epithelialization and usually do not scar if healed within 2 weeks

- Deep burns (deep second-degree to fourth-degree burns)

Deep second-degree burns (deep partial-thickness)

- Damage to deeper dermis

- Less moist, less blanching, less pain

- Heal by scar deposition, contraction and limited re-epithelialization

Third-degree burns (full-thickness)

- Entire thickness of skin destroyed (into fat)

- Any color (white, black, red, brown), dry, less painful (dermal plexus of nerves destroyed)

- Heal by contraction and scar deposition (no epithelium left in middle of wound)

Fourth-degree burns

- Burn into muscle, tendon, bone

- Need specialized care (grafts will not work)

Deep burns usually need skin grafts to optimize results and lead to hypertrophic (raised) scars if not grafted age

- Mortality for any given burn size increases with age

- Children/young adults can survive massive burns

- Children require more fluid per TBSA burns

- Elderly may die from small (<15% TBSA) burns

Smoke inhalation injury

- Smoke inhalation injury doubles the mortality relative to burn size

Associated injuries

- Other trauma increased severity of injury

Delay in resuscitation

- Delay increases fluid requirements

- Makes resuscitation more difficult



2. DEPTH OF BURN

There are three types of burns:

- A) SUPERFICIAL: (1st Degree)-only outer most layer of skin is involved causing red ness, swelling and tenderness. It requires mild first-aid.
- B) PARTIAL-THICKNESS: (2nd Degree)-1%burn affecting layers of epidermis causing rawness and blisters. Requires medical treatment.
- C) FULL THICKNESS: (3rd degree)-all the layers of the skin are burnt causing severe damage to nerves, tissues and muscles. Skin may look waxy pale. Needs urgent medical attention.

4.2.4 MINOR BURNS AND SCALDS

Small, superficial burns are often caused by domestic accidents. Most can be treated by a first aider.

The aim of the treatment :-

1. To stop the burning sensation.
2. To relive pain and swelling.
3. To minimize the risk of infection.

TREATMENT

1. Reassure the patient
2. Dip the injured part in cold water for at least ten minutes to stop the burning sensation and relieve the pain.
3. Gently remove any rings, watches, shoes and other constricting clothing from the Injured area before it begins to swell.
4. Cover the area with a clean and sterilised material.
5. Give plenty of fluids orally.
 - DO NOT break blisters or otherwise interfere with injured area.
 - DO NOT apply adhesive dressings/tape.
 - DO NOT apply lotions/ointments/fats to the injuries as they can further damage the tissues and increase the risk of infection.

4.2.5 SEVERE BURNS AND SCALDS

Great care must be taken when treating burns that are deep or extend over a large area. The longer the burning continues, the more severe the injury will be.

Aim of the treatment is:-

1. To stop the burning and relieve pain.
2. To maintain an open airway.
3. To treat associated injuries.
4. To minimize the risk of infections.
5. To arrange removal to hospital.

TREATMENT:-

1. Make the patient comfortable.
2. Cool the burned area with plenty of cold water for at least 10 min.
3. While cooling the burn, watch for signs of difficulty in breathing.
4. Gently remove any jewellery, watches, shoes or constricting clothing before swelling begins.
5. Carefully remove burned clothing ONLY IF IT IS NOT STICKING TO THE BURN.
6. Cover the injury with a clean and sterile material.
7. For facial burns just keep cooling the injury with water to relieve the pain until help arrives or victim reaches the hospital.
 - DO NOT overcool the injured as it may lead to Hypothermia.
 - DO NOT remove anything sticking to the burns.

4.3 SHOCK

Shock is a condition in which the circulatory system fails to circulate oxygen – rich blood to all parts of the body. When vital organs, such as the brain, heart, and lungs, do not receive oxygen – rich blood, they fail to function properly; improper functioning organs trigger a series of responses. These responses are the body's attempts to maintain adequate blood flow to the vital organs, preventing their failure.

When the body is healthy, three conditions are needed to maintain adequate blood flow:

- The heart must be working well.
- An adequate amount of oxygen-rich blood must be circulating in the body.
- The blood vessels must be intact and able to adjust blood flow.

When someone is injured or becomes suddenly ill, these normal body functions may be interrupted. In cases of minor injury or illness, this interruption is brief because the body is able to compensate quickly, with more severe injuries or illnesses, however, the body may be unable to adjust. When the body is unable to meet its demands for oxygen because blood fails to circulate adequately, shock occurs.

4.3.1 WHAT CAUSES SHOCK?

The heart circulates blood by contracting and relaxing in consistent rhythmic pattern. The heart adjusts its speed and the force of its contractions to meet the body's changing demands for oxygen. For instance, when a person exercises, the heart beats faster and more forcefully to move more oxygen-rich blood to meet the working muscles' demand for more oxygen.

Similarly, when someone suffers a severe injury or sudden illness that affects the flow of blood, the heart beats faster and stronger at first to adjust to the increased demand for oxygen. Because the heart is beating faster, breathing must also speed up to meet the body's increased demand for oxygen. You can detect these changes by feeling the pulse and listening to breathing when you check for nonlife-threatening conditions.

For the heart to do its job properly, an adequate amount of blood must circulate within the body. The body can compensate for some decrease in blood volume.



Consider what happens when you donate blood. You can lose 1 pint (about ½ liter) of blood over a 10 to 15 minute period without any significant stress to the body. Fluid is reabsorbed from the kidneys, lungs, and intestines to replace lost blood volume. In addition, the body immediately begins to manufacture the blood's solid components. However, with severe injuries involving greater or more rapid blood loss, the body may not be able to adjust adequately. Body cells do not receive enough oxygen, and shock occurs. Any significant fluid loss from the body, such as from severe bleeding or burns or even from diarrhea or vomiting, can precipitate shock.

Regardless of the cause, any significant decrease in body fluids affects the function of the heart. The heart will initially speed up to compensate for loss of body fluids and eventually will fail to beat rhythmically; the pulse may become irregular or be absent altogether.

The blood vessels act as pipelines, transporting oxygen and nutrients to all parts of the body and removing wastes. For the circulatory system to function properly, blood vessels must remain intact, preventing loss of blood volume. Normally, blood vessels decrease or increase the flow of blood to different areas of the body by constricting (decreasing their diameter) or dilating (increasing their diameter). This ability ensures that blood reaches the areas of the body that need it most, such as the vital organs. Injuries or illnesses, especially those that affect the brain and spinal cord, can cause blood vessels to lose this ability to change size. Blood vessels can also be affected if the nervous system is damaged by injury, infection, drugs, or poison.

If the heart is damaged, it cannot circulate blood properly. If blood vessels are damaged, the body cannot adjust blood flow. Regardless of the cause, when body cells receive inadequate oxygen, the result is shock.

4.3.2 THREE TYPES OF SHOCK AND THEIR CAUSES :

Common Types of Shock

Type	Causes
Anaphylactic	Life-threatening allergic reaction to a substance, may Cause airway to swell, affecting ability to breath; can occur from insect stings or from foods and drugs.



Cardiogenic	Failure of the heart to effectively circulate blood to all parts of the body; occurs with heart attack.
Hypovolemic	Severe bleeding or loss of blood plasma; occurs with internal or external wounds or burns or with severe fluid loss as from vomiting and diarrhea.

When shock occurs, the body attempts to prioritize its needs for blood by ensuring adequate flow to the vital organs, such as the heart, brain, lungs, and kidneys. The body reduces the amount of blood circulating to the less important tissues of the arms, legs, and skin. This reduction in blood circulation to the skin causes the skin of a person in shock to appear pale or ashen and feel cool. In later stages of shock, the skin, especially the lips and under the nails, may appear blue from a prolonged lack of oxygen. Increased sweating is also a natural reaction to stress caused by injury or illness, which makes the skin feel moist.

4.3.3 SIGNS AND SYMPTOMS OF SHOCK:

Although you may not always be able to determine the cause of shock, remember that shock is a life threatening condition. You should learn to recognize the signs and symptoms of shock.

Shock victims usually show many of the same signs and symptoms. A common sign is restlessness or irritability. This behavior is often the first indicator that the body is experiencing a significant problem. Other clearly recognizable signs are pale or ashen, cool, moist skin; rapid breathing; and a rapid and weak pulse. If the victim does not show the telltale signs and symptoms of specific injury or illnesses, such as the persistent chest pain or heart attack, or obvious external bleeding, it can be difficult to know what is wrong. Remember, you do not have to identify the specific nature of an illness or injury to provide care that may help save the victim's life. If the signs and symptoms of shock are present, assume the victim has a potentially life-threatening injury or illness and proceed with giving care for shock.

4.3.4 GIVING FIRST AID TO A PERSON IN SHOCK

People who are injured in a disaster can go in to shock. This is due to bleeding from injury, which may be external or internal. Shock is common in people with dead injuries.

How do you recognize a victim who is in shock?

A person in shock can be recognized by the following features:

- looks pale;
- Hands and feet cold
- Unconscious



What can you do?

- Give immediate first aid to the person in shock.
- Wrap the victim in blankets.
- Give hot, sweet drinks to the victim.
- Do not leave the patient in shock unattended.

Raise the victim's legs above the level of the body

DONT'S

1. Never use hot water bottles or very warm rugs.
2. Do not rub any part of the body.
3. Do not give anything by mouth.



4.4 POISONING

POISON—A poison is any substance that enters the body and causes temporary or permanent harm.

4.4.1 METHODS OF POISONING:-

- a) By Swallowing
- b) By Gases
- c) By Injections.

A) POISONING BY SWALLOWING

Acids, Disinfectants etc when taken, burns the lips, tongue throat, food pipe and stomach. They cause great pain. Some can cause vomiting, pain and later on diarrhea.

b) POISONING BY GASES

Fumes or gases from charcoal stoves, household gas, motor fumes and Smoke from explosions etc causes choking and suffocation which may result in unconsciousness.

c) POISONING BY INJECTIONS

As a result of bites from some animals, insects, snakes or by hypodermic Syringes.



4.4.2 MANAGING POISONING

- IF UNCONSCIOUS:--Do not induce vomiting, make him lie in three - quarter Position-If breathing is slow, artificial respiration.
- IF CONSCIOUS: (NO CORROSIVE TAKEN), Help in vomiting, make him drink normal water, with 2 tbsp of salt.

Dilute the poison by giving iced water or coconut water.

- IF CONSCIOUS:
(CORROSIVE SWALLOWED) DO NOT INDUCE VOMITING,



TRANSFER TO HOSPITAL

COMMON POISONS AND THEIR MANAGEMENT

Poison	Cause	Management
1. Arsenic	Rat poisons	a. Induce vomiting
2. Aspirin	Aspirin Tablets	a. Induce vomiting. b. A drink of soda-bicarbonate to be given. c. Give strong tea/coffee.
3. Sleeping pills	Chemists	a. Induce vomiting. b. Give Magnesium Sulphate (2tsp in water). c. Give hot coffee and keep awake.
4. Lead	Paints, Hair dyes	a. Induce vomiting. b. Give Mag - Sulphahte in water. c. Give milk/white of egg/barley Water.
5. Petrol, Kerosene	Houses/ garages/ Industries	a. Give vegetable oil. b. If available, liquid paraffin as it delays the absorption of poison. c. Shift to hospital. d. DO NOT INDUCE VOMITING.



4.5 FIRST AID IN ELECTROCUTION

The Danger of electricity is that it surrounds us in our everyday lives, and it is easy to become complacent about it. The fraying plug on the iron, the bare wires on the vacuum flax, and the gaping plug sockets left uncovered with a toddler in the house are all electric shocks waiting to happen. Electricity harms because it can cause the heart to beat irregularly and then stop; the muscles, nerves and blood vessels to fry and the skin to burn, One – third of all victims of electrical accidents are children, and 20percent of these children die as a result.

One of the main causes of electric shock is contact with faulty electrical appliances or exposed wiring. Children poking sharp objects into sockets or chewing on electrical cords are other hazards, as is flashing from high – voltage power lines.

4.5.1 TYPES OF INJURIES:

LIGHTNING INJURIES :

The severity of an injury due to lightning depends on several factors:

- How long the victim is in contact with the electric current – the longer the contact, the greater the damage.
- The type of current – Alternate Current (AC) is used in electricity mains power cables, because it allows greater amounts of electricity to be sent down the power lines. It is more likely to cause cardiac arrest at lower voltage than Direct Current (DC), which is what batteries produce. AC may also cause muscle spasms, with the result that the victim cannot let go off the electrical source.
- The size of the current – overhead power cable and lighting are more damaging than electricity mains and the batteries.

ELECTRICAL ACCIDENTS :

If you touch someone who is still in contact with a live circuit, they may electrocute you. Make sure that the power source is turned off at the fuse box, or unplugged at the socket. Simply turning off the appliance will not work.



If you cannot turn off the power at source or unplug the appliance, try to separate the victim from the power using a non – conducting object, such as a wooden or plastic broom handle or chair or a rubber door mat. Try to do this while standing on some things dry and non – conducting such as a pile of dry newspapers, a telephone directory or a board.

If the source is a high – voltage current from a power line, be aware that the currents can jump a considerable distance. Do not approach the casualty until the power lines are off. Once they are free of the current, check if the casualty is breathing. If not, begin CPR.



4.5.2 TREATING THE CASUALTY :

Once you have excluded any further danger to yourself, approach the victim and assess them. If you are alone, call the emergency services now. Otherwise get someone else to do it for you.

Open the casualty's airway, being aware that if they have fallen or been thrown, they may have cervical spine damage. Avoid moving the head and neck, particularly if they are unconscious. If they are not breathing, begin to do mouth – to – mouth. Start to give cardiac compressions if they are not trying to breathe or move.

Be alert to other injuries if they have been thrown, and splint if necessary. If they have obvious burns, remove any clothing and rinse the burn under cool, running water. Apply a sterile dressing.

4.6 FIRST AID TO AN UNCONSCIOUS INDIVIDUAL

Unconsciousness is an interruption of normal brain activity. It can happen suddenly or gradually. Unconsciousness can be caused by a variety of injuries and medical conditions, as well as by a number of different drugs. An unconscious person may still have some reactions to pain or to commands or may have no reactions at all.



- Whatever the cause or degree of unconsciousness, the immediate emergency treatment remains the same.
- Assess whether the person is unconscious by gently squeezing the shoulders and asking a question.
- Open the airway by lifting the chin, clearing the mouth, and tilting the head.
- Check the breathing and be prepared to resuscitate.
- If the person is breathing, check for life threatening conditions and then turn into the recovery position
- Call for emergency help

This may be all that you have time to do before emergency help arrives. However, if you have more time, there are some things that you can do to gather information that may help medical staff with their diagnosis and treatment.

ASSESS THE LEVEL OF RESPONSE

There is an agreed scale for assessing how responsive an injured or ill person is-the Glasgow Coma Scale. A fully alert person will score 15 while somebody who is totally unresponsive will score 3 with several variations in between the observation chart. You can help collect information to inform medical staff using some of the checks from this scale.

EYES

Do they:

- Open without you having to ask the person to open them?
- Open on command?
- Open if you cause the person pain (this is often done by pinching the earlobe)?
- Remain closed?

MOVEMENTS

Does the person:-

- Understand and follow sensible instructions?
- Move only in response to pain?
- Not move at all?

SPEECH

Does the person:-

- Answer the questions sensibly?
- Answer the questions in a confused way?
- Make sounds that cannot be understood?
- Make no noise?
- Do these check every 10 minutes and record your answers if you can.

MONITOR AND RECORD BREATHING AND PULSE RATE

Breathing is measured by counting the number of breaths in 1 minute (one breath being one rise and fall of the chest). Pulse rate is measured by counting the number of beats at the pulse at either the neck or the wrist for 1 minute. Take these recordings every 10 minutes and write them down if possible. The easiest place to feel a pulse is the carotid artery in the neck, though you can check the wrist.

EXAMINING THE UNCONSCIOUS PERSON

Your initial check of the injured or ill person will be for life-threatening conditions, particularly serious bleeding. If you have more time while waiting for the ambulance, a more thorough check may show up less serious injuries or illness and potential clues to the cause of unconsciousness. This check should never be at the cost of monitoring and maintaining the airway or keeping the injured person as still as possible. If doing a check of the body, it is sensible to do so in the presence of a third person.



Check the body from head to toe, looking for areas of bleeding, or broken bones or burns, or clues as to the cause of unconsciousness.

Potential causes of unconsciousness and some clues to diagnosis

Cause	Clues
Hypoglycemia (low blood sugar)	Card declaring diabetes, diabetic medication.
Epileptic fit	Card declaring epilepsy. Medication.
Head injury	Blood, spinal fluid from ear or nose, dent or bump on the head or uneven pupils.
Stroke	Paralysis on one side of the body (may be apparent in some body with a higher level of consciousness); uneven pupils.
Heart attack	Details from bystanders (e.g. collapsed holding his chest), pale skin, and blue lips.
Poisoning or drugs	Evidence of drugs or poisons e.g. medicine bottles, syringes, empty canister with poison label, etc. Abnormal heart and /or breathing rate / rhythm.
Fainting	pale before falling, pale falling. May have epileptic-type movements afterwards.

4.6.2 MEDICAL CAUSES OF UNCONSCIOUSNESS

There is an agreed scale for assessing how responsive an injured or ill person is-the Glasgow Coma Scale. A fully alert person will score 15 while somebody who is totally unresponsive will score 3 with several variations in between the observation chart. You can help collect information to inform medical staff using some of the checks from this scale.

Coma Scale

Glasgow coma scale - is used as a quantitative measure of conscious state. It is an important tool, but should be used in conjunction with a full neurological assessment to fully assess the child's neurological state.



EYE OPENING		VERBAL RESPONSE		MOTOR RESPONSE	
Spontaneous	4	Oriented	5	Obeys command	6
To Speech	3	Confused	4	Localizes to Stimuli	5
To Pain	2	Inappropriate words	3	Withdraws to Stimuli	4
Nil	1	Incomprehensible words	2	Abnormal flexion	3
		Nil	1	Extensor Response	2
				Nil	1

I. EPILEPSY

Epilepsy is a disease of the nervous system, which is characterized by sudden attacks of unconsciousness known as fits. Two varieties of this complaint occur – major epilepsy (grand mal), in which the attacks of unconsciousness are accompanied by convulsions, and minor epilepsy (petit mal) in which convulsions are absent.

The disease usually begins in early adult life and fits may occur at intervals, depending upon the severity of the case. Thus, in slight forms of the disease, only one or two fits occur during the course of a year, but in more serious cases fits may recur at short intervals. In severe cases, there may be a sequence of convulsions without regaining consciousness. This is known as 'status epilepticus'. Fortunately, doctors can prescribe a combination of drugs which can prevent the occurrence of attacks.

Major epilepsy

A patient who is about to have an epileptic fit often experiences a warning, known as the 'aura', which calls his attention to the fact that an attack is imminent. This warning may provide him with an opportunity of placing himself in a position of safety before he is overcome by unconsciousness.

This aura takes the form of some subjective sensory premonition, such as numbness, giddiness or even a certain smell, which warns the patient that a fit is imminent.



Soon after the aura the patient may utter a shrill cry and drop to the ground, sometimes hurting himself severely through his fall. He is now immediately and completely unconscious and passes into the first stage of the fit, known as rigidity (tonic phase). Alternatively, the fit may commence with gradual twitching in one part of the body, which spreads until the whole body twitches (clonic phase) and the patient lies unconscious.

Minor epilepsy or petit mal

This is a less serious form of the disease, in which a patient is seized with an attack of unconsciousness but there are no convulsions. Suddenly, perhaps in the course of a conversation, the patient will stop speaking and his eyes will appear to have become fixed, with a dreamy stare.

The attack may be so slight as not to be noticed, except by a careful observer and the patient himself. The disease is of importance, for it may develop into major epilepsy, or an attack may be followed by any of the complications of the major disease. No treatment other than medical attendance is required.

Rigidity

The patient lies on the ground, absolutely stiff, his fists clenched and all his muscles rigid, so that it is impossible to bend his arms or legs. The teeth are firmly clenched and the mouth cannot be opened. The muscles of respiration are similarly in a state of spasm, and thus the patient is unable to breathe; for this reason his colour changes rapidly. He is at first pale, but quickly becomes blue (cyanosed).

The eyes may remain open and turned to one side; moreover, owing to the temporary cessation of respiration with contracted muscles, the whites of the eyes become red and congested.

The patient exhibits a pitiful appearance at this stage, and just as it would appear that he is on the verge of death, twitchings begin in his body as the attack passes into the stage of convulsions.

Convulsions

Forcible and involuntary muscular contractions now involve all the muscles in the body. The convulsions extend to the muscles of the jaw, and the



saliva in the mouth is beaten up into a foam. Moreover, the tongue and cheeks are frequently bitten, thus blood-stained froth may be seen escaping from the lips.

The face assumes a purplish colour, and the eyeballs appear to be protruding from their sockets. Urine and faeces may be passed involuntarily. This stage lasts from two to three minutes, but breathing, though jerky, prevents death by asphyxia. The convulsions gradually pass off and the breathing becomes easier.

Consciousness may quickly be recovered and the patient is left pale, sweating, and exhausted. He shows little interest in his surroundings and may express the desire for sleep, a tendency which should be encouraged. Sometimes, however, consciousness is not recovered immediately and the patient gradually passes into a condition of coma. Coma gradually passes into a natural sleep, from which the patient finally awakes.

TREATMENT

An epileptic fit is a very unpleasant sight to witness and the first aider must not be alarmed by the appearance of the patient. Fortunately, death in an attack is extremely rare, and a competent first aider can do much for the patient at this stage. It is important, however, to reassure relatives and bystanders who may be present that the fit will quickly pass off and the patient recover. Treatment of a fit can be considered under its respective stage as follows :

STAGE OF RIGIDITY

The most important first aid measure is to ensure that the patient does not further injure himself. He should be able to lie flat and all objects removed from his vicinity.

Airway If the patient can be supported on his side, this will be of value in maintaining his airway. It will not be possible to force open the patient's jaw, and forcing a gag between the teeth is undesirable at this stage.

Clothing : Undo tight clothing around the neck, chest and waist.

Space and time Keep back bystanders. It must be remembered, however, that the stage of rigidity only lasts about half a minute, so there is not much time available for treatment (or indeed a need for it).



Apply gag. The patient's jaw will relax slightly; this may allow a protective gag to be placed between the teeth to prevent further biting of the tongue. The gag should be a firm object which has been wrapped in some soft material, e.g. a handkerchief. The airway should be maintained by clearing any debris or false teeth from the mouth if possible, and supporting the patient on his side.

Source of danger. Continue to ensure that all objects and persons are clear off the patient's side.

STAGE OF RECOVERY

Examination. A quick examination of the patient should be made to discover injuries caused by the initial fall; wounds of the scalp and even fractures are not uncommon complications of a fit.

Encouragement and rest. The natural tendency for sleep should be encouraged, but the first aider must arrange for the patient to be watched in case the fit recurs.

Promoting comfort. If temporary removal to a suitable shelter is possible – as, for example, to a neighbouring house – the patient should be made comfortable in bed with extra wraps, and the room kept quiet and darkened. A non-stimulating drink, such as diluted milk, may be given (Providing no injury has been sustained). The patient should be kept under close observation for several hours, as behaviour during recovery may be abnormal.

Medical aid. The services of a doctor should be obtained immediately if the patient shows a tendency to recurring fits; in any case, the first aider should advise his patient to obtain medical treatment.

POST-EPILEPTIC COMPLICATIONS

Automatism

Occasionally after an epileptic fit, instead of the normal return to consciousness, the patient may perform an action of which he is entirely ignorant at the time and which he cannot recall afterwards: e.g. he may commence undressing, or even act violently towards bystanders.



Mania

Temporary insanity may occasionally follow a fit. The first aider will appreciate that his primary duty when confronted by a post-epileptic complication is to restrain the patient from doing harm to himself or others, pending the arrival of medical aid.

II. STROKE

Stroke is the common term for a condition of altered consciousness occurring suddenly, usually in elderly people, due to haemorrhage into the substance of the brain (cerebral haemorrhage) or clotting of one of the brain's blood vessels (cerebral thrombosis).

Causes

This condition may be associated with high blood pressure or hardening of the arteries. Patients susceptible to a stroke may experience warning symptoms for some time prior to the onset of the stroke. Giddiness, persistent headaches, shortness of breath, and nose-bleeding should call attention to the possibility of raised blood pressure. If medical attention is sought at this stage, strokes may be prevented by treating the high blood pressure with suitable drugs.

Symptoms and signs

A stroke may occur at night, when the patient is resting or asleep, or after exertion. The patient may be sized by sudden headache or giddiness or may collapse without warning. He may develop complete or partial loss of consciousness, or simply become confused or disorientated.

The temperature of the body is raised and the face may be flushed. The pulse is usually slow and strong, and the breathing becomes characteristic, being accompanied by snores and puffing out of the cheeks on expiration.

The pupils may become unequal and fail to respond to light, while the head and eyes are often turned towards the affected side of the brain.

It is well known that a stroke is usually followed by paralysis of one side of the body and, even in the stage of unconsciousness, the affected side will often be found to be more limp than its opposite, while the corresponding cheek is smooth and puffed out.



Diagnosis

It may be stated that stroke is the most common cause of insensibility in patients over the age of forty-five, and since first aid diagnosis is only intended to be provisional in character, little harm will be done to an elderly Patient who is found unconscious by assuming that he is suffering from a stroke and treating for this condition before medical aid arrives.



It is important to exclude the possibility of poisoning or diabetes, but this is usually easy, for in these cases clues suggesting poisoning are often found, while the circumstances in which the patient is taken ill (for example, while obviously on his way to work) generally point to the onset of a sudden illness rather than an attempted suicide .

Confusion of stroke with the state of alcoholism, however, has frequently occurred in practice, and it must be emphasized that the mere smell of alcohol on the breath does not in itself merit a diagnosis of drunkenness, for a patient may have been feeling ill at the onset of the fit and purposely taken an alcoholic drink.

The first aider must not be misled by a rapid return to consciousness, for in a number of cases there is a quick recovery, but the patient remains extremely susceptible to recurrence.

It must also be remembered that not every case of stroke conforms to the type described above, and various modifications are possible according to the area of the brain affected. Thus, sudden loss of speech occurs in certain forms of stroke, although there may be no other paralysis.

Treatment

The golden rule in the treatment of cases of suspected strokes is to examine the patient as little as possible and to avoid moving him more than what is absolutely necessary. Thus, wherever possible, the patient

should be allowed to remain lying where he has fallen. It is quite feasible, for example, in the home, to make up a bed on the floor and to carefully move the patient on to it. Any attempt to carry the patient may easily end fatally by increasing the hemorrhage.

If it is essential to move a patient, for instance when the seizure has occurred in the street, careful and gentle handling is essential if bleeding is to be kept to its minimum.

Airway. Maintenance of the patient's airway is always of prime importance. The recovery position should be used for the unconscious patient.

Care of the mouth. False teeth should be removed and carefully preserved. If the mouth is allowed to fill up with saliva there is always the risk that some of the saliva may be sucked down into the lungs and cause bronchopneumonia, a common and often fatal complication.

Warmth. The patient should be covered with a blanket, and suitable wraps placed under him and tucked well in at the side and feet. Care should be taken not to allow the patient to lie on keys, coins, or other sharp objects.

Major inactivity is the most important treatment to adopt after the above procedures have been undertaken. It comprises doing absolutely nothing beyond watching the patient and appreciating the fact that additional treatment, such as trying to give stimulants or medicine, will do more harm than good. It is one of the most difficult treatments to apply in medical work and first aid.

Medical advice is always essential, since in some cases people are treated at certain special hospitals by a surgical operation on the blood vessels in or around the brain.

III. INFANTILE CONVULSIONS

Fits occurring in infants and children are known as infantile convulsions.

The complaint is most common up to the age of eighteen months, but convulsions may occur in older children.



Causes

The most common cause precipitating a convulsion in the pre- school child is a sudden high grade fever, the nature of the infection being less important than the speed and height of the temperature.

There are other potential causes, such as hypoglycemia, meningitis, tetany, intracranial hemorrhage, ear infection, reaction to drugs and teething.

Symptoms

An infant liable to develop a fit will often show signs of general nervous irritability for some time before the actual onset of convulsions. Thus it may be somewhat jerky in its manner, and restless. The actual signs of the fit itself may be summarized as follows:

Breath-holding. The infant develops irregularity in breathing, or may stop breathing for a second or two.

Rigidity. He throws his head back and becomes stiff all over.

Altered colour. Alteration in the colour of the face may vary, from slight pallor or sallowness to marked blueness of the face or limbs.

Twitching: The infant may not exhibit true convulsions as have been described in epilepsy. Some twitching of the body will, however, be noticed in the majority of cases.

Squinting and frothing at the mouth are occasional signs.

Treatment

It must be remembered that fits in childhood cause alarm to parents but are only rarely fatal. The parents should be reassured, therefore, that the child will soon recover and that there is no need for them to worry whilst medical aid is being sought.

General measures to protect the convulsive child from harming himself are most important. Where there is high fever, try sponging or fanning it. It may bring down the temperature and prevent further fitting.

Send for medical aid to determine the cause of the fit and obtain advice as to aftercare.



IV. FAINTING (SYNCOPE)

Fainting or syncope is a state of temporary unconsciousness due to diminished blood supply to the brain. The cerebral ischaemia may be due to any of the following causes, which are frequently combined:

1. Exhaustion, lack of food, or exertion while in a state of fatigue.



2. Emotion, especially fright or fear.
3. Accidents, including minor accidents, especially those involving loss of blood.
4. Lack of fresh air; close atmosphere and heat.
5. Posture, e.g. standing for a long time on a hot day or suddenly standing upright after resting.

Symptoms and signs

The patient feels giddy, swoons and falls to the ground. The face is pale, the skin is cold, clammy and covered with sweat. The pulse is quick and feeble and may become almost imperceptible at the wrist.

Treatment

Lay the patient down. A quick examination must be made to exclude the presence of haemorrhage, e.g. burst varicose veins. Any bleeding must be arrested before treating the faint. In the absence of haemorrhage the treatment is as follows:

Position. The patient should be kept lying down with his head and shoulders low, and the feet raised and supported in an elevated position. If unable to lie down, the head may be placed down between the knees, but recovery is quicker when the patient is laying flat.

Warmth. Covering the patient with blankets or with coats, etc. borrowed from bystanders will prevent him becoming cold or wet, this can be a problem.

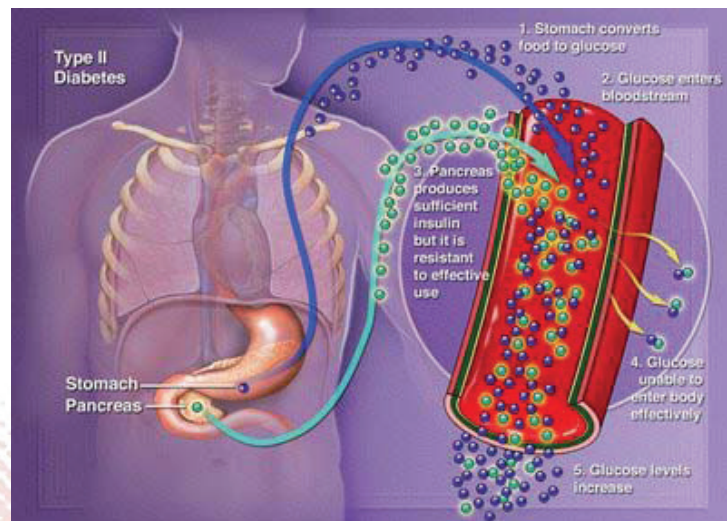
Clothing. Tight clothing round the neck, chest and waist must be loosened or removed.

Space. Instruct bystanders to avoid crowding the patient. If it is necessary to remove the patient from a crowded room, a stretcher should be used.

Fluids. On return to consciousness, hot tea or coffee, to which sugar has been added, may be given in sips, but it is undesirable to give too much at a time owing to the risk of vomiting.

V. DIABETES MELLITUS

Diabetic patients are always liable to lose consciousness due to a progressively decreasing amount of sugar in the food (hypoglycemic). The effect of low blood sugar may be quite rapid, and circumstances in which it has not been possible to obtain adequate food, perhaps due to a long



journey or delays, are very liable to precipitate an attack.

On the other hand, though this is much rarer, patients may over-inject themselves with insulin or fail to take the meal which should follow within half an hour of the injection. Patients on oral anti-diabetic drugs may also suffer hypoglycemia if a meal is missed.

Hypoglycaemic coma (low blood Sugar)

Diagnosis

There may be history of missing or irregular meals, unaccustomed exercise or an overdose of insulin. Behavior before may be quite normal, or may resemble or be mistaken for drunkenness.

The face is pale and the skin shows profuse sweating when blood sugar is very low. Breathing is shallow and the pulse rapid, though this may become weaker and difficult to feel as unconsciousness approaches.

Treatment

Provided the patient is still conscious and can swallow, the treatment is simple and recovery dramatic. The ability to swallow can be tested by tipping a spoonful of water into the side of the mouth. If this is swallowed, he should be given heaped spoonful of sugar in half a cup of water. This should be repeated if recovery is not complete.

If the patient is already unconscious a doctor may give the sugar solution via the rectum or intravenously. Nothing should be given by mouth. Most diabetics carry sugar with them in anticipation of an impending hypoglycemic attack.

Hypoglycemic coma may occur quite rapidly. Once the patient is unconscious, fits may occur, and urgent medical help is required to prevent serious brain damage.

Rebound low blood sugar is possible, so the patient should be checked by a doctor.

Hyperglycaemic coma (high blood sugar)

This emergency may result from lack of insulin. It is usually precipitated by illness, excitement, fatigue or over-indulgence. It is much less likely to occur without warning, and is usually preceded by a variable period of ill health.



Diagnosis

The skin is dry and the patient complains of headache and increasing drowsiness, which deepens in to coma. Breathing becomes prolonged and sighing with 'air hunger'. The breathing has a characteristic smell of nail varnish (acetone) and reflexes are diminished. The patient's tongue is very dry and he may complain of thirst.

Treatment

Medical aid should be sought as quickly as possible, or the patient urgently removed to hospital. Meanwhile, he should be kept warm and quiet. If there is doubt about cause of decreased conscious level in a known diabetic, the administration of a sugary drink to the patient (providing he can take it) is safer whilst awaiting medical help: this will do no harm and help, as confusion may easily occur between hyper-and hypoglycaemia.

VI. URAEMIA

Uraemia is the term applied to a serious complication of kidney disease, due to an accumulation of poisonous substances in the bloodstream which would normally be removed from the body by the kidneys. Uraemia may take several forms, e.g.:

1. Increasing drowsiness leading to a deep sleep; this is by far the commonest form.
2. Recurrent fits occurring in elderly people are suggestive of this complication.
3. A seizure resembling stroke.
4. Coma, with distressed respiration.

Patients suffering from uraemia are usually already under medical care, which has been sought as a result of warning symptoms. It is necessary, therefore, to summon medical aid immediately, and in the meantime to keep the patient quiet, warm and comfortable.

Coma due to uremia is very unlikely in a previously healthy patient.

4.7 EFFECTS OF HEAT AND COLD

The human body is designed to work best at or close to a temperature of 37°C (98.4°F). To maintain this temperature, the body possesses mechanisms that generate and conserve heat when the environment is cold and conversely that lose heat when it is hot. These mechanisms are controlled by a special center in the brain. In addition, humans control their environment to some degree through clothing, heating and air-conditioning, which makes it easier for the body to perform well in a wide range of temperature. In spite of all this, excessive heat or cold can still cause serious or even fatal injury.

4.7.1 THE BODY TEMPERATURE

To keep the body temperature within its optimum range of 36-38°C (97.8-100.4°F), the body must maintain constant balance between heat gain and heat loss. A “Thermostat” deep within the brain regulates the balance.

A) HOW THE BODY KEEPS WARM:

Heat is generated in the body by:-

- Conversion of food to energy in the body cells.
- Muscle activity.

Heat is absorbed:-

- From outside sources-sun, fire, hot air etc.

In cold conditions the body saves heat by:-

- Constricting blood vessels at the body surface to keep warm blood.
- Reducing sweating.
- Erecting body hair to trap warm air at the skin.
- Bringing the body's fat.



B) HOW THE BODY LOSES HEAT

Heat may be lost by:-

- Cool surrounding air- by radiation and by evaporation from the skin and in breath.
- Cool objects in contact with the skin which provides a pathway for heat to escape.

In hot conditions, the body reacts and loses heat by:-

- Blood vessels that lie in or near the skin dilating to lose blood heat.
- Sweat glands becoming active and secreting sweat; heat is then lost as the sweat evaporates from the skin into the cooler air.
- Increased rate and depth of breathing; warm air is expelled and cool air is drawn in to replace it.

The body reacts to cold by shutting down blood vessels in the skin to stop “core heat” escaping.

4.7.2 EFFECTS OF EXTREME COLD

1. FROSTBITE

When deprived of warm blood, extremities such as fingers or toes may freeze in severe conditions causing frostbite. This condition usually occurs in freezing and often dry and windy conditions.

Signs and Symptoms:-

- At first “pins-and-needles”.
- Paleness followed by numbness.
- Hardening and stiffening of the skin.
- A color change to the skin of the affected area: first white: then mottled and blue; and eventually; on recovery, red, hot, painful and blistered.

Treatment:-

Aim of the treatment is:

- To warm the affected area slowly, to prevent further damage.
- To obtain medical-help, if necessary.
 1. Remove the patient to shelter. Remove clothing over the affected area.
 2. Remove constrictive things like rings or watches.
 3. Warm the affected parts with your hands.
 4. Place the injured part in hot water if available.
 5. Elevate (raise) the affected parts to relieve swelling and pain.
 6. Lightly cover the affected part with soft dressing /cloth.
 7. Shift the patient to hospital.

DO NOT :

- Let the patient walk on a defrosted foot.
- Rub or massage the part affected by snow.
- Break blisters/apply ointments to injured area.
- Rewarm by dry or radiant heat.

This is caused by prolonged exposure to near freezing temperature in damp, slushy conditions and can be aggravated by lack of mobility, tight shoes and wet socks. The feet will be white, cold and numb, then red hot and painful on rewarming.

2. HYPOTHERMIA

This condition develops when the body temperature falls below 35°C (95°F). Moderate Hypothermia can usually be completely reversed. however, deep hypothermia (core temperature <26°C) is often; though not always fatal; it is always worth persisting with resuscitation until a doctor arrives to assess the condition.



HOW HYPOTHERMIA OCCURS?

Hypothermia may develop due to:

- Very low environmental temperature.
- Prolonged immersion in cold water.
- Inadequate protection in cold water.
- Exhaustion in cold climate.
- Wearing wet clothes.
- High altitude.
- Unheated or poorly heated house for long periods

SIGNS AND SYMPTOMS

- Shivering which is intense.
- Cold, pale and dry skin.
- Muscle in coordination and slurred speech.
- Irritability, confusion and restlessness.
- Slow and shallow breathing.
- Loss of consciousness.
- Breathing and heart beat become increasingly difficult.

TREATMENT

Aim of the treatment is:

- To prevent the patient from losing more heat.
- To rewarm the patient.
- To obtain medical help.

a) For indoor patients:

- For a patient brought in from outside, quickly replace any wet clothing with warm, dry garments.
- If the patient is young, fit and able to walk again then he can bathe with warm water.
- Put the patient in a bed and ensure that he is well-covered.
- Give him warm drinks, soup etc.
- Inform/call upon a doctor if the patient is old or a small child.
- If the patient becomes unconscious, open the airway and check breathing and if required, resuscitate.



DO NOT PLACE HEAT SOURCES SUCH AS HOT WATER BOTTLES OR FIRE NEXT TO THE PATIENT.

DO NOT GIVE ANY ALCOHOL.

b) For outdoor patients:

- Provide warmth with extra clothing or blankets and cover his head.
- Carry the patient to a sheltered place as quickly as possible. Protect the patient from the ground. Put him on a dry cloth, cover with blankets or newspaper. If cloth not available then make a thick layer of dry insulating material like leaves and branches or sticks etc.
- Send for help.
- If conscious, give warm drinks if available.
- Always check pulse and respiration after every one minute.

4.7.2 EFFECTS OF EXTREME HEAT

When the atmospheric temperature is the same as your body temperature, the body cannot lose heat by radiation or evaporation. If there is also a humid atmosphere, sweat will not evaporate from the body. In these circumstances particularly during strenuous exercise or hot weather, when the body generates more heat, HEAT EXHAUSTION OR HEAT STROKE can occur.

SIGNS AND SYMPTOMS

HEAT EXHAUSTION	HEAT STROKE
a) Headache, dizziness, slower onset nausea, vomiting, abdominal cramps, collapse.	a) A dangerous situation coming on suddenly, but it may follow untreated Exhaustion.
b) Unconsciousness follows	b) Unconsciousness rapid but may Come up after headache.
c) Face pale with cold, sticky, sweat.	c) Face flushed, skin hot and dry.
d) Pulse: weak.	d) Pulse: Full and bounding.
e) Temperature: normal	e) temperature: rises rapidly upto 107°F
f) Symptoms of shock	f) death will occur soon if temperature not decreased

MANAGEMENT

Aim of management is:

- To replace lost fluid and salt.
- To cool down the patient if necessary.

1. HEAT EXHAUSTION:

- A) If the patient is Unconscious then follow the general rule.
- B) If the patient is conscious:
 - Move him to a cool place.
 - Give plenty of salted water (1/4 tsp of salt in a glass of water).
 - Watch for the development of heat stroke.

2. HEAT STROKE: BRING DOWN THE BODY TEMPERATURE QUICKLY.

- Remove clothing and sprinkle cool water (preferably iced water) on his body or wrap him in a thin wet sheet and fan him.
- The temperature should not fall $< 102^{\circ}\text{F}$.
- On recovery, treat as for heat exhaustion.

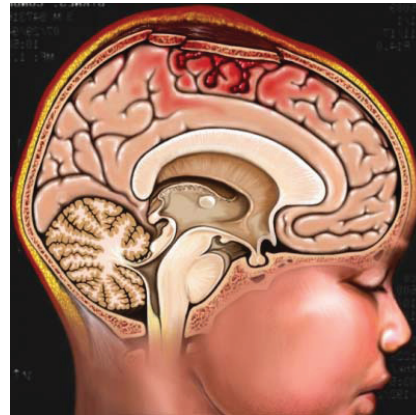


4.8 HEAD INJURY

4.8.1 INTRODUCTION

The human brain is a complex organ that allows us to think, move, feel, see, hear, taste and smell. It controls our body, receives information, analyses it and stores it. The brain of an average adult is one of the largest organs of the body.

The brain is covered by meninges (three membranes) and cerebrospinal fluid(CSF) that provides cushion to the brain from jolts.



If there is significant force against the skull, the brain inside the CSF moves or turns. This movement of brain plus the damage to the tissues directly beneath the blow ,are responsible for the symptoms associated with Head Injury(H.I).

a) CLASSIFICATION OF VARIOUS TYPES OF ACUTE HEAD INJURIES

1. SKULL-Fractures	
2. MENINGES AND THEIR SPACES	Epidural hemorrhage Dural Laceration Subdural hemorrhage Subarachnoid hemorrhage
3. BRAIN:	Concussion Contusion Laceration Intracerebral Haemorrhage

4.8.1 CAUSES OF INJURIES

- Road accidents
- Sports
- Illness and intoxication
- Mining
- Blasts

The fractures and hemorrhages are the conditions that need hospitalization, there are certain conditions where if we are aware of the signs and symptoms and timely identified first-aid is given, the damage could be minimized and a life can be saved. Some of them are discussed further.

1. CONCUSSION

A concussion may be defined as a transient cerebral paralysis. It is the least serious form of brain trauma. In this condition, the temporary disturbance of the brain occurs.

Signs and symptoms:-

- Brief or partial loss of consciousness.
- Breathing may be shallow.
- Face may be pale.
- Skin may be cold and clammy.
- Rapid and weak pulse.
- Nausea and vomiting.
- On recovering consciousness, he may not remember any events just before or after the incident.

Management of Concussion:-

- a) If the patient is conscious and there is any wound then treat the wound/bump.



b) If Unconscious then manage in following ways:

- See that there is a free supply of fresh air and air passages are free.
- Make the patient lie flat in a comfortable position.
- Keep back the crowd, they only obstruct.
- Loosen clothing at the neck, chest and waist.
- If breathing has stopped or about to stop then start CPR (cardio Pulmonary Resuscitation).
- If breathing is noisy, then support the patient in three-quarter prone position.
- Watch continuously for any changes in the condition. DO NOT LEAVE THE PATIENT UNTIL MEDICAL HELP ARRIVES.
- No form of drinks should be given.
- On return to consciousness, wet the lips with water.

2. CONTUSION

More serious condition. Contusions are associated with damage to the brain substance itself. The damage with contusion is more extensive than that seen with concussions. Contusions are often associated with other serious injuries like cervical fractures.

Signs and Symptoms:

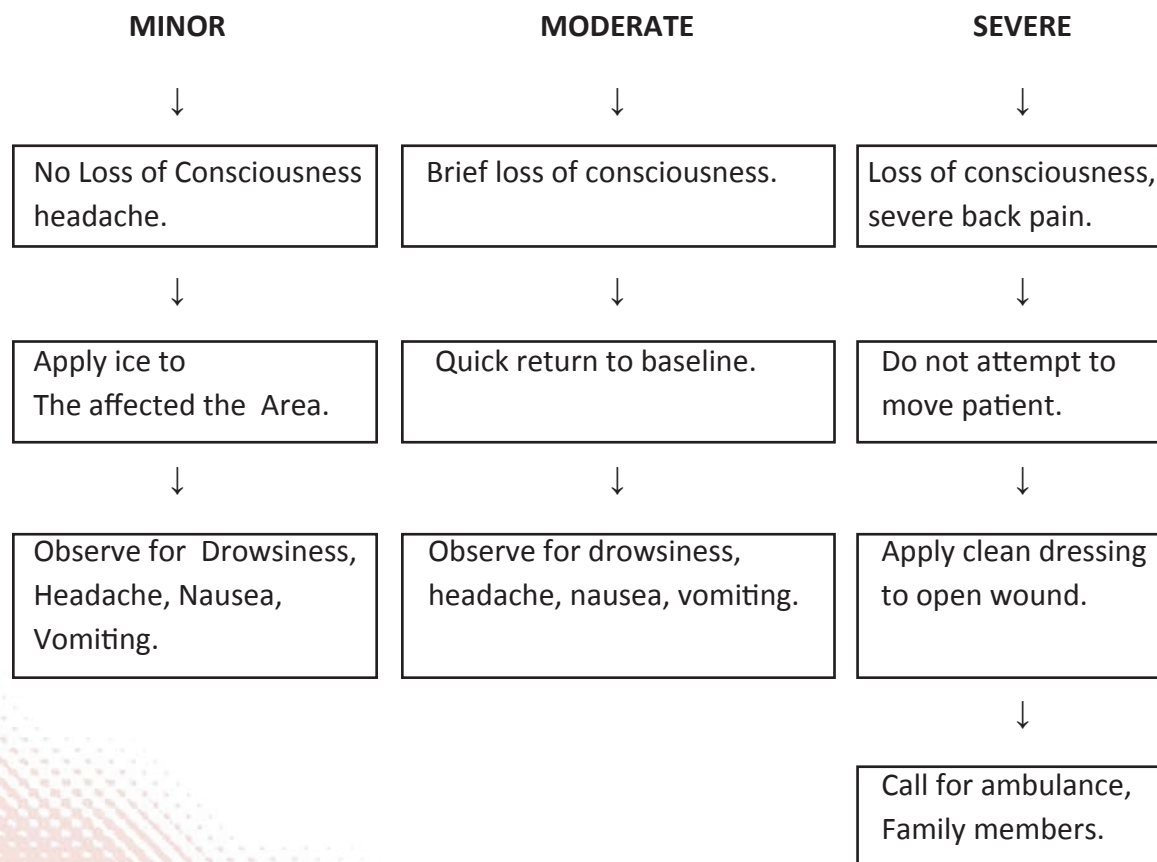
- At first may be stupor followed by coma.
- Noisy breathing.
- Flushing of face and rapid pulse.
- Raised temperature.
- Paralysis of one side or a part of the body.
- Convulsions in some cases.



Management:-

1. As the patient becomes unconscious, manage as stated in the contusion patient.
2. Shift the patient immediately to the hospital.

Head Injuries may further be classified on the degree of injury:



4.9 SNAKE-BITE AND ITS MANAGEMENT

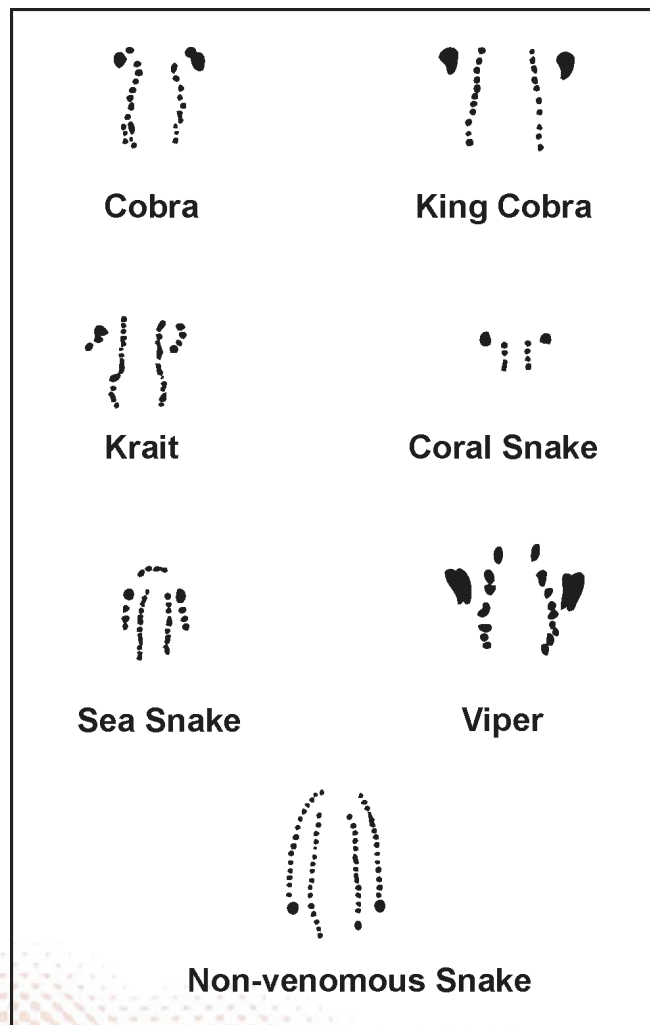
There are more than 2500 different kinds of snakes. Only about 200 of them are venomous (poisonous).

- All snake-bites are not poisonous.
- Only a small quantity of venom(snake poison) may be fatal.

Distinguishing between the patterns of snake-bite:

a) Non-Poisonous

b) Poisonous



Aim of the Treatment:

- To reassure the person.
- To stop spreading of venom.
- To obtain medical help.

Signs and Symptoms:

- Pain and numbness at the site of bite.
- Drowsiness.
- Burning pain at the site.
- Swelling.
- Dimness of vision.
- Difficulty in breathing and speech.
- Area becomes bluish purple after bite in 12 Hrs.
- Dribbling of saliva and paralysis.
- Convulsions, coma.

Management:

- Lay the patient down
- Calm him down → DO NOT MAKE HIM WALK
- Apply a constrictive (tight) bandage between the wound and heartside
- Wash the area with lots of water
- Cover the wound with a clean cloth
- Carry the patient to hospital on a Stretcher.

Do not suck the poison. It is a controversial practice.

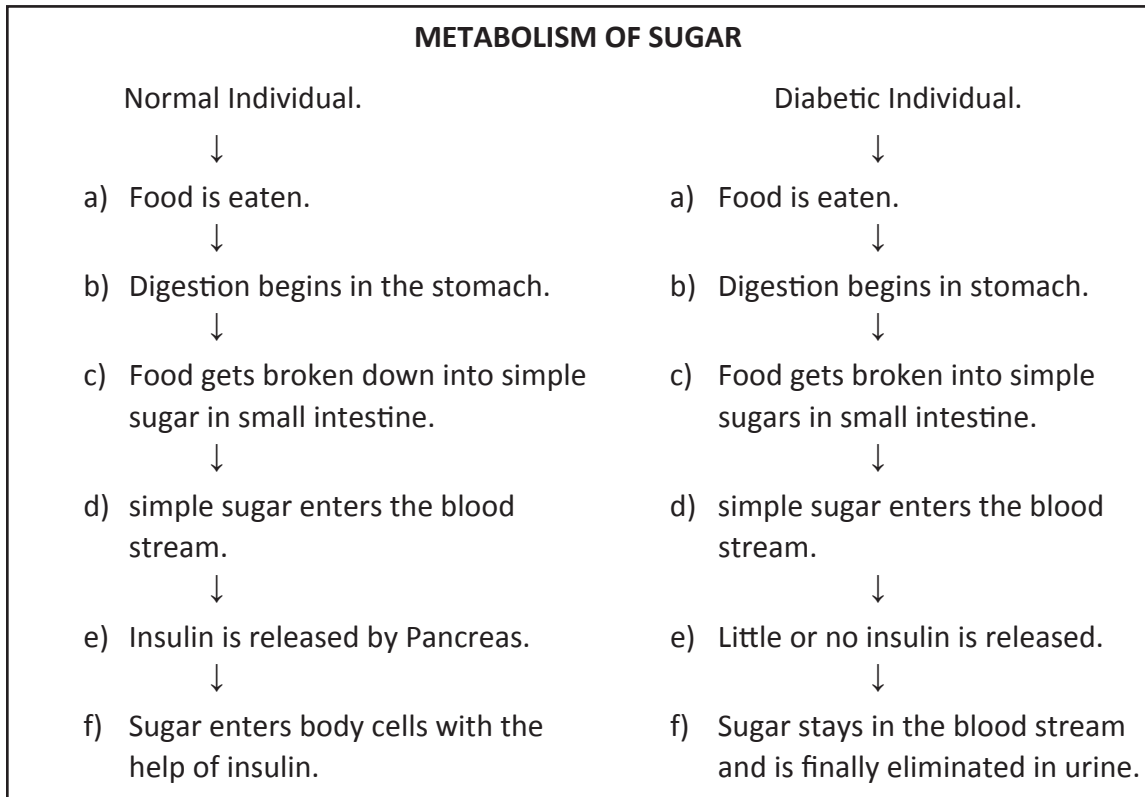
If the snake has been killed, take it for identification.

If breathing stops, give artificial respiration.



4.10 DIABETES & ITS MANAGEMENT

All cells require sugar for normal functioning and for conversion as an energy source. diabetes makes the body incapable of utilizing the sugar as an energy source because of deficiency in Insulin.



4.10.1 TYPES OF DIABETES

There are two types of Diabetes:

- 1) IDDM (Insulin dependent Diabetes Mellitus/Juvenile)
- 2) NIDDM (Non-insulin dependent diabetes mellitus/maturity onset)

IDDM is of major concern since it appears before the age of 15 Years. The therapy for such cases are Insulin injections and careful planning of diet.

The EMERGENCY CONDITION which can occur in children is either Diabetic Ketoacidosis or Hypoglycemia

HYPOGLYCEMIA: Too little sugar in the blood.

Causes:-

- The diabetic child has eaten too little food.
- The child has missed a meal.
- The child takes too much “insulin by mistake”.
- Too much of playing/exercising in the school.

Signs and Symptoms:

- Dizziness
- Headache
- Skin moist with sweating
- Breathing is shallow and quiet
- Fainting
- Visual disturbances.

MANAGEMENT:

1. IF CONSCIOUS:--Immediately give sugar/chocolate/glucose water etc.
2. IF UNCONSCIOUS BUT BREATHING NORMALLY:
 - Place in left lateral position.
 - Shift to hospital immediately/inform parents.

4.11 ASTHMA

Recognising asthma

- Difficulty in breathing often accompanied by coughing
- Wheezing on breathing out
- Distress and anxiety
- Tiredness from laboured breathing
- Bluish tinge to face and lips

Treatment

1. Ensure the room is well-ventilated and smoke-free.

IF it is a first attack, CALL A DOCTOR

IF the attack is severe or does not respond to medication, CALL AN AMBULANCE.

- 2 Help the child to relax. Sit her down with her arms resting on a table or on your lap. Reassure her as she will be frightened.

IF the child has special medication, use it early in any attack, see below.

Taking medication

If the child has medication, let him use it. Follow the directions carefully. The attack should ease. If it does not, CALL AN AMBULANCE

Various types of medication are prescribed. Familiarise your child with his medication so that he knows how to use it when he has an attack.



SIT her forward to ease breathing

OR



SIT her on your lap



Help him to use his inhaler, if he has one

4.12 DENTAL EMERGENCIES

Most Emergencies Seen the Same Day

Dental injuries require immediate attention and appropriate response. Knowing how to handle these emergencies can make the difference between saving or losing a tooth.

BAD - BREATH

1. Brush your teeth after every meal with toothpaste.
2. Do not brush your tongue, use a tongue scraper to clean you tongue regularly and floss daily.
3. If you wear dentures take them out daily and clean them thoroughly and brush your teeth and/or gums thoroughly.
4. Use a dentist administered cleansing mouth rinse “Breath RX” which contains “Zytex” that neutralizes the sulfur compounds and kills the bacteria that contributes to bad breath.
5. Make sure to drink at least eight cups of fluoridated water every day.
6. Keep a log of food you eat to determine which foods are causing your problem.
7. Schedule regular dental checkups with professional cleanings.
8. Keep your mouth moist.
9. Use humidifiers during the hot season.
10. Use a moisturizing nasal spray to control post-nasal drip, which can be a contributing factor.
11. Tobacco causes bad breath, ask your dentist/doctor for tips to kick the habit.

ORTHODONTIC PROBLEMS -Braces

1. If a wire is causing an irritation, cover the end of the wire with some wax or a piece of gauze.
2. If a wire becomes embedded in the gum or cheek DO NOT remove it, go to the dentist immediately.



CROWN COMES OFF

1. Try to snap it back in.
2. Purchase a small tube of denture adhesive paste put a small amount in the crown and place it back on your tooth.
3. Try Dent Temp or Tempenol as a temporary adhesive.
4. Do NOT use ordinary household glue.
5. Call the dentist as soon as possible to recement it properly.

DENTAL INJURIES CAN BE PREVENTED:

1. Child proof your home.
2. Make sure your children are belted safely in their stroller and car seat. Wear helmets while biking, skateboarding & roller blading.
3. The whole family uses seat belts.
4. Wear a custom made mouth guard while in “school” sports and during weekend sports and activities.
5. If you are away from home, be sure to carry your doctor’s business card. So if you have a problem you can call for a telephone consultation so he can help you decide whether you need to seek immediate dental care.

BROKEN DENTURE, BRIDGE, OR PLATE

1. Save all the parts of your broken denture, bridge or partial.
2. Call your dentist.
3. If it is possible it may be repaired or it may need to be replaced as soon as possible.
4. Temporary bridges, plates and dentures can keep you comfortable until the permanent one is repaired or replaced.



DRY MOUTH

1. Many medications such as antidepressants can cause this. Consult with your doctor to see if there are alternative medications that will not cause this symptom.
2. Put water in a spray bottle to keep your mouth moist. Try a little Lemon juice in the water to stimulate your saliva glands.
3. Chew sugarless gum to keep your mouth moist.
4. Use a moisturizing gel.
5. Use a saliva substitute such as glandosane.
6. Have custom-made fluoride trays made by your dentist for home application of fluoride. Also use a fluoride mouth rinse.

BLEEDING AFTER AN EXTRACTION

1. Slight bleeding after an extraction is normal. Clots usually form within one hour if you follow doctor's post-op instructions.
2. Place a thick gauze pad over the extraction site and apply pressure by biting on the gauze.
3. Avoid rinsing, drinking or eating for at least one hour following the extraction.
4. After 24 hours rinse the area with warm salt water (1/2 tsp. salt in 8 oz of water) after eating to keep the site clean.
5. Wet a tea bag and place it on the extraction site and bite on it.
6. Avoid sucking, spitting, and smoking.

PAIN AFTER 36 HOURS AFTER AN EXTRACTION

1. Contact your dentist you could have a "dry socket" or infection.

NUMBNESS CONTINUES AFTER EXTRACTION

1. If a tooth has been extracted on the lower back area, it is possible that you may not regain full sensory feelings immediately.
2. After 24 hours contact your dentist to let him know your symptoms.



STILL UNHEALED EXTRACTION SITE

1. If you are still unhealed one week after an extraction you need to go to the dentist for an X-ray to see if a root tip or fragment is still embedded.
2. Do NOT wait to see your dentist.

BROKEN/ FRACTURED /CHIPPED TOOTH OR FILLING

1. If the tooth is broken/chipped/fractured and there is no other damage requiring hospital care go to the dentist within 2-3 hours. Quick action can save the tooth, prevent infection and reduce the need for extensive dental treatment. The dentist can smooth minor chips. The tooth may also need to be restored with a composite filling.
2. Stop any bleeding by applying direct gentle pressure to the gums. If an upper tooth, apply pressure to the gums above the tooth. If a lower tooth, apply pressure to the gums below the tooth. Do NOT press directly on the broken tooth.
3. Rinse the mouth with warm water and apply cold compresses to reduce swelling.
4. Find the broken tooth fragments and bring the pieces with you, they may be able to be “cemented” back together.
5. To avoid further aggravation from the damaged tooth, place a piece of soft wax into the area that was chipped.
6. Eat only soft foods. Avoid this side of your mouth when eating. Avoid food and drink that are hot or cold, eat only lukewarm.
7. Do not take aspirin or aspirin-substitutes that can slow clotting. The more the tooth is bothering you before you go to the dentist the more difficult it is for the dentist to treat you comfortably.
8. If the pulp is damaged it can mean a root canal.
9. This tooth may need a full permanent crown to protect it from further breakage and tooth loss.

INJURY TO THE SOFT TISSUE INSIDE THE MOUTH

1. These include tear, puncture wounds or lacerations to the cheek, lips or tongue.
2. Clean the area right away with warm salt water.
3. Bleeding from the tongue can be reduced by pulling the tongue forward and using gauze to place pressure on the wound area.
4. Go to the doctor/hospital if it needs stitches.



SORE GUMS

1. Purchase Peroxyl to rinse with
2. Brush your teeth and gums CAREFULLY
3. Call the dentist for an evaluation

SORE AFTER SCALING AND ROOT PLANNING

1. Follow after care instructions
2. Use fluoride rinse
3. Try eating soft food
4. Continue to gently brush and clean the area well

GUM SURGERY

1. After the time determined by your dentist rinse with warm salt water (1/2 tsp. salt in 8 oz of water) to help with the discomfort.
2. Try taking extract vitamin C to help quicken the healing period
3. SMOKING WILL DELAY ALL HEALING

FRACTURED JAW

1. If your jaw hurts when it is moved or you cannot close your mouth in a normal manner, immobilize the jaw with a towel or tie.
2. Go to the doctor/hospital. A blow to the head can be especially life threatening to a child. They can give you treatment and tell you if you need to see the dentist

SWOLLEN JAW

1. Place a cold compress to the area swollen
2. Call the dentist immediately as you may have an infection and need to be on antibiotics

SMALL BLACK LESION

1. This could be an “amalgam tattoo” where some of the silver from an Amalgam filling has rubbed onto the cheek
2. Gently clean the area with brushing and rinsing Up To Top

SMALL WHITE LESION

1. Check with your dentist about this lesion because it could be pre-cancerous



4.13 FIRST AID IN FOOD POISONING

Self-Care at Home

Short episodes of vomiting and small amounts of diarrhea lasting less than 24 hours can usually be cared for at home.

- A) Do not eat solid food while nauseous or vomiting but drink plenty of fluids.
- Small, frequent sips of clear liquids (those you can see through) are the best way to stay hydrated.
 - Avoid alcoholic, caffeinated, or sugary drinks, if possible. Over-the-counter rehydration products made for children such as pedialyte and rehydralyte are expensive but good to use if available.
 - Sports drinks such as Gatorade and PowerAde are fine for adults if they are diluted with water because at full strength they contain too much sugar, which can worsen diarrhea.
- B) After successfully tolerating fluids, eating should begin slowly, when nausea and vomiting have stopped. Plain foods that are easy on the stomach should be started in small amount. Consider eating rice, wheat, breads, potatoes, cereals (low-sugar cereals), lean meats, and chicken (not fried) to start. Milk can be given safely, although some people may experience additional stomach upset due to lactose intolerance.
- C) Most food poisoning do not require the use of over-the-counter medication to stop diarrhea, but they are generally safe if used as directed. It is not recommended that these medications be given to children. If there is a question or concern, you should always check with your doctor.

Medical Treatment

The main treatment for food poisoning is putting fluids back in the body (the process of rehydration) through an intravenous line or by drinking. May need to be admitted to the hospital. This depends on the dehydration, your response to therapy, and your ability to drink fluids without vomiting. Children, in particular, may need close observation.

- Antivomiting and Anti diarrhea medication may be given.
- The doctor may also treat any fever to make you more comfortable.



- Antibiotics are rarely needed for food poisoning. In some cases, antibiotics would worsen the condition. Only a few specific causes of food poisoning are improved by using these medications. The length of illness with traveler's diarrhea (shigellae) can be decreased with antibiotics, but this specific illness usually runs its course and improves with treatment.
- With mushroom poisoning or eating food contaminated with pesticides, aggressive treatment may include pumping the stomach (lavage) or giving medication as antidotes. Such poisoning is very serious and may require intensive care in the hospital.

Food Poisoning and Safe Food Handling- Home Treatment

Most cases of food poisoning will go away in a few days rest and care at home. The following information will help you recover.

Prevent Dehydration

Dehydration is the most frequent complication of food poisoning. Older persons and children should take special precautions to prevent it.

To prevent dehydration, take frequent sips of a rehydration drink (such as Lytren, Pedialyte, or Rehydralyte). Try to drink a cup of water or rehydration drink for each large, loose stool you have. Sports drink, soda pop, and fruit juices contain too much sugar and not enough of the important electrolytes that are lost during diarrhea and should only be taken alternately with a rehydration drink. You can make your own rehydration drink.

Try to stick to your normal diet as much as possible. Eating your usual diet will help you get enough nutrition. Doctors believe that eating a normal diet will also help you feel better faster. But try to avoid foods that are high in fat and sugar. Also avoid spicy food and coffee for 2 days after all symptoms have disappeared.

Take extra precaution to prevent dehydration in children

- Symptoms of mild dehydration in your child can include being irritable, agitated, fussy, or restless and urinating less frequently than usual.
- Symptoms of moderate dehydration can include a decreased interest in play, sunken eyes with few tears, and urinating fewer than 3 times in 24 hours.
- Symptom of severe dehydration can include a lack of interest in playing, extreme sleepiness, a dry mouth and tongue, fast breathing, a rapid



heartbeat, and not urinating for more than 12 hours. Severe dehydration is a medical emergency. (CALL emergency services immediately.) For children who are breast-feeding or bottle-feeding, continue the regular breast milk or formula feeding as much as possible. You may have to feed at more frequent intervals to replace lost fluids. Give an oral rehydration solution (ORS), such as pedialyte, between feeding only if you see signs of dehydration

For older children, give ½ cup [4fl oz] to 1 cup [8fl oz] of water, milk, or a rehydration drink each hour, and try to keep feeding your child his or her usual diet. Try to include potatoes, chicken breast without the skin, cereal, yogurt, and fresh fruit and vegetable. Try to avoid foods that have a lot of fat or sugar. Supplement feeding with small sips or spoonful of a rehydration drink or clear liquid every few minutes.

Antidiarrheal Medicines

Medicines that stop diarrhea can reduce the severity and length of symptoms of diarrhea. Using them may help. Antidiarrheal medicines should not be used if you have a fever or bloody diarrhea because they can actually make you more sick. Do not give antidiarrheals to children.

Prevention Tips

Proper Storage

- Keep products in their original container. Don't put chemical in containers that are used for eating and drinking.
- Never store food with cleaning products, pesticides or medicines.
- Use child lock on cabinets
- (In the garage and basement, too).
- Put poisons (toxic products, cleaning supplies, pesticides, medicine) in a locked cabinet –out of your child's sight and reach.
- Properly and quickly dispose off products from do-it-yourself projects including paint removers, gasoline and antifreeze.
- Put poisons away after using them. If you are using a household product when the phone/door rings, take the product with you.
- Don't leave your child alone in a room with cleaning products.



Medicines

- Keep medicines out of the medicine cabinet. Put them in a locked box and place box on a high shelf.
- Ask for and use medicines/household products with child resistant caps.
- Always read the label before giving medicine or using chemical. Check with caregivers to avoid double dose and always measure the dose-don't guess.
- Never call medicine or vitamins candy.
- Never take medicine in front of children. They like to imitate.
- Keep all purse and diaper bags out your child's reach. They may contain medicine or other items that could harm a child.

Plants

- Know the names of all the plants in your house and yard. Keep indoor plants out of reach of children and watch children playing outdoors safely.
- Keep the poison control center phone number on or near your telephone.

Carbon monoxide

- Install carbon monoxide detectors with audible alarms – install one near the sleeping area. For added protection install a second at least 15 feet from a furnace.
- Have a professional check all venting systems annually for proper safety.
- Have your combustion appliance (stoves, heaters) checked.
- Never leave a car running in an enclosed area such as the garage.



4.14 TRANSPORTATION OF THE CASUALTY

GENERAL PRINCIPLES

The method of transport depends on :-

- The nature and severity of injury.
- The number of helpers.
- Facilities available.
- The casualty's build.
- Distance to be covered.
- Route to be traveled.
- Never attempt to move a seriously injured casualty on your own if help is available.
- If the casualty is to be removed to the hospital arrange for an ambulance.
- Wherever possible, the position in which the casualty is found or has been placed should not be changed and the general condition watched carefully throughout.

Aim of Transport

To enable the casualty to reach the destination without deterioration or discomfort.

Lifting Casualty

- If lifting is done correctly even a very heavy casualty can be lifted without undue strain.
- Two principles of lifting:
 - a. You should always use the most powerful muscles of your body.
 - b. The weight should be kept as close to your body as possible.
- Follow correct posture for lifting
- Keep your back straight and head erect and hold the casualty close to your body using your shoulders to support the weight. Use your whole hand to strengthen the grasp. If the casualty begins to slip, do not injure your own back by trying to prevent the casualty from falling. Let the casualty slide slowly and gently to the ground without causing more damage to the injured area.
- When lifting, it is important to keep your back straight and knees bent.



Wheel Chair:

Wheel chair bound casualties can be transported where they sit by adapting the chair method.

Make the casualty sit the casualty well back in the chair.

Examine the wheelchair to find out which parts are fixed – arm rests and side supports are often removable. And will detach. Hold the chair by fixed parts.

Stretchers

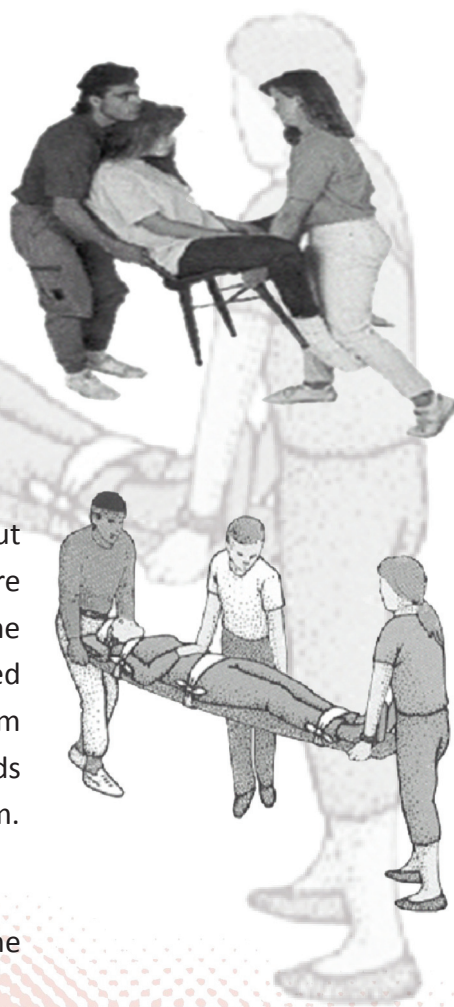
These are used to carry a seriously ill or injured casualty to an ambulance or similar shelter to minimize the risk of further injury. There are a variety of stretchers in general use such as; the standard stretcher; the pole-and-canvas stretcher, the scoop stretcher; the carrying sheet; the carrying chair; the trolley bed; the nail Roberson stretcher; and the par guard stretcher.

Most stretchers can be used to transport casualties with any injury and should be rigid enough to carry casualties with suspected spine fracture without additional boards. All equipment must be tested before it is used. canvas can be folded and sliding under the casualty where the casualty lies. The poles are passed through sleeves down the side of the canvas to form the stretcher. Spacer bars may be placed over the ends of the poles to keep them apart and the stretcher firm.

Manual Lifts

If a blanket is not available you will have to lift the casualty using one of the following methods:

For four Bearers: Three bearers should place themselves on the left of the casualty: one facing the knees, one facing the hips and the third facing the shoulders. The bearers in charge of the casualty should be on the casualty's right facing the middle bearers.



All bearers should go down on their left knees and place their forearms beneath the casualty paying particular attention to the site of the injury. The person in charge should grasp the left wrist of the bearers at the shoulders with the left hand and the right wrist of the bearer opposite with the right hand. The person at the shoulders should support the head and shoulders and ensure an open airway and the fourth bearer should support the lower limbs.

When the order “lift” is given by the person in charge raise the casualty gently, slowly and evenly and place on the knees of the other three bearers.

If a fifth person is not available to move the stretcher, the person in charge should disengage, get the prepared stretcher and place it under the casualty. It should be positioned so that the casualty’s head will be just clear of the top traverse when lowered on to it. The bearer should then resume the original position and rejoin hands.

When the order “lower” is given, work together and gently raise the casualty slightly from the bearers’ knees. Then slowly and evenly lower the casualty on the stretcher bed.

For three bearers : place the stretcher in line with the casualty as near the head as possible. One bearer should kneel on one knee on the injured side of the casualty level with the knees and place the hands under the casualty legs . the other two should kneel on opposite sides of the casualty’s chest and grasp each other’s wrists under the shoulders hips.

Once the order “lift” is given, gently and evenly raise the casualty and stand up. Then, moving with side paces, carry the casualty head first over the stretcher.

When the order “lower” is given, gently, slowly and evenly lower the casualty onto the stretcher.

Loading an Ambulance

A few ambulances have flat built-in beds with grooves to take the runners of a standard stretcher. Four people will be required to load this ambulance: one to stand inside the ambulance ready to guide the stretcher, while the other three stand, one on either side of the stretcher and one at the end ready to lift. If there are two berths, Always load the left one first.

While loading a trolley bed into an ambulance, two bearers should take up their positions one at each end of the trolley bed.

Working together, raise the trolley bed to the required height and carry head first into the ambulance.



Unloading from an Ambulance

Two bearers take hold of the handles of the stretcher at the rear and gently withdraw the stretcher. As it is withdrawn, two more bearers may take hold of the handles at the head and, taking the weight, lower it so that their arms are fully extended. Then, moving with side paces, bring the stretcher out of the ambulance





4.14.1 TRANSPORT OF THE SICK AND INJURED

GENERAL PRINCIPLES

Rescue

In accidents the victim may be trapped in wreckage or debris. In such cases the first aider must decide whether or not the patient should be removed before first aid is given. This will depend upon the need to give life-saving attention. In many cases it will be less disturbing to the patient if he is left until rescue services with adequate equipment arrive. At all times it is the comfort and welfare of the patient which must be considered. Anything which might worsen injuries or increase shock must be avoided. Transport of the sick and injured is an important branch of first aid; much may depend on the careful manner in which a patient is removed to shelter after an accident. The two methods of transport are manual or by stretcher.



Manual methods

These include all methods of carrying a patient by hand. They are suitable for moving a patient for a short distance, e.g. off a football field. Their great advantage is that they can be undertaken by one or two helpers. Except in an emergency, they should not be used for patients who have been seriously injured.

Manual methods can be divided into two categories:

1. Support by a single helper.
 - (a) The cradle carry
 - (b) The human crutch
 - (c) The pick-a-back
 - (d) The drag carry
 - (e) Fireman's lift and carry.
2. Support by two helpers.
 - (a) The two-hand seat
 - (b) The human stretcher
 - (c) Three hands seat
 - (d) The four-hand seat
 - (e) The fore-and-aft carry.

Stretcher methods

These include stretcher-bearing and the use of ambulances. They are more satisfactory than manual methods and should be used for all serious cases such as shock, hemorrhage, and fractures of the spine, pelvis and lower limbs.

Four helpers are necessary for stretcher-bearing if the journey is a long one; shorter journeys can be undertaken by two bearers. Whenever possible, however, long journeys should be avoided. Hence it is often wise, if the case is serious, to remove the patient on a stretcher to a temporary shelter where he can await the arrival of the ambulance, thus avoiding a long journey by stretcher.



Rules for transport

Whichever method of transport is adopted, it must fulfill the following conditions :

Safety. It hardly seems necessary to mention that transport must be safe. However, cases have occurred in which patients have fallen off a stretcher or the stretcher itself has become unserviceable and collapsed. Stretchers should be inspected periodically.

Steadiness. Transport must be steady and great care must be taken to avoid jolting or jarring the patient.

Speed. The patient must be removed as quickly as possible provided that safety and steadiness are preserved. Sometimes, for example, it is necessary to drive an ambulance slowly and to sacrifice speed to provide comfort and safety.

Observation. The patient must be kept under continuous observation throughout the removal. Dressings must be examined to see that they remain securely fixed and that there is no recurrence of bleeding. Constrictive bandages must be readjusted at intervals and the patient should be watched carefully to make certain that there is no change for the worse in his condition.

(1) Support By A Single Helper

(a) The cradle carry

This is valuable for carrying children and patients who are light; it cannot be used for those who are heavy.

Method. The first aider stoops by the side of the patient, places one arm under his knees and the other well round his back, rises (using the power of his legs) and carries the patient.

(b) The human crutch

This can be used for a patient who is suffering from a slight injury to one leg only e.g. a sprained ankle. The patient must be able to help by placing light weight on the injured foot and by supporting himself against the first aider's body.



Method

1. The first aider stands on the injured side of his patient, places his arm round the waist, and grasps some of the clothing on the sound side of the patient's body near his hip.
2. He instructs the patient :
 - (a) to place his arm round his neck so that his hand can be supported;
 - (B) to march out of step with the first aider, beginning with the injured foot; and
 - (c) to throw his weight onto the first aider as the patient takes each step his injured foot.
3. Using his free hand, the first aider grasps and supports that of the patient.
4. The patient tends to fall away from the first aider as they walk; to prevent this the first aider should pull the patient slightly towards him each time the sound foot is on the ground.

(c) **Pick-a-back**

This well-known method can be used if the patient is conscious and able to support himself on the first aider's back. When carrying by the pick-a-back method, always try to clasp your hands. This will assist you when carrying the patient.

(d) **The Drag Carry**

This is used to remove an unconscious patient for a short distance. E.g. away from machinery or from a burning room. The patient should be turned onto his back; the first aider stoops behind his head, facing his feet, places his hands under patient's armpits and walks backwards.

To drag a patient down a staircase, the first aider should crawl backwards down the stairs, supporting the patient's head upon his chest. When time permits, the patient's hands should be tied together on the front of his chest before dragging is begun.



Method

1. The patient should be placed on his back and his wrists tied together.
2. The first aider kneels astride his patient and threads his neck through the loop made by the tied wrists.
3. By crawling forwards on his hands and knees, the first aider can drag his patient to safety.

(e) The fireman's lift and carry

This is a useful method of carrying a patient who is unable to walk, but must only be used when the patient is not too heavy for the first aider. It has the advantage of leaving the first aider one hand free .

Method. The first aider lifts the patient into the upright position and grasps the patient's right wrist with his left hand; then, bending down with his head under the patient's extended right arm, places his right arm round or between the patient's legs. Taking the weight on his right shoulder he rises to the erect position and pulls the patient across both shoulders, transferring the patient's right wrist to his right hand, so leaving the first aider's left hand free.

(2) Support By Two Helpers

These methods consist chiefly of the hand-seats which are used to carry patients when a stretcher is not obtainable. By these methods a patient can be carried for a short distance efficiently, but it is difficult to maintain steady transport.

In all two-helper methods (except the fore-and aft carry) the helpers must walk out of step, beginning with their feet which are furthest away from the patient. They should keep their knees slightly bent to avoid jolting the patient and march with cross-over and not short side-steps.

(a) The two-hand seat

This is used to carry a patient who is unable to use his arms. He must, however, be conscious and be able to keep his body erect.



Method

1. The patient should be placed in the sitting position.
2. The two helpers stoop, facing each other, one on either side of the patient's body. They must not kneel, because they would have difficulty in rising again.
3. Each helper now places his arm which is nearest to the patient's head across his back and grasps some of the clothing on the opposite side of the patient's body. Thus the helpers have crossed arms behind the patient's back.
4. The helpers raise the patient slightly with their crossed arms, and then pass their free forearms under the middle of his thighs, where they clasp hands by a special method called the hook grip. which is made as follows:

The helper on the left side of the patient keeps his palm upwards and holds a folded handkerchief in his hand to prevent discomfort caused by the fingernails of his colleague.

The helper on the right grasps his colleague's hand, keeping his palm downwards.

5. Both helpers rise together, raising the patient between them.

(b) The human stretcher

This is a very valuable method of carrying a patient in the lying-down position, and can be used for unconscious cases.

Method

1. The helpers face each other , one on either side of the patient, and stoop beside him.
2. Each helper places his left hand under the patient's hips and clasps that of his colleague, by the hook grip mentioned above.



3. The helper with a free hand near the patient's head places his arm under the head, neck and shoulders, which must be carefully supported.
4. The helper with a free hand near the feet places his wrist and hand under the calves.
5. The helpers rise and carry the patient.

(c) Three-hand seat

This is used to carry a patient who is able to assist by using his arms. It is designed to supply support for one or both of the lower limbs during transport.

Method

1. The patient should be placed in the sitting position.
2. The helpers stoop, facing each other, one on each side of the patient.
3. The patient is told to place his arms round the helpers' necks and to raise himself slightly from the ground so that a seat can be formed under him.
4. The helper on the injured side places his hand which corresponds to that of the injury under the calf or thigh of the affected limb. Hence he has one hand free to make a seat for the patient.
5. A suitable seat is formed under the patient as follows :The helper who has one arm free interlocks his hand with that of his colleague by clasping his free wrist and allowing his own to be grasped.
6. Both helpers rise together, keeping the injured limb well supported.

(d) Four-hand seat

This can be used when the patient is able to assist by using one or both of his arms and does not require support for either of his lower limbs.



Method

1. The patient should be in the sitting position.
2. The helpers stoop, facing each other, on opposite sides of, and slightly behind, the patient's body.
3. The patient is instructed to place his arms round the necks of the helpers and raise himself slightly from the ground.
4. A seat is formed under the patient as follows :

Each helper grasps his left wrist with his own right hand, keeping the colleague's right wrist with his left hand.
5. The helpers rise together, lifting the patient.

(e) Fore-and-aft method

This must be undertaken when space does not permit the use of ordinary hand seats. It is invaluable for removing a patient through a door or along a narrow corridor, but otherwise the method is not satisfactory, because it is uncomfortable and may cause difficulty in breathing

Method

1. The first helper stoops behind the patient's back and passes his hands under the armpits, clasping his hands together at the front of the chest.
2. The second helper places himself in front of and between the patient's legs with his back to the patient. He stoops and grasps the legs above the knees so that the legs are on either side of his body.

If the patient is a woman, or when both legs have been injured, the limbs can be tied together and carried under the arm.
3. Both helpers rise together and walk in ordinary steps.

