
UNIT 1 FIRST AID IN EMERGENCIES

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1.0 OBJECTIVES

After **studying** this unit, you should **be able** to:

- explain meaning of **first aid** and emergencies;
- describe the objectives and principles of first aid;
explain the life saving **techniques** commonly **used** during **emergencies**; and
provide first aid in **certain** emergencies which arise in community.

1.1 INTRODUCTION

In Block 1 you have learnt about concepts and **principles of** community and family health. While working with family or in community, you may come across many emergency situations. An emergency is the unforeseen medical condition which calls for prompt and quick action to save the life of a person or to prevent severe damage. If you happen to be at the site when an emergency arises you may have to deal with it promptly with knowledge, skill and **confidence**. The main aim of providing prompt and proper first aid treatment in any emergency situation is to save life, provide relief from immediate danger and prevent further injury or impairment.

In this unit you will learn about **providing first aid** in certain common conditions which may occur accidentally in the family or in community. Let us begin with definition, meaning and principles of first aid.

1.2 CONCEPTS AND PRINCIPLES OF FIRST AID AND EMERGENCY

As a health worker you should understand what are the principles and objectives of first aid and what do you mean by first aid? All these are described in the following subsections.

1.2.1 Meaning of First Aid

First aid is an immediate temporary assistance given to a person who is injured or has suddenly become ill (using facilities or materials available), at the site before regular medical help is made available.

First aid includes assessing the victim for life threatening conditions, performing appropriate interventions to sustain life and keeping the person in the best possible physical and mental state until **he/she** is brought to the emergency or casualty unit in the hospital to save life and prevent further injury or damage.

1.2.2 Objectives of First Aid

The objectives of the first aid are to:

- preserve life.
- prevent further injury and deterioration of the condition.
- prevent complications related to injury or illness.
- make the victim as comfortable as possible to conserve strength.
- a help the injured person to be able to reach for professional **medical** aid at the earliest.

1.2.3 Principles of First Aid

When you come across a seriously injured person **you** should follow the below mentioned principles **i.e.** :

- a Make sure that victim's airway is not blocked by the tongue, secretions or some foreign body.
- Make sure that the person is breathing, if not administer artificial respiration — restore respiration.
- Make sure that patient has a pulse if no pulse is felt, **administer** cardio pulmonary resuscitation (CPR). (This is discussed in Section 1.3.)
- Check for bleeding – take measures to control **and** stop bleeding.
- Act fast if the victim is bleeding severely or he has swallowed poison **or** his heart beat or breathing has stopped "**Every second is important**".
- Arrange without delay for shifting the victim to hospital for medical attention. Although most injured persons can safely be moved, it is **important** not to **move** a person with serious neck or back injuries unless you save him from further danger.
- Keep the **victim/patient** lying down. If he has vomited and there is no danger of his neck being broken – turn him on his side to prevent choking. Keep him **warm** with blankets or coats.

- Have someone to call for medical assistance while you giving first aid. The person who summons help should explain the nature of the emergency and ask what should be done pending the arrival of the ambulance.
- Examine the victim gently, cut clothing, if necessary to avoid abrupt movements which adds pain. Don't pull clothing away from burns unless it is smoldering.
- Reassure the victim, try to remain calm yourself. Your calmness can allay his fear and panic.
- Do not give fluids to an unconscious or semi conscious victim.
- Do not try to arouse an unconscious person by slapping or shaking.
- Look for an emergency identification card for medical information related to victim, for example diabetes, epilepsy or heart diseases.

Check Your Progress I

i) List three main objectives of first aid.

- a)
- b)
- c)

ii) List three main principles of first aid.

- a)
- b)
- c)

1.3 CARDIO-PULMONARY RESUSCITATION

1.3.1 Definition and Indications

Cardio-pulmonary resuscitation (CPR) is defined as technique of basic life support for the purpose of oxygenating the brain and heart until appropriate definite medical treatment is made available to restore ventilation and pumping action of heart.

Indications

The CPR is indicated in the following situations:

- Cardiac arrest: It is a condition when heart suddenly stops effective beating
- Respiratory arrest: It is a condition when breathing stops
- Cardio-pulmonary arrest: It is a condition which includes i) and ii) both.

1.3.2 Signs and Assessment of CPR

The signs of CPR will include:

- Immediate loss of consciousness
- Cessation of perceptible respiration and arrest after 45 seconds
- Absence of carotid pulse
- Dilation of pupils

Consciousness	Shake the shoulders of the victim and ask him/her to tell his/her name.
Breathing	Look for chest movements. Feel for breath for 5 seconds by placing the ear above the casualty's mouth and look along the chest and abdomen to see any movement. If the casualty has stopped breathing you will not see any movement.
Pulse	Place three fingers on the Adam's apple and gently move to left or right side of trachea to feel for carotid pulse in the hollow between the voice box and adjoining muscle. Count pulse for five seconds.

Parameters of Assessment	Assessment	Methods of Assessment
Pupils		Move the eyelids of left eye away to look for the size of pupils whether small in size (constricted) or large in size (dilated). Repeat this on the right eye.

1.3.3 ABC of CPR

When the victim appears unconscious, or lifeless, the ABC of resuscitation needs to be performed in order to assess his/her most urgent needs. Assessment should be done as quickly as possible. Now let us understand what do we mean by ABC:

A = Airway clearance

B = Breathing maintenance

C = Circulation maintenance

- Therefore, opening an airway will allow passage of fresh air to the lungs.
- Breathing will give artificial ventilation by transferring air from your own lungs into casualty's (mouth to mouth ventilation)
- External chest compressions (by applying pressure on the chest) will compress heart and pump the blood to vital organs and thereby maintain circulation.

1.3.4 Techniques of CPR

Now let us see what steps are needed for performing CPR technique.

CPR is a life saving technique to be performed with skill and practice. When you come across a victim with cardio-pulmonary arrest, you are expected to do quick assessment because of the critical time factor. The quicker you start CPR the better are the victim's chances for survival.

Now let us see what steps are needed for performing CPR technique as per ABC of CPR.

- Gently place the victim on his/her back. Make sure that there is no injury to the neck because mishandling may cause further damage.
- Loosen the necktie, clothes around neck, chest and abdomen.

1) A—Airway Clearance

In order to clear the airway following steps are necessary to be performed in an orderly manner. Follow three major steps as given below:

- i) Check breathing
- ii) Open the airway
- iii) Clear the airway

Now let us narrow down the steps under each major heading:

- i) Check breathing: Refer to sub-section 1.3.2.
- ii) Open the airway: To clear the airway, you have to remove obstructing substance which could be tongue stepping back, saliva, vomit, loose teeth etc. Therefore, take following steps to open the airway:
 - Hyperextend the neck to open the airway by placing one hand under the nape of the neck and the other hand on forehead and tilt the head back.
 - Lift the chin gently without closing mouth.
 - Check if breathing is restored. If yes, place the casualty in recovery position. If not, move to next step.
- iii) Clearing the airway: In an opening airway you will be able to see or feel obstructing substance(s) as mentioned above therefore,
 - Use first two fingers as the hook to dislodge any obstructing substance by sweeping round inside the mouth.

- Check breathing if restored, place the casualty in recovery position or else move on to the next step.

2) B—Breathing Maintenance

You are expected to act quickly and restore breathing by giving mouth-to-mouth ventilation as follows:

- Pinch and compress nose to close nostrils.
- Take deep breath.
- Place your mouth around victim's mouth and make an air tight seal.
- Breathe in four times into the victim's mouth as quickly as possible.

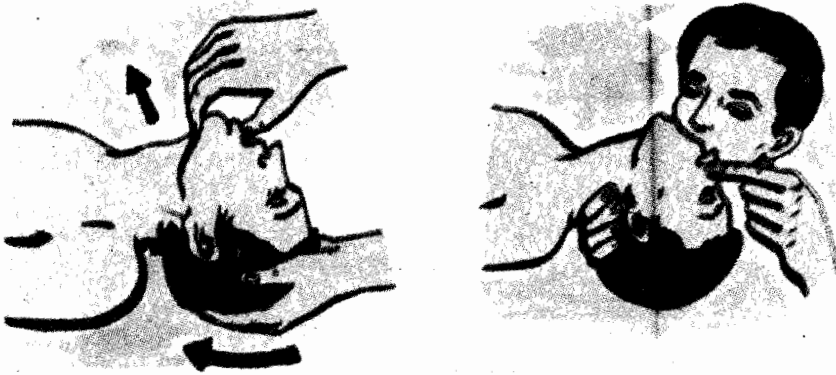


Fig1.1(a,b)

- Watch victim's chest movements for rise and fall of chest and also check for heart beat.
- If breathing is not yet restored, feel the pulse as mentioned above (sub-section 1.3.2) and proceed as follows, i.e. go to step 'C' of ABC (chest compression)

Mouth-to-mouth ventilation must not be used in cases where victim's mouth is contaminated with poison, in facial injuries, where victim's face is pinned-down and in case of recurrent vomiting.

3) C—Circulation Maintenance

Giving compressions on the chest can stimulate heart beat in a non-beating heart. Therefore, providing external chest compressions (ECC) can help restore circulation provided it is done effectively.

Always place the casualty on flat and firm surface while carrying out chest compression and when there is no heart beat.

In order to restore circulation proceed as follows:

- Give a pericardial thump into mid sternum region with closed fist (except in myocardial infarction (MI). This may result in resuscitation of normal heart beat which is indicated by the carotid pulsation. If not, then start ECC as given below:
 - Place the victim on hard surface and kneel at victim's right side at the level of the chest,
 - Locate the xiphoid process,
 - Place heel of one hand at this point on the sternum,
 - Interlock fingers to keep them off the victim's ribs,
 - Keep elbows straight and lean forward,
 - Deliver downward compression by applying steady smooth pressure to depress victim's sternum 1.5 to 2 inches. Make sure not to bend your elbows during compression.
 - Then relax pressure completely but do not let your hands leave the victim's chest or you may lose correct hand position.



Fig.1.1(c)

Repeat and also perform mouth-to-mouth ventilation.

After 5 ECC, followed by two mouth-to-mouth ventilations. To maintain the rhythm count one and two and three and so on till fifteen when you are ready to give

- Continue the procedure and check heart beat after every cycle of ECC. When the heart beat starts, stop ECC and continue mouth-to-mouth ventilations till spontaneous breathing is restored. Assist the casualty if needed till his/her normal rate of breathing and heart beat are established.
- Place the casualty in recovery position.
- If the casualty does not start with spontaneous circulation and breathing, continue CPR till twenty minutes, and then stop.
- In any instances refer the casualty to nearby health centre.

External chest compression should always precede external chest compression. Restart immediately as soon as you feel return of carotid pulse.

Here it is necessary that you also get familiar with the procedure of CPR when you have got an assistant. It is easy and less tiring to do/carry out CPR with an assistant. Given below are the steps of CPR when you have an assistant.

- Firstly decide who will do what and accordingly take the charge. First person takes position at the head end for performing mouth-to-mouth ventilation. Second person kneels along side the casualty's right side at the level of chest.
- The role of first person is to start mouth-to-mouth ventilation as listed in airway clearance and breathing maintenance above.
- The role of second person is to start ECC as listed in circulation maintenance above.
- The ratio of mouth-to-mouth ventilations to ECC will differ. First person will give mouth-to-mouth ventilations and second person will give five ECC. This is performed continuously without pause i.e. after five ECC, the first person will perform his role to maintain a rhythm. Count 1, 2 and so on. The count of ECC and mouth-to-mouth at this rate will give a heart rate of 60 per minute and 12 breaths per minute.
- Check the heartbeat after every cycle of 5 ECC.

1.3.5 CPR for Children

The technique of resuscitation for young and older children is the same as that of adults explained above. The only difference is that CPR is done strictly at a faster rate i.e. 15 ECC to two ventilations to maintain a rate of 100 heartbeats and 20 breaths and with less pressure of 1 to 1.5 inch.

For resuscitation of newborn refer Course 2, Block 3, Unit 1.

Primary resuscitation includes steps 1 and 2.
Chest resuscitation includes step 3.
Complete resuscitation includes steps 1, 2 and 3 as given above.

Check Your Progress 2

- i) List life saving techniques used in first aid.

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- ii) What is ABC rule of assessment?

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1.4 SELECTED EMERGENCY SITUATIONS

Let us first understand what do we mean by emergency.

Emergencies can be defined as all acute crisis (life threatening) situations caused by injuries or other medical problems (illness).

As a health worker you should be able to provide first aid in emergencies at your work place before shifting the casualty to appropriate health facility for further treatment. We shall discuss selected emergency situations in following subsections.

1.4.1 Haemorrhage

Haemorrhage means loss of blood due to internal or external bleeding. This causes decreased oxygen supply to the body especially to vital organs i.e., brain heart and kidneys. Decreased blood volume also causes the hypotension. The heart must pump faster to compensate for the decreased blood volume and blood pressure. Uncontrolled bleeding can result into shock and death. Let us understand the types of haemorrhage.

Types of Haemorrhage

According to the depth of the wound, bleeding may be caused from all the three types of blood vessels, such as arteries, veins and capillaries. Let us briefly describe these three types of bleeding.

Arterial Bleeding: When an artery is severed or punctured the bleeding is characterised by the heavy spurting of bright red blood in the rhythm of heartbeat. The most common arteries that can be affected are femoral, radial, brachial and carotid arteries.

Venous Bleeding: Venous bleeding occurs when a vein is severed or punctured and results in slow flow of dark red blood. It may result in shock and embolism.

Capillary Bleeding: The most common type of external haemorrhage results from damaged or broken capillaries and is characterised by oozing of minor cuts, scratches and abrasions.

First Aid Treatment in Haemorrhage

External Haemorrhage

It is the bleeding which can be seen e.g. bleeding from nose, mouth, open wound. When you come across a person with external bleeding you should follow the measures or actions given below:

- Make the victim lie down to prevent fainting.
- Apply firm pressure and maintain it over the wound with a pad until bleeding is controlled.
- If there is venous bleeding from the limb, apply pressure below the wound.
- If there is arterial bleeding, apply tourniquet above the wound.
- When bleeding is controlled, apply the dressing and firm bandage.
- Treat for shock.
- If bleeding is from upper limb, place the limb in a sling.
- If it is from lower limb, keep the limb raised.
- When bleeding is not controlled or there is arterial bleeding or patient is in shock, you should immediately refer the casualty to health centre or hospital and if possible accompany the casualty to the hospital/health centre.
- Look for any bleeding from the nose (epistaxis) etc.
- Keep the victim quiet in sitting position leaning forward and head erect.
- If the victim is unable to sit up he/she should remain in supine position with head and shoulders raised.
- In case of epistaxis pressure should be applied beneath the nostrils above the upper lip. If bleeding continues, refer to the hospital.

Internal Haemorrhage

It is the bleeding within the body cavities which can not be seen outwardly with no external

evidence. e.g. bleeding from stomach ulcer. It may occur associated with or without injury. Internal bleeding is a life-threatening situation. Common causes for internal bleeding include:

- Fractures.
- Knife and bullet wounds.
- Crushing Injuries.
- Organ Injuries.
- Ruptured Aneurysms.

When you come across the victims with internal bleeding you are expected to make a quick assessment. Observe for shock and the type and pattern of internal bleeding. This includes:

- Signs and symptoms of shock. (Refer sub-section 1.4.2.)
- Hemoptysis (expectoration of blood).
- Malena (Dark, tarry stool – blood in stools)
- Hematuria (blood in urine).

You have to take following measures to control internal bleeding:

- Victim should be placed on flat surface with legs slightly elevated if this is not contraindicated by other injuries.
- Establish an airway and treat shock.
- A cold compress or ice is placed on the area of suspected injury.
- Maintain body temperature with blankets and monitor vital signs.
- The victim should not be given anything to eat or drink.
- Administer oxygen, if available.
- Decrease the victim's fear and anxiety by giving psychological support and reassurance.

Controlling Bleeding from Wounds and Cuts

If there is bleeding from the wound in a leg, take following measures:

- Raise the injured part.
- Press the wound with clean cloth or hand, if there is no cloth.
- Keep pressing until the bleeding stops. This may take 15 minutes or sometimes an hour or more. (Press directly on the wound.)

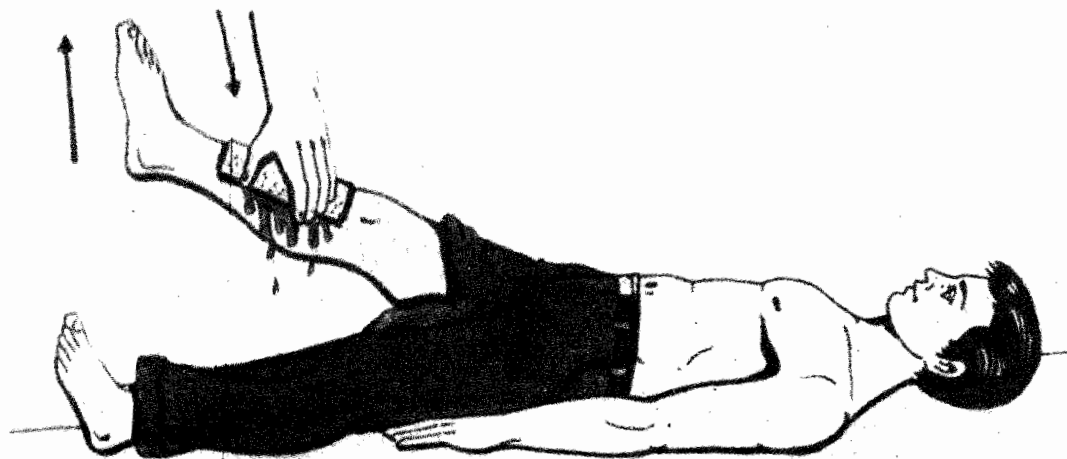


Fig. 1.2

If the bleeding cannot be controlled by pressing on the wound, and if the person is losing a lot of blood, do the following:

- Keep pressing on the wound.
- Raise the wounded part as high as possible.
- Tie the arm or leg as close to the wound as possible—between the wound and the body, tighten enough to control the bleeding.

Do not make it so tight that the arm or leg becomes blue.

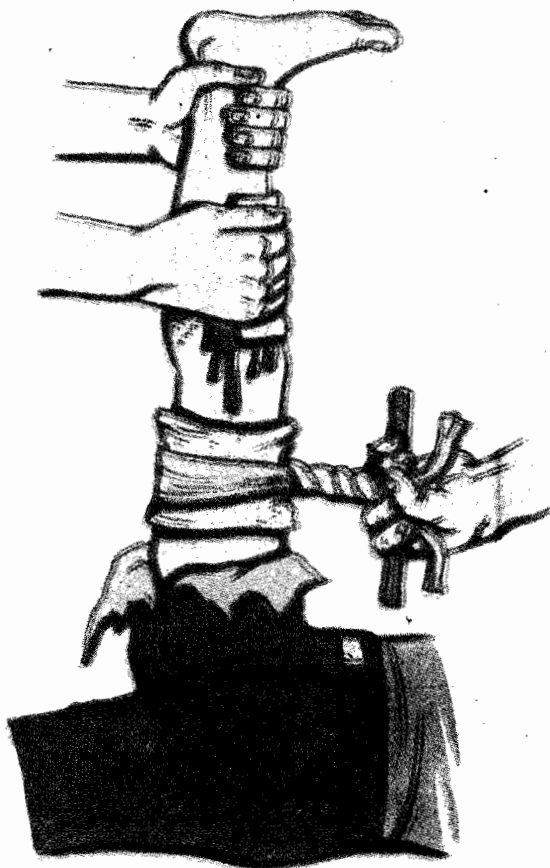


Fig. 1.3

- For tying, use a folded cloth or a wide belt, never use thin rope, string or wire.

Precautions

- Tie the limb only if bleeding is severe and cannot be controlled by pressing directly on the wound.
- Loosen the tie for a moment every half an hour to let the blood circulate. Leaving the tie too long may damage the arm or leg so much that it may have to be cut off.
- If bleeding or injury is severe, raise the feet and lower the head to prevent shock.

Never put animal faeces or mud on a wound. These can cause dangerous infections, such as tetanus. A clean wound will heal without any medicines.

Cleanliness is of first importance in preventing infection and helping wounds to heal.

How to Stop Nose Bleeding

- Make the casualty to sit quietly with the head well forward
- Loosen any tight clothing around the neck and chest.



(a)

Fig. 1.4

(b)

- iii) Advise the casualty to breathe through mouth and pinch soft part of the nose firmly for 10 minutes or until the bleeding has stopped.
- iv) If bleeding does not stop use clean cloth or gauze to lightly pack the nostrils with ends of the cloth/gauze hanging out to facilitate removal. Pinch the nose, with the gauze in it, for another five minutes.
- vi) Teach the victim not to blow or finger the nose for several hours after the bleeding has stopped.
- v) Refer the casualty to nearest health centre.

If there is a foreign body in the nose, do not try to dislodge unless they can be gently blown away.

Cuts, Scrapes and Small Wounds

To treat a wound:

- First, wash your hands very well with soap and water.
- Then wash the wound well with soap and clean plain water.

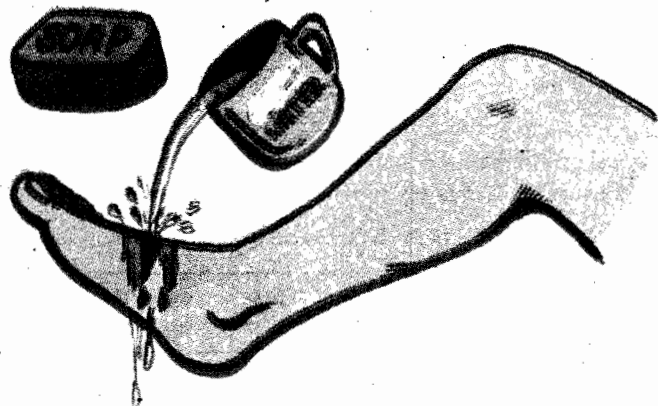


Fig. 1.5(a)

- To clean minor wound it is necessary to encourage a little bleeding with gentle pressure.
- When cleaning the wound, be careful to clean out all the dirt. Lift up and clean under any flaps of skin. You can use a clean tweezers or any other instruments to remove bits of dirt but always boil them first to be sure they are sterile.



Fig. 1.5(b)

- If possible flush out the wound with boiled water and a syringe bulb, and pat the wound dry.



Fig. 1.5(c)

- Any bit of dirt that is left in a wound can cause an infection.

Do not rub the wound as it may start bleeding again.

1.4.2 Shock

Shock results from the failure of the cardiovascular system to provide sufficient blood circulation (oxygen) to all parts of the body.

Causes of Shock

The most common causes of shock are:

- Severe loss of blood
- Intense pain
- Extensive trauma
- Burns
- Poisons
- Emotional stress or intense emotion
- Extreme heat and cold
- Electrical shock
- Allergic reactions
- A sudden or severe illness

Types of Shock

Shock is classified according to causes as given below:

- Hypovolumic Shock:** Also known as haemorrhagic shock, this is caused by decrease in fluid volume from bleeding, prolonged vomiting or diarrhoea, or loss of fluid from surgery or trauma.
- Cardiogenic Shock:** This results from poor heart function caused by various cardiovascular abnormalities. The heart is unable to maintain sufficient blood pressure to all parts of the body.

- iii) **Neurogenic Shock:** It is caused by failure of the nervous system to maintain a normal contraction of blood vessels.
- iv) **Septic Shock:** It results from the severe infection. The micro-organisms cause loss of fluid through the wall of the blood vessel.
- v) **Psychogenic Shock:** It is caused by nervous system reaction to an emotional stimulus. The blood vessels dilate temporarily, decreasing blood flow to the brain which results in unconsciousness or syncope.
- vi) **Anaphylactic Shock:** Anaphylactic shock results from a sudden severe, allergic body reaction to foreign substance such as drugs, bee sting etc.

How can you assess the shock. You have to be alert in assessing and managing shock.

Assessment of Shock

You can assess by:

- **Level of Consciousness:** The victim may experience changes in behaviour restlessness, anxiety, confusion, syncope and agitation. As the condition worsens, the victim becomes more lethargic, unconsciousness and death can result. So you have to assess whether victim is drowsy, confused, lethargic, semiconscious or deeply unconscious.
- **Skin Changes:** The skin becomes cool, pale. As shock progresses cyanosis develops in the lips and nailbuds.
- **Cardio Vascular Changes:** Blood pressure: Initially the blood pressure may be normal, but as shock progresses there is steady decrease in blood pressure.
- **Pulse:** The pulse rate usually increases in all types of shock, but becomes weak and thready in character.
- **Respiration:** Respiratory rate increases, respiration may also be shallow, rapid, laboured or irregular as a result of vasoconstriction of the lungs causing fluid to accumulate within lungs.
- **Urinary Output:** With decreased circulation of fluid volume amount of urinary output is decreased (oliguria).
- **Neuro Muscular Changes:** Decreased oxygen to the tissues results in weakness and / or tremors of the arms and legs. Eyelids close and pupils dilate.
- **Gastrointestinal Changes:** Because of loss of fluid and fluid shift, the victim will complain of thirst, nausea, vomiting and dry mucous membranes.
- The victim should lie flat with the head slightly lower than the rest of the body, unless the victim has sustained head and chest injuries.

First Aid in Shock

- 1) Position the casualty with head turned on one side and foot end raised to 20-30 cm.
- 2) Loosen the clothing around neck, chest and abdomen.
- 3) Keep the casualty warm using blanket or thick sheet.
- 4) Check for pulse, respiratory rate, levels of responsiveness at ten minute interval.
- 5) Do not force fluids, if the victim complains of thirst, moisten lips with water.
- 6) If breathing and heart beat stops start CPR.
- 7) Remove the casualty to nearby health centre.

Check Your Progress 3

- i) Write first aid management of external bleeding.

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- ii) List five causes of shock.

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1.4.3 Wounds

A wound is an abnormal break in the skin or other tissue which allows blood to escape.

A break or tear in the skin may occur following an accident or injury.

The injury to the skin may be caused by:

- A cut with a sharp instruments such as knife, glass, stone etc.
- A blow with blunt instrument such as stick, stone etc.
- A broken bone whose sharp ends pierce the skin from inside.

There are mainly two types of wounds namely open wounds and closed wounds.

- a) **Open wounds:** In open wounds skin is broken which allows blood to escape from the body. Open wound ranges from abrasion to deep wound (punctured). Let us learn about abrasions and deeper punctured wounds.
- **Abrasion** is superficial wound caused by rubbing, scraping in which part of the skin surface has been lost.
 - Abrasion involves the tearing loose of flaps of the skin, which may either remain hanging or be torn off altogether.
 - **Incised wounds** are caused by sharp instruments (knife, blade, razor or broken glass) which tends to bleed freely because the blood vessels and tissues have been severed. In this the edge of the wound are straight and it is usually accompanied by profuse bleeding which helps to wash any germs that might have entered the wound. A deep incised wound may cut through tendon and or arteries.
 - **Lacerated wound:** Laceration is a cut caused by a sharp uneven instrument such as broken glass bottle which produces incision through the skin surface and underlying structures. Laceration may lead to significant bleeding, but any dirt, which may have entered the wound is not thoroughly flushed out and can lead to infection.
 - **Punctured wound:** It is caused by pointed object such as nail, knife, bullet, sword etc. Each object puncturing the body will tear through the skin and proceed in a straight line damaging all the tissue in its path. In this the opening in the skin may appear small but wound can be very deep and causes a serious infections. Internal organs can also be injured by this type of wound and is referred to as penetrating wound or perforating wound. In perforating wound, the wound may be shallow or deep and both internal and external bleeding may occur. Penetrating objects may be nail, thorn or knife.

Perforating wound, with gunshot injury. It has wound of entrance and exit. Entrance wound is always smaller as compared to exit wound. Here the internal organs tissues and blood vessels may be damaged during the bullets which passes through the body. In addition there may be external or internal bleeding.

You have learnt about various types of open wounds, which included abrasions, incised wound, lacerated wounds, punctured and perforated wounds. Now we shall have a look on closed wounds

- c) **Closed wound:** Closed wound allows blood to escape from the circulatory system but not from the body where skin is not broken, for example, contusion or bruises and internal bleeding.
- **In bruises (closed wound),** the soft tissues beneath the skin are damaged but the skin is not broken. They are marked by local pain and swelling of small blood vessels beneath the skin. The victim will also exhibit ecchymosis (black or blue colouring). If large vessels have been torn beneath the bruised area hematoma will develop.

- In internal bleeding the blood is lost from circulatory system but not from the body. Blood collects in one of the body cavities and remains concealed. It may be revealed by a flow of blood from one or more of the various openings such as mouth, nose, ear or rectum.

First Aid Treatment

What should you do when you come across with victims of wounds or injuries. You need to take measures as per types of wounds.

1) *Abrasions*

When you have a patient with abrasions carry on the following measures:

- Wash the site with clean boiled water with soap.
- Remove any grit or other foreign matter.
- Wash with antiseptic lotion and apply mercurochrome.
- Apply clean dressing and bandage.
- Give sulphadamide tablet or any other medicine prescribed in standing order.
- Tell the patient to come again if he gets fever or bleeding increases
- Change the dressing every day till it is dry and clean.
- Give injection tetanus toxoid.

Check Your Progress 4

- i) What is punctured wound?

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- ii) How you manage a person having bleeding from abrasions after fall on road side.

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2) *Other Wounds*

In cases of incised wound, lacerated wound and punctured wound, the appearance of the wound depends on the type of the wound and bleeding present to a varying extent. Signs of shock may be present depending on severity of wound and the amount of bleeding.

When you come across these cases, take following measures:

- Handle the injured part as gently and as little as possible.
- Make the patient to sit or lie down and raise the wounded leg.
- Take measures to stop bleeding.
- Treat for shock.
- If the wound is large apply dressing and refer the patient to PHC or any health care centre. After applying firm bandage to control the bleeding put the arm in a sling or immobilise the leg if necessary.
- All punctured wound of the chest and abdomen after first aid should be referred to the place where proper facilities are available to treat such cases.
- If there is closed wound, observe for symptoms of shock and refer immediately.

1.4.4 Burns and Scalds

Burns are due to dry heat (including friction). Whereas scalds are due to wet heat. Burns and scalds are considered together as they produce the severe type of injury. It is more important that burns and scalds are treated correctly so as to limit the effects of the injury and to prevent possible long term scarring.

Burns are caused by:

- Fire, explosions of pressure stoves, fire due to petrol, hot metals etc.
- Electricity
- Corrosive chemicals e.g. strong acids and strong alkalis.

Scalds are caused by:

- Boiling water, steam, hot oil, cooking etc.

The extent of injury caused by burns and scalds depends on three factors i.e.

- i) The duration of contact between the skin and the substance causing injury.
- ii) The strength of the substance. This is particularly important when chemicals and electric current are the cause of injury.
- iii) Involvement of deep layer of skin or other organs.

Signs and Symptoms

The resulting injuries range from mild to fatal, minor burns simply cause redness and pain to outer layer of skin, but severe burns penetrate more deeply and can damage nerves, blood vessels, glands and even muscle and bone.

In general burns are classified as follows:

First Degree Burns: It causes both pain and redness but not blisters and the damage is confined to the epidermis, (the skin's tough outer layer). There is redness and swelling in the skin. This type of burns and scale are painful. These are called as superficial burns.

Second Degree Burns: It produces blisters and damages both epidermis and the dermis (the inner layers of the skin). These can be quite painful but usually are not serious unless they cover large part of the body or blisters become infected.

Third Degree Burns: These look charred, white or blackened and extend to the tissues below the skin. The skin is burnt away and the damage extends into the muscle and fat layers. There is a pale, waxy look of the burn also with charred areas. Because the nerve endings have been damaged, these types of burns/scalds involve little or no pain.

The severity of burns is determined by the percentage of the body surface covered. To calculate extent of burn, usually you can use the "RULE OF NINE" (Fig. 1.6) which divides the front and back of the body into roughly equal segments, each representing 9% of the total body surface. Exception to the rule is groin which represents 1%.

First aid when there is

i) Burns due to thermal cause or thermal burns

- Stop burning process, extinguish flames.
- Cool burned area immediately with stream of cold water.
- Assess airway, breathing and circulation and initiate basic life support measures (see sub-section 4.3.1 on basic life support techniques).
- Remove clothing and cover burned area with sterile material.
- Treat for shock (as discussed).
- Refer immediately to the hospital.

ii) Acid Burns

- Cool area with stream of plain water.
- Remove acid soaked clothing.
- Soak affected part with alkaline solution (tablespoon of baking soda in 1 litre of water)

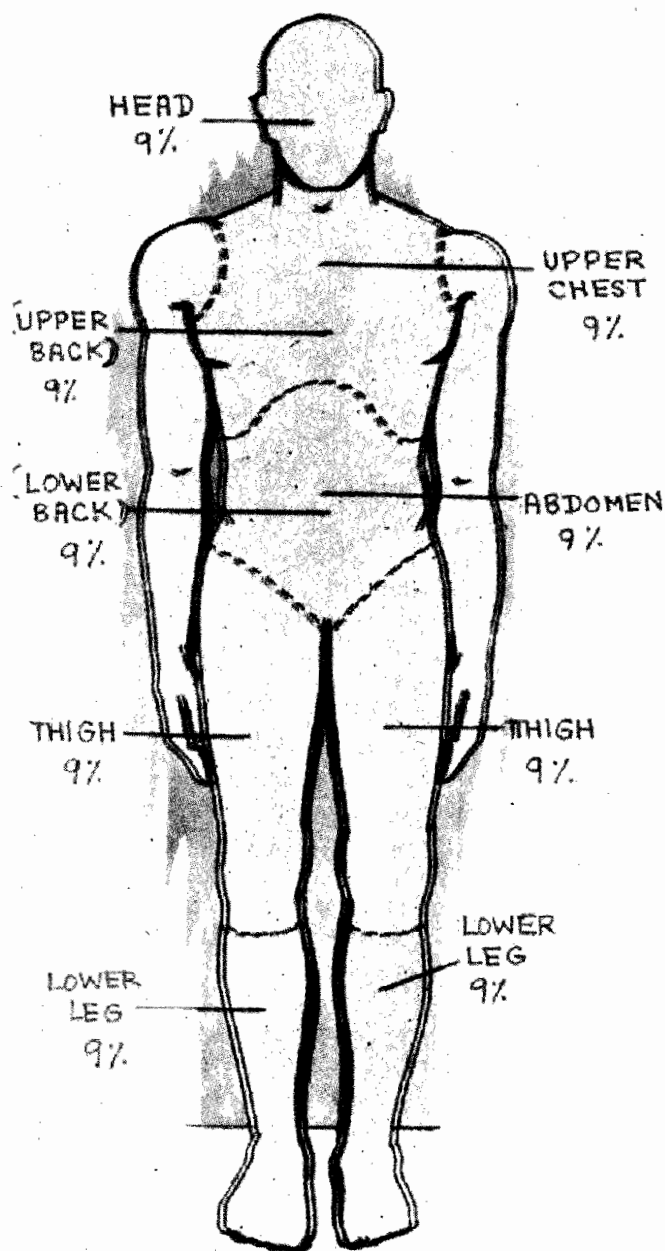


Fig. 1.6: Rule of Nine

- Cover with clean linen or material only if necessary.
- Give analgesics for pain e.g. Asprin, Analgin, Novalgin, Crocin, Paracetamol (one tablet orally three times a day).

iii) **Alkali Burns**

- Flood burnt area with stream of plain water (Fig. 1.7(a)).
- Remove alkali-soaked clothing.
- Wash burned area with weak solution of vinegar and water in equal part.
- Cover with clean linen only if necessary (Fig. 1.7(b)).
- Give analgesics for pain e.g. tablet Asprin one tablet 3 times a day.

First Aid Treatment for Burns in General

- i) For the first and second degree burns immerse the burn part in cool water if possible



Fig. 1.7(a)

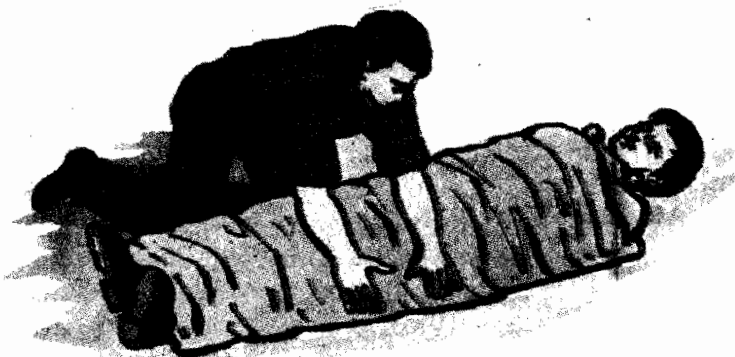


Fig. 1.7(b)

- ii) Apply cold packs to reduce the swelling but do not apply ice directly to the skin. Leave a cold pack for 20 minutes, remove it for 10 minutes and then reapply it.
- iii) Advise the victim to take tablets to reduce pain and inflammation. Do not give aspirin or bruffen empty stomach.
- iv) Allow the blisters to develop. Do not puncture them as this increases the risk of infection.
- v) If blisters open on its own, wash the area gently with soap and water. Apply an antibiotic ointment and cover with sterile bandage.
- vi) Change the dressing at least once a day.
- vii) If there is any sign of infection or inflammation refer to health centre.

First Aid Treatment for Third Degree Burns

The main effects of burns and scalds are shock, pain and sepsis. Your efforts must be directed to deal with these conditions.

- Make the patient to lie down comfortably.
- If possible gently remove any rings, watches or constricting clothing from the injured area before it starts to swell.
- Keep him warm, give hot drinks e.g. strong tea with plenty of sugar.
- Cover the burns area with an antibiotic ointment and sterile dressing and apply bandage.
- Treat shock.
- Transfer the patient to nearest Health care centre and hospital, where facilities are available to treat such cases as early as possible.

- i) List the types of burns.

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- ii) Explain how you will attend to a person who has burns due to boiling milk at home.

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1.4.5 Poisons

A poison is any substance (solid, liquid, gas) that even in small amount causes damage to the body or interferes with the function of its system. Most poisons act rapidly and immediate first aid can prevent further damage.

Signs and Symptoms

Acute signs and symptoms of poisoning will depend upon type of poisoning. Following signs and symptoms may be present:

- Severe nausea, vomiting or diarrhoea.
- Seizures, twitching or paralysis.
- Decreased level of consciousness or unconsciousness
- Restlessness, delirium, agitation or panic.
- Colour changes
- Pale, flushed or cyanotic skin.
- Signs of burns, oedma around mouth or other areas of body.
- Pain on swallowing, tenderness, cramps.
- Slow laboured breathing and wheezing.
- Unusual urine colour (red, green, bright yellow, black)
- Abnormal constriction or dilatation of pupils.
- Skin irritation, erythema or odema.
- Shock or cardiac arrest.

Types of Poison

Poisons may be classified into following four types:

- i) Ingested poison
- ii) Inhaled poison
- iii) Absorbed poison
- iv) Injected poison

Let us know about each of these types briefly.

i) *Ingested Poisons*

Refers to poisoning by mouth which is most common, especially in children and weak minded persons. Common substances include household cleaning products, garden and garbage supplies that is insecticides, gasoline and drugs, medicated food and plants etc.

ii) *Inhaled Poisons*

Inhaled poisons can be present without warning and are absorbed very rapidly. They require prompt first aid measures. Common sources of inhaled poisons include:

- Carbondioxide (from sewers and industry)
- Refrigeration gases.
- Chlorine and fumes from spray.
- Other liquid chemicals and gases of poisonous fumes.

iii) *Absorbed Poisons*

Poisons like caustic chemicals and poisonous plants that come in contact with the skin can be rapidly absorbed causing burning, skin irritation, allergic reaction or severe systemic reactions.

iv) *Injected Poisons*

Injection of drug to which an individual is allergic and the venom from insects, reptiles and animals can cause allergic reaction, that can range from mild to severe even death can occur.

First Aid Treatment

We shall describe the first aid according to the type of poisoning.

i) *Ingested Poison*

- Maintain an airway.
- If victim is an adult and is conscious the poison may be diluted by giving 2 to 4 glasses of water.
- Vomiting should be induced with precautions by giving one table spoon of salt in 6 to 8 ozs of water.
- Do not induce vomiting if the victim has corrosive poisons such as carbolic acid, toilet bowl cleaner, dye, drain cleaner, ammonia or a volatile substance such as kerosene or gasoline.
- Also do not induce vomiting when victim is in sleep or having convulsions.
- Refer such cases immediately for medical help/health centre.
- Treat for shock if present.

ii) *Inhaled Poisoning*

- First assess the danger.
- The victim should be removed from the dangerous area.
- Clothing should be loosened from the victim's throat and chest.
- Airway must be maintained.
- CPR may be given if required (refer Section 1.3 of this unit)
- Victim should be shifted to the nearest medical facility.

iii) *Absorbed Poisons*

- Act quickly to remove the source of irritation.
- Wash the exposed areas with soap and water as soon as possible, making up thick soap lather and rinsing several times.
- Do not scrub with a brush.
- If itching and burning have already appeared, wash the affected areas gently with soap and water and put calamine lotion to soothe the itch.

iv) *Injected Poisons*

For minor reaction to insect bite such as sting of bee, you must act quickly to do the following:

- Try to remove sting venous sac by gently scrapping with a sterilized knife.
- Run cold water over and around the sting to relieve pain and slow the absorption of the venom, or place an insulated icebag over it.
- Apply calamine lotion to relieve pain.

For major reaction to insect bite act quickly to perform the following functions:

- Make the victim lie down and immobilize the area of bite.
- A constricting band is then applied above the oedematous area to stop venous blood flow or arterial blood flow.
- The affected part should be kept in dependent position below the level of heart.
- The victim should be promptly taken to the nearest hospital in emergency room.

Check Your Progress 6

- i) List the types of poison commonly occur at home.

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- ii) How will you manage a person who has inhaled poisonous gas accidentally?

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1.4.6 Choking

When food or something goes down the wind pipe rather than down the food passage and he cannot breathe, quickly do the following:

- Stand behind him and wrap your arms around his waist.
- Put your fist against his belly above the navel and below the ribs.
- And press into his belly with a sudden strong upward jerk (see Fig. 1.8).



Fig. 1.8

This forces the air from his lungs and should free his throat. Repeat several times if necessary.

If the person is bigger than you or is already unconscious quickly do the following:

- Lay him on his back
- Sit over him like as shown in Fig. 1.9 with heel of your lower hand on his belly between his navel and ribs.
- Make a quick, strong upward push.



Fig. 1.9

- Repeat several times if necessary.
- If he still cannot breathe, try mouth-to-mouth breathing.
- Transport to hospital as quickly as you can.

1.4.7 Fractures

Any break or crack in continuity of a bone is called a fracture. Fracture may be of many types as given below.

- i) **Closed Fracture:** It is fracture when the skin surface around the broken bone is intact.

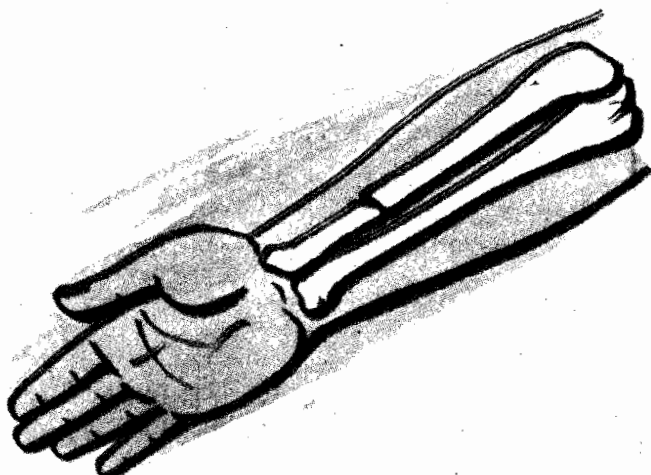


Fig. 1.10

- ii) **Open or Compound Fracture:** In this the fracture is associated with open wound that is caused by the injury or the end of the broken bone. Compound fracture are dangerous, as they involve extensive tissue damage, heavy bleeding and possibility of infection.

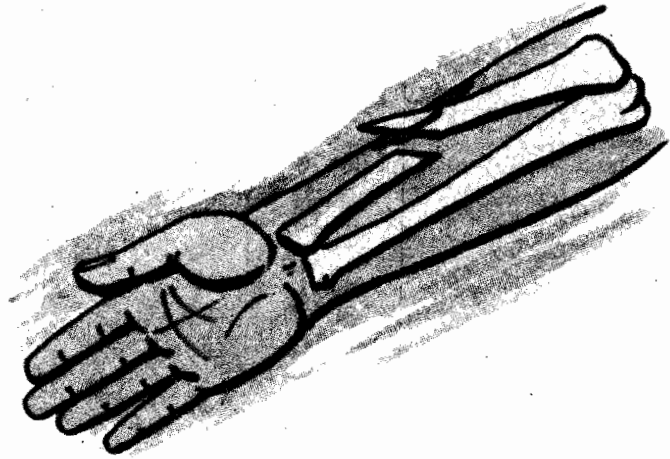


Fig. 1.11

- iii) **Complex Fractures:** In this bone is broken into several pieces or parts of it are shattered. It may be either closed or open.
- iv) **Green Stick:** These are the cracks that do not go all the way through the bone. They occur mostly in young children as the bones are still relatively pliable.

First Aid Treatment for Fractures

- First of all call for (Ring 101 for ambulance and 1099 for CATS–Centralised Accident and Trauma Services) medical assistance especially if the victim has sustained multiple injuries, bleeding, back or neck injury. Till ambulance assistance arrives, take help of another person.
- Prevent the onset of shock by providing a blanket or other coverings to conserve and maintain body temperature.
- If there is any likelihood of a neck or spine injury do not move the victim at all, unless absolutely necessary.

Do not move the injured part unnecessarily.

First Aid Management for Various Fractures

i) **Open Fracture**

- Cut away or remove clothing.
- Control bleeding by applying pressure directly over the wound with clean preferably sterile dressing.
- Cover the protruding bone part with a large sterile bandage or with some kind of clean material.

ii) **Shoulder Fracture**

- Immobilize with sling to support them.
- Bandage the upper arm to the chest.

iii) **Elbow Fracture**

- Handle the arm carefully, since forearm bones may be involved.
- Place arm in a sling and bind the sling to the chest.

iv) **Wrist and Forearm Fracture**

- Immobilize the limb by applying padded splints on both sides of the arm (splints can be

made of tightly rolled newspaper, layers of cardboard or other firm material).

- Bend the elbow slightly and place the splinted arm in slightly raised sling with the thumb pointed upward.

v) *Leg Fracture*

- Keep the patient lying down flat with the leg extended.
- If the break is in the lower part of the leg, splint the knee and also the ankle. If the knee or thigh is involved splint the entire leg.

vi) *Ankle and/or Foot Fractures*

- Keep the patient lying down with the injured leg slightly elevated.
- Remove shoes.
- For an open wound apply sterile dressing, if possible.
- Use rolled newspaper, a blanket or a pillow as splint.

vii) *Fractured Jaw :*

- Make the casualty sit with head forward to allow drainage of secretions.
- Remove any broken teeth or foreign matter from the mouth.
- Support the jaw with a soft pad under the jaw and casualty can hold the pad in position.
- Tie the bandage around the casualty's head with knot tied on top of the head.

After first aid shift the person to hospital as early as possible.

1.4.8 Injuries

You have learnt about fractures. Now we shall focus on injuries such as head injury, spinal injury and trauma of ribs. Let us begin with head injury.

Head Injury

The head injury may be caused due to fall, accident or trauma. You have to take following actions:

- Make the casualty lie down.

Your first responsibility is to assess level of consciousness and maintain patent airway.

Watch for following signs and symptoms:

- Drowsiness.
- Vital signs.
- Pupil size and reaction to light, constricted or dilated.
- Vomiting.
- Convulsion.
- Confusion.
- Headache.
- Restlessness.
- Any bleeding/leakage of cerebro spinal fluid from nose, mouth, ear.

Take following measures:

- Observe patient for some time: Patient may become unconscious or may be fully conscious and alert.
- If patient is unconscious immediately transfer to hospital.
- Put and maintain the casualty in supine position with head turned to one side.
- Transportation should be safe/smooth.
- Assess airway, breathing, circulation.

If necessary clear airway and start mouth to mouth breathing while waiting transfer of the casualty.

Remember initial impression of severity must never be regarded as final. Conscious victim can soon become unconscious. An unconscious person with head injury can rapidly recover and become fully conscious, so act accordingly.

Spinal Injury

If there is neck and back injury, carry out following actions:

- Place casualty on hard surface in horizontal position, if possible.
- Let casualty lie still, avoid unnecessary movements.
- Place pad between thighs, knees, ankles.
- Tie feet and ankles together, tie thighs together using elongated piece of cloth.
- Immobilize head and neck region with cushions made up of folded layers of newspapers, purse, hand bag, rolled cloth piece on either side.
- Arrange safe, smooth transportation.
- Transfer to hospital

Trauma of Ribs

- This is very painful but heals on its own:
- Apply two broad triangular bandages around chest in the uninjured area and tie knot in expiratory position. Sometimes it may not be necessary to splint or bind the chest. In such cases, rest is necessary, casualty can be given aspirin tablet to relieve pain.
- Support upper limb on injured side with arm sling.
- Transport in sitting position.
- In complicated cases when injury to lung has occurred or may occur, transport to hospital as soon as possible.

Check Your Progress 7

i) What is Fracture?

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ii) What first aid measures will you take to help a person who has fractured his leg?

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1.5 INSECT BITES AND ANIMAL BITES

Insect stings or bites are injected poisons that can produce local or systemic reaction. Local reactions are characterized by pain, erythema, swelling at the site of injury. Systemic reactions begin within minutes and lead to mild, severe or life threatening situation. We shall focus on bee stings, snake bite, dog bite and monkey bite.

1.5.1 Bee and Wasp Stings

In most cases these stings are not dangerous, but these are extremely painful. In some persons, they may cause allergic shock. The area of the sting becomes red, hot, swollen and painful.

First Aid

- Remove the sting immediately using needle by gently lifting the sting viewed under good light.
- Apply alkali like soda bicarbonate, washing soda or magnesium hydroxide (milk of magnesia).
- If signs of shock develop, treat for allergic shock, refer sub-section 1.4.2.

1.5.2 Scorpion Sting

Some scorpions are far more poisonous than others. To children under 5 years old, scorpion stings can be dangerous, especially if the sting is on the head or body part near the head.

First Aid

- Suction often helps relieve pain.
- Apply strong alkali or a cut slice of raw onion, or juice of tobacco.
- Later on, application of brandy, spirit also will help.
- Refer the victim to hospital.

1.5.3 Snake Bite

All snakes are not poisonous nor they can out run man as is commonly believed. There are only four common poisonous snakes in India. Try to find out their names in your area of work.

- i) Common cobra (Nag).
- ii) Common krait (Bangarus).
- iii) Russel's viper (Daboia).
- iv) Saw-scaled viper (Phoorsa).

When a person has been bitten by a snake, try to find out if the snake was poisonous or not. Their bite marks are different (see Fig 1.12)

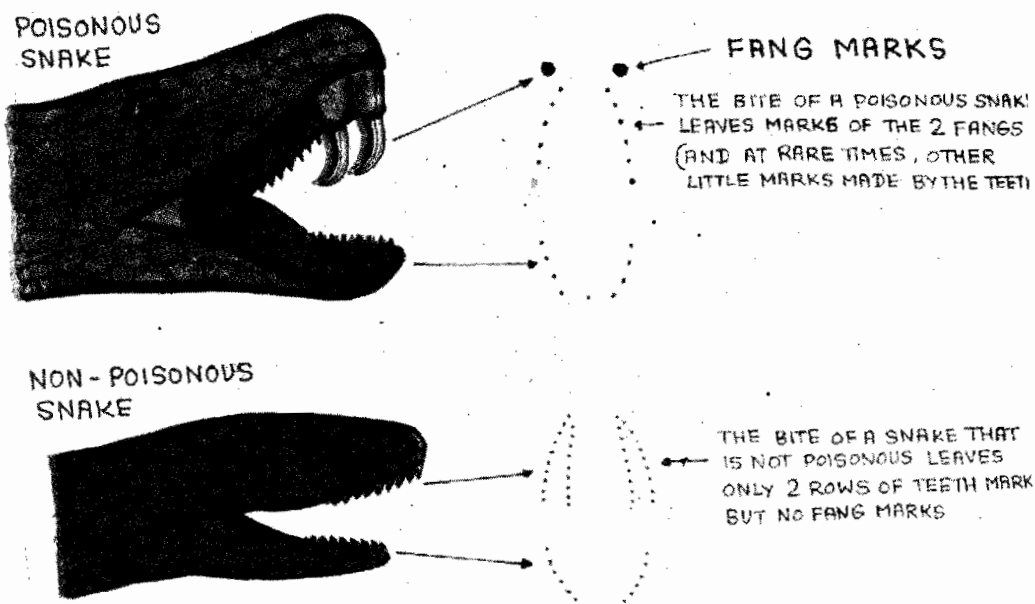


Fig. 1.12

Most often the bite marks are not so clear as shown in Fig. 1.12. There may be just one faint mark or just a row of teeth marks or a ragged tear at the site of wound. When in doubt, always look for the local and general signs of poisoning and keep the person under observation for at least one day.

The poison from cobra and krait affect the nervous system. The viper venom affects the blood and prevents it from clotting.

People often believe that certain harmless snakes are poisonous. **Do not kill non-poisonous snakes** because they do not harm. On the contrary, they kill mice and other pests that do lots of damage, some even kill poisonous snakes.

Signs of Poisonous Snake Bite

These signs appear within 15 to 30 minutes of bite.

- Pain – may be quite severe and may last for many days.
- Swelling – depends on the amount of poison that has entered the blood. In case of viper bites, pain and swelling at the site of bite is more severe.
- Bleeding – from the bite is more common in case of viper bite.
- Discoloration – of skin around the area of the bite.
- Infection and gangrene may also develop.

General Signs

These develop from 15 minutes to one hour after the bite.

Cobra and Krait affect the nervous system

- Drowsiness
- Weakness of the muscles, especially the muscles around the eyes. The person may start seeing double (double vision) and may develop a squint.
- Paralysis of muscles.
- Respiratory failure may lead to death.

Vipers affects the clotting of blood. These signs are:

- Headache, giddiness
- Nausea, vomiting
- Cough with blood stained phlegm sputum
- Bleeding under the skin
- Signs of shock if there is too much bleeding.

First Aid in Snake Bite

- Stay quiet; do not move the part that has been bitten: The more it is moved the more rapidly the poison will spread through the body. A person who has been bitten on the foot should not walk, not even one step if it can be avoided. Carry him on a stretcher.
- Tie a cloth around the limb, just above the bite. Do not tie it very tight, and loosen it for a moment every half an hour.
- With a very clean knife (sterilised in a flame) make a cut into each fang mark about 1 cm, long and 1/2 cm deep, and let it bleed. Hot fomentation can be used to increase bleeding.
- Rub Potassium permagnate crystals over the cut.
- Then suck (and spit out) the poison for a quarter hour.

If more than half an hour has passed since the bite, do not cut or suck the wound, as then it may do more harm than good.

- If the victim becomes drowsy provide a stimulating drink, apply cold to face and keep the victim awake.
- Provide CPR if the victim stops breathing.
- If you can get ice, wrap pieces in thick cloth and pack these around limb that was bitten.
- Give tetanus toxoid injection to prevent tetanus.
- If signs of infection develop, use antibiotics as prescribed.
- Remove the casualty to hospital as fast as possible.

Poisonous snake bite is dangerous. Send for medical help at once but always do the things explained above at once.

Home folk remedies for snake bite do little if any good. Never drink alcohol or a snake bite. Alcohol worsens the condition.

Animal Bite

Animals have sharp pointed teeth and they harbour germs (bacteria) in mouth. Their bites often leave deep puncture wounds and germs may be injected into the tissue.

Any bite causing break in the skin needs prompt attention to prevent infection.

Let us now describe the first aid measures required in dog bite.

1.5.4 Dog Bite

Dog bite is very common. Dog bite may result in multiple laceration or break in the skin.

Dog bite may cause rabies by the infected saliva. Therefore, if you come across a case of dog bite you have to make sure whether the dog was infected or not and the casualty should get a course of injections to prevent rabies. If possible, find out if the dog is pet and vaccinated or stray.

Signs and Symptoms

- One or more small punctured wounds.
- Lacerations indicating tearing bite.
- There may be slight or severe bleeding.

To confirm a rabies infection the animal must be examined immediately. If animal escapes notify the police.

How will you take care of wound caused by dog bite?

For superficial wound:

- Wash thoroughly with soap and water, or apply caustic soda over the wound.
- Dry it and cover with sterile unmedicated dressing.
- Seek medical help.

For serious wounds:

- Control bleeding and do dressing.
- Cover with a sterile unmedicated dressing and bandage it.
- Shift to hospital.

1.6 EMERGENCIES CAUSED BY HEAT AND COLD

We shall discuss heat cramps, heat stroke, and heat exhaustion in the following sub-sections.

1.6.1 Heat Cramps

In hot weather people who work hard and sweat a lot may sometimes get painful cramps in their legs, arms or stomach. These occur because the body loses fluids and salt in form of sweat etc. (Fig. 1.13)

What measures you need to take?

Put a teaspoon of salt in a litre of boiled cold water and drink it. You can add a little sugar and lime juice to drink.

1.6.2 Heat Stroke (Sunstroke)

Heat stroke is when body temperature rises up to 108°F (42°C) with increased environmental temperature to which body's heat control system can't cope up with.

Heat stroke is not very common, but is very dangerous. It occurs especially in older people and alcoholics during hot weather.

Signs and Symptoms

The skin is red, very hot and dry. (Not even the armpits are moist).

The person has a very high fever, sometimes more than 42°C.

The person is unconscious.



Fig. 1.13

What measures you need to take?

The body temperature must be lowered immediately.

- Move the person in the shade, cool place.
- Take off his clothes, wrap the casualty in cold wet sheet and pour cold water over him.
- Massaging the extremities and torso.
- Keep the casualty cool with a fan.
- Take the temperature, every ten minutes, if it comes down to 38°C. Stop pouring cold water on him, and dry him but if temperature rises above 38°C repeat the cooling procedure.
- Take medical aid.

1.6.3 Heat Exhaustion

Inability of the body to cool itself by directing blood to the skin and is caused by loss of fluid and salt during profuse sweating.

Signs and Symptoms

- Body temperature above 98.6°F (37°C) but below 102°F (38.9°C)
- Rapid and weak pulse
- Pale and clammy skin
- Profuse sweating
- Tiredness and weakness
- Nausea and vomiting
- Headache
- Muscle cramps

What measures you need to take?

- Move the person lie down in a cool place, with legs elevate 20-30 cm
- Loosen his clothings and cool him gently with wet clothes or a fan.
- Give salt water to drink (1 teaspoon of salt in a litre of water). Stop giving salt water if the victim vomits.

- Seek medical help if symptoms continue for an hour.
- Massage the cramped muscles firmly until they relax.



Fig. 1.14

Give nothing by mouth if the person is unconscious.

DIFFERENCES BETWEEN 'HEAT EXHAUSTION' AND 'HEAT STROKE'	
HEAT EXHAUSTION	HEAT STROKE
SWEATY, PALE AND COOL SKIN	DRY, RED, HOT SKIN
LARGE PUPILS	HIGH FEVER
NO FEVER.	THE PERSON IS VERY ILL OR UNCONSCIOUS
WEAKNESS	

Fig. 1.15

To avoid all these emergencies due to too much heat, always drink plenty of water with salt throughout the day in summer.

1.6.4 Hypothermia

Prolonged exposure to cold environment, cold water, poorly dressed, can significantly bring down body temperature producing hypothermia.

Extreme hypothermia is suspected when the victim's core temperature is too low to be recorded on a clinical thermometer.

Infants, elderly and persons with neurological, chronic lung and heart disease, addicted to drugs or alcohol are at risk for developing hypothermia even in less extreme conditions.

Signs and Symptoms

- Shivering and feeling cold
- Body temperature below 90°F (32.2°C)
- Drowsiness and weakness
- Pale, bluish, puffy skin
- Slurred speech, confusion
- Unconsciousness, rigid muscles

In Infants

- Red cheeks, chin, tip of nose or limbs
- No crying
- Weak sucking

First Aid

- Move the victim in shelter or to warm room if possible
- Remove any wet clothes
- Dry and wrap the victim in sheet, blanket
- Provide body warmth in case of infants (Kangaroo method)
- If conscious give warm beverage—tea, coffee, soup etc.
- Refer to medical aid.

1.6.5 Frostbite

Frostbite occurs when body tissues freeze, parts of the body that are exposed or have poor circulation especially, fingers, toes, nose and the ears. The condition gets worse on wearing wet clothes, shoes, gloves and exposure to strong winds. When warmed frozen tissues swell, blister and become discolored.

Signs and Symptoms

- Red and painful skin in early frostbite (also called chilblains).
- With continuing exposure mottled, waxy skin.
- Numbness.
- Blisters.

First Aid

When you come across the case of frostbite do first aid as given below:

- Cover the person with blankets and or loose layer of clothing and seek shelter. Keep the frost bitten part wrapped next to victim's body for warmth.
- If the skin is still soft, remove any rings or other constricting jewellery, rewarm the frozen area by immersing in warm water, but not hot water.
- If the skin is hard or if no water is available warm the frost-bite area with your warm hands.
- Stop warming procedure as soon as the area becomes flushed and help the patient to change into warm dry clothing if available.
- Avoid alcohol and smoking tobacco.
- Refer the patient to the hospital for further treatment.

To prevent frostbite, you can advise client regarding following measures:

- Listen to weather forecast and avoid exposure to cold weather.
- Wear protective clothing including thermal underwear, a loose shirt, loose trousers, wind and moisture repellent outer garments, woollen wears.
- Maintain general circulation by moving about or do some activity.
- Know the early symptoms of frostbite and take precautions.

Check Your Progress 8

i) List the types of snakes in India.

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ii) What precautions you will take if you come across a case of snake bite?

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iii) How is rabies spread by dog bite?

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1.7 OTHER EMERGENCY SITUATIONS

In addition to the condition explained in previous sections, some more conditions requiring first aid treatment are given below:

1.7.1 Angina Pectoris and Heart Attack

In this the patient will complain of pain in the chest which radiates to shoulders and jaw, left arm and fingers. The pain usually subsides after taking rest. Patient complains of dryness of mouth, perspiration and dyspnoea.

What measures you will take:

- Provide complete rest.
- Quiet environment
- If discomfort or pain continues one tablet of nitroglycerine 0.4 mg is given sublingually (under the tongue).
- Refer immediately to hospital.

Heart Attack (Myocardial Infarction)

This occurs when a blood clot blocks a coronary artery preventing blood from reaching the heart muscles.

Signs and Symptoms

- Sudden crushing pain in the centre of chest, which may spread to left shoulder, back, arms, throat, jaw etc. (Fig. 1.16)
- Sudden dizziness or giddiness.
- Skin may be ashen.
- Blue lips and extremities.

- Profuse sweating.



Fig. 1.16

- Breathlessness.
- Fast pulse which becomes weaker and irregular (shock).
- Unconsciousness.
- Stop of heart beat and respiration.

What measures will you take?

- Make the patient lie down.
- Loosen constricted and tight clothings.
- Arrange for smooth, safe transportation.
- Do not leave patient unattended.
- Ice may be given to suck if patient wishes, otherwise withhold food and fluids.
- Check breathing rate, pulse and levels of responsiveness frequently at 10 minutes interval.
- Reassure the patient and transfer the victim to the hospital without wasting any time.
- Begin resuscitation if breathing stops.



Fig. 1.17

1.7.2 Cardiac Arrest (Cardiopulmonary Arrest)

This is a serious condition in which heart suddenly stops beating.

Signs and Symptoms

- Unconsciousness.
- Pale colour.
- No pulse felt at neck.
- No respiration or effort for breathing.

What Measures Will You Take?

- Loosen clothing around neck, chest and waist.
- Start cardio-pulmonary resuscitation as already discussed.
- Maintain clean airway.
- Give mouth to mouth breathing.
- Give external cardiac massage, if necessary. Refer Section 1.3 for more details.
- Refer to hospital immediately.

1.8 LET US SUM UP

In this unit you have learnt first aid in emergencies. We have discussed about the concepts, objectives and principles of first aid. We have also focussed on management of various selected emergency situations such as bleeding, shock, burns, fractures, injuries, insect bites, animal bites and various other emergencies. As a health worker, you need to provide first aid in these situations before referring them to appropriate agencies.

1.9 MODEL ANSWERS

Check Your Progress 1

- i)
 - a) To preserve life
 - b) To prevent further injury
 - c) To help to avail professional or medical help
- ii)
 - a) Make sure of clear airway – restore respiration
 - b) Check for bleeding
 - c) Act fast shifting the patient to hospital for medical aid.

Check Your Progress 2

- i)
 - Palmonary resuscitation
 - Cardiac resuscitation
 - Cardio pulmonary resuscitation (CPR)
- ii)
 - a) Airway clearance
 - b) Breathing maintenance
 - c) Circulation maintenance

Check Your Progress 3

- i)
 - Have victim lie down with raised part.
 - Apply firm pressure over wound.
 - If venous bleeding pressure below wound.
 - If arterial bleeding apply tourniquet above wound.

- Apply firm bandage.
- Treat shock.
- Refer to centre or hospital.
- ii) ● Intense pain
 - Extreme trauma
 - Burns
 - Poisons
 - Extreme heat or cold
- iii) ● Level of consciousness
 - Skin changes
 - Pulse, Respiration
 - Urinary output
 - Neuro muscular changes
 - Gastrointestinal changes

Check Your Progress 4

- i) Punctured wound is caused due to sharp pointed objects like nail, knife, bullet etc
- ii) ● Wash with clean or boiled water
 - Remove foreign matter
 - Wash with antiseptic lotion
 - Apply clean or sterile dressing
 - Check for bleeding
 - Give injection tetanus toxoid

Check Your Progress 5

- i) ● Thermal burns
 - Acid burns
 - Alkali burns
- ii) ● Immerse the burn part in cold water
 - Apply cold pack
 - Do not puncture the blister
 - If open blister wash with antiseptic and apply antibiotic ointment
 - Change dressing
 - Refer to health centre

Check Your Progress 6

- i) ● Insecticides
 - Wrong medication
 - Kerosene oil
 - Detergent
 - Inhaled gases
 - Carbon-monoxide
 - Other gases
- ii) ● Remove from gaseous area
 - Loosen clothing
 - Clean airway
 - Apply CPR if required
 - Shift to nearby centre

- i) Break or crack in continuity of a bone
- ii) ● Keep the casualty, lying down, leg flat or extended.
 - Apply splint.
 - Control bleeding if present.
 - Immobilise the leg by splinting the lower part of the leg, knee and ankle. Splint the entire leg if lower leg is involved.

Check Your Progress 8

- i) ● Common cobra
 - Common krait
 - Common viper
 - Saw-scaled viper
- ii) ● Tie a cloth around the limbs above the bite.
 - Make a cut in fang with clean knife.
 - Do not tie a cloth very tightly, release in between.
 - Shift for medical aid.
- iii) Rabies is spread by saliva of the infected dog bite.