UNIT 4 FIRST AID TECHNIQUES AND STABILISATION CARE IN COMMON EMERGENCIES - 1

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4.0 INTRODUCTION

Vigilance in providing the basic life saving measures for acute emergencies is an essential responsibility of community health nurse practitioner in order to reduce the magnitude of deaths particularly in the areas where these conditions prevail and where unfortunately the appropriate medical facilities are not available. In Practical 3 you have learnt skills for providing management of common ache and pains. In this practical we will learn the skills required to provide the First Aid measures to patients in common emergency conditions e.g. High fever, hyperglycemic shock (diabetic coma), hypoglycemic shock (insulin coma), fracture, wound, minor injuries, haemorrhage, shock, drowning and surgical trauma.

4.1 OBJECTIVES

After completing this unit, you should be able to:

- describe the First Aid measures for stabilising the conditions of the patients with high fever, hyperglycemic shock (diabetic coma), hypoglycemic shock (insulin coma), fracture, wound, minor injuries, haemorrhage, shock, drowning and surgical trauma;

- demonstrate the First Aid measures on patient with conditions mentioned above; and

- manage these patients.
4.2 PROVIDE BASIC RESUSCITATION AND FIRST AID

First aid, as is known all over the world, has been practiced ever since the inception of the humanity. Basic resuscitation and First aid is the provision of life saving initial care for the acute, emergency illnesses or injuries. It can be performed either by a non-expert but trained personnel or by professionally trained personnel such as community health worker to a sick or injured person until definitive medical treatment can be accessed. Certain self-limiting illnesses/ minor injuries such as high fever, hyperglycemic shock and hypoglycemic shock, fractures, wounds, minor injuries, haemorrhage, shock, drowning and surgical traumas etc. may not require further medical care, these are rather treated at home or at a sub-centre by trained personnel unless complicated. It generally consists of a series of simple and in some cases, potentially life-saving techniques that an individual can be trained to perform with minimal equipment.

The key aims of first aid are:

i) Preserve life of the victim.

ii) Prevent further harm i.e. applying first aid techniques to prevent worsening of the condition, such as applying pressure to stop a bleed becoming dangerous.

iii) Promote recovery from the illness or injury such as in the case of applying a plaster to a small wound.

Certain skills are considered essential to the provision of first aid and are taught universally. Particularly the “ABCs” of first aid, which focuses on critical life-saving intervention, must be rendered before treatment of less serious injuries/conditions. ABC stands for Airway, Breathing, and Circulation. Attention must first be brought to the airway to ensure it is clear. Obstruction (choking) is a life-threatening emergency. Following evaluation of the airway, the first aider would determine adequacy of breathing and provide rescue breathing if necessary. If there is no breathing, or the patient is not breathing normally, the first aider would undertake what is probably the most recognised first aid procedure- Cardiopulmonary resuscitation (CPR), which involves artificial breathing or mouth to mouth breathing to the victim and manually providing chest compressions to the heart to promote blood flow around the body followed by assessment of circulation by checking pulse.

As a mid level health care provider your duty is to perform these life saving measures to save and sustain life of the victim till the patient is transferred to the hospital.

4.3 FIRST AID MANAGEMENT IN SPECIFIC EMERGENCY CONDITIONS

During emergency situations, as health care worker your essential duty is to identify quickly the sick, wounded or injured victims in order to prioritise their emergency care. For that you need to acquire a sound knowledge and competent skill for assessing and managing the patients in various critical conditions through providing basic life support and first aid measures during various emergency illnesses or injuries as discussed below.
4.3.1 Fever

Fever also known as pyrexia is high temperature when a human’s body temperature goes above 37°C (100°F). A fever is not by itself an illness. It is usually a symptom of an underlying condition, most often an infection. (Fig. 4.1)

Body temperature, which usually varies throughout the day from the normal temperature of 98.6°F, is controlled by a part of the brain called the hypothalamus.

![Fig.4.1 : Degrees of temperature](image)

Assessment of patient with fever:

When a patient comes with fever, assess the patient for signs and symptoms as follows:

1) Enquire how the fever started and how it progressed.
2) Look for and ask about above vital signs and symptoms as well as other accompanying signs and symptoms such as: nausea, vomiting, diarrhoea, cough, fast breathing, increased pulse rate, running nose, neck stiffness, difficulty, urgency and burning in urination, weight loss, jaundice or drowsiness.
3) Look for a skin rash and observe and enquire about signs and symptoms associated with various diseases or infections such as: respiratory infection, meningitis, chickenpox, measles, mumps, malaria, typhoid, pulmonary tuberculosis etc.
4) Ask if there is pain in any specific part of the body like pain in chest, back or abdomen, joint pain, sore throat or earache.
5) Ask if the patient has recently travelled to areas with endemic infections or have other infection risks. A malaria infection, for example, may be having a fever that typically recurs.
6) Ask whether patient is taking any medications, if any then since how long and what for.
7) Assist physician in performing thorough physical examination of patient to find out the possible causative factors and their associated signs and symptoms.
8) Take thorough health history to enquire about whether patient has previous H/O chronic illness or chronic infection.
9) Sometimes the patient may have a “fever of unknown origin”. In such cases, the cause could be an unusual such as a chronic infection, an autoimmune disorder or cancer.
10) Take temperature of the patient and if having fever, treat the patient accordingly.

**Don’t miss the classical picture of malaria– fever with rigors, chills and bodyaches, and coming down with sweating.**

**First aid Treatment:**

After doing assessment of the patient, if you notice some of these symptoms (as mentioned above) record the temperature by using a thermometer. If the temperature is above 37°C, it is a fever, proceed as follows:

1) Make the patient comfortable and keep him/her cool, ideally in bed with a sheet or light blanket (in case of chills).

2) Give the plenty of cool drinks to replace any fluid loss from sweating.

3) If the temperature is above 39°C, place the cold compresses (cool and moist cloths) on head, buttocks, back as well as in hands, axilla and groin to cover large superficial blood vessels which will lower the body temperature.

5) Change the compresses every few minutes as it becomes warm and continue applying compresses for 15 to 20 minutes.

**Be careful while applying cold compress to children as they react very quickly to heat or cold, therefore monitor their temperature after every fifteen minutes in order to prevent them from hypothermia.**

6) Teach a family member the procedure for application of cold compress.

7) Give prescribed 250 to 500 mg of syrup/tablet paracetamol to the child/adult after every 6 hourly if fever and body aches persist.

8) Give prescribed antibiotics such as syrupamoxicillin 250 mg to child and capsule 500 mg amoxicillin to adult every 8 hourly for 5 days.

9) Give prescribed non-steroidal anti-inflammatory drugs such as: ibugesic forte 100 to 200 mg SOS in case of sore throat.

10) Check the TPR and level of response every 4 hourly until the patient feels better.
11) If the fever does not subside, advise the patient for blood tests to rule out the cause of fever such as upper respiratory infection, malaria, typhoid etc. under care of physician.

**Remember:**

Fever is common in children.

a) If a young child’s temperature goes above 39°C (102. 2°F) this can be dangerous and might trigger a seizure (fit).

b) If the fever persists and even if it is not high and no other specific signs or symptoms are present.

Then in both the cases (a and b) refer the patient to nearby hospital for further investigation and treatment.

4.3.2 Hyperglycemic Shock (Diabetic Coma) and Hypoglycemic Shock (Insulin Coma)

**Hyperglycemic shock** also called **diabetic coma** is a life-threatening condition in
which blood glucose level increases to 300 mg/dl or above. It results due to incomplete metabolism of glucose owing to lack of circulating insulin.

**Hypoglycemic shock** also known as **Insulin coma** is a serious condition in which blood glucose level decreases to 50 mg/dl or below which may result from various causes.

Whenever a patient with hyperglycemic shock or hypoglycemic shock reports to you. Ask history of illness and assess the warning signs (given in Box 4.1) which will guide you in quickly identifying the condition and giving emergency treatment before referral.

When the patient is brought to the PHC, it is not confirmed whether the patient is suffering from hyperglycemic shock or hypoglycemic shock. Therefore as community health nurse practitioner your first and foremost responsibility is to make the patient comfortable and obtain a comprehensive history of illness by asking, listening and critically observing and differentiating warning signs and symptoms (given in Box 4.1) which will help you in determining whether the patient is suffering from hyperglycemic shock or hypoglycemic shock.

**Assessment of patient with hyper/ hypoglycemic shock**:

Assessment of the patient with hyper or hypoglycemic shock includes 2 steps:

**Step 1:**

**A) History taking for identifying the patient with hyperglycemic shock:**

History of illness is taken to find out whether the patient:

i) Is an undiagnosed case of diabetes mellitus

ii) Is a known case of diabetes mellitus but is not taking regular treatment or has left the treatment.

iii) Has previous H/O of:

   a) Infection
   b) Surgery
   c) Trauma
   d) Mental Stress

**B) History taking for identifying the patient with Hypoglycemic shock:**

The patient is asked whether he/she is a known case of diabetes mellitus and has H/O:

a) Delayed intake of meals

b) High dose of insulin

c) Delayed intake of meals after taking insulin dose

d) Excessive exercises

**Step 2:**

**Assessing the patient for signs and symptoms of Hyper/ Hypoglycemic Shock (Box 4.1)**
After gathering the information related to history of illness, the next step is to quickly examine the patient for the possible warning signs and symptoms (given in Box 4.1) and critically analyse them for determining the condition of the patient and for taking appropriate steps of management.

**Box 4.1: Signs and symptoms of Hyper/ Hypoglycemic Shock**

<table>
<thead>
<tr>
<th><strong>Hyperglycemic Shock (Diabetic coma)</strong></th>
<th><strong>Hypoglycemic Shock (Insulin coma)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dry and hot skin</td>
<td>• Cold and clammy skin with sweating</td>
</tr>
<tr>
<td>• Deep and sighing breathing</td>
<td>• Shallow and quiet breathing</td>
</tr>
<tr>
<td>• Unconsciousness, deep or stupor</td>
<td>• Fainting-rarely unconsciousness</td>
</tr>
<tr>
<td>• May smell of acetone (mostly apple smell)</td>
<td>• No smell of acetone</td>
</tr>
<tr>
<td>• Sunken eyes</td>
<td>• Dilated pupil</td>
</tr>
<tr>
<td>• Blurred vision</td>
<td>• Tremors</td>
</tr>
<tr>
<td>• Nausea and vomiting</td>
<td>• Nervousness</td>
</tr>
<tr>
<td>• Epigastric pain</td>
<td>• Hunger</td>
</tr>
<tr>
<td>• Increased thirst</td>
<td>• Fast and thready pulse</td>
</tr>
<tr>
<td>• Dull headache</td>
<td>• Dizziness</td>
</tr>
<tr>
<td>• Increased pulse rate</td>
<td>• Convulsions</td>
</tr>
<tr>
<td>• Low BP</td>
<td>• Slurred speech</td>
</tr>
<tr>
<td>• Serum glucose level is above than 300 mg/dl</td>
<td>• Low BP</td>
</tr>
<tr>
<td>• Presence of sugar and acetone in urine</td>
<td>• Serum glucose level is less than 50 mg/dl</td>
</tr>
<tr>
<td></td>
<td>• Absence of sugar and acetone in urine</td>
</tr>
</tbody>
</table>

**Management of patient with hyper/hypo glycemic shock**

After taking the history and doing assessment following activities shall be carried out quickly to stabilise the condition of the patient at PHC before referral:

**The interventional activities (given in Box 4.2) will guide you in managing quickly the patient with Hyper or Hypoglycemic Shock.**

**Box 4.2: Activities for Stabilising Condition of Patient with Hyper/Hypoglycemic Shock**

<table>
<thead>
<tr>
<th><strong>Hyperglycemic Shock (Diabetic coma)</strong></th>
<th><strong>Hypoglycemic Shock (Insulin coma)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Make the patient to lie in comfortable position.</td>
<td>1. Make the patient lie to in comfortable position.</td>
</tr>
<tr>
<td>2. Keep the airway patent.</td>
<td>2. Keep the airway patent.</td>
</tr>
<tr>
<td>3. Check the vital signs every 15 minutes.</td>
<td>3. Check the vital signs every 15 minutes.</td>
</tr>
<tr>
<td>Hyperglycemic Shock (Diabetic coma)</td>
<td>Hypoglycemic Shock (Insulin coma)</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>5. Get blood sample tested for glucose by glycometer (if available) or send it to laboratory for urgent testing.</td>
<td>5. Get blood sample tested for sugar immediately by glycometer (if available) or send it to laboratory for urgent testing.</td>
</tr>
<tr>
<td>6. After confirmation of blood glucose level if it is above 300 mg/dl. Start I/V line with fast infusion of 0.9% normal saline or 0.45% approximately 0.5 to 1 litre/hour (as per physician’s order).</td>
<td>6. If patient is found hypoglycemic, (blood glucose level&lt;50 mg/dl) Start I/V line with slow infusion of 25-50 ml of 50% dextrose.</td>
</tr>
<tr>
<td>7. Give bolus dose of regular insulin (0.1 unit/kg) stat followed by I/V infusion pump (0.1 unit/kg/hour) as per physician’s order.</td>
<td>7. If patient is conscious, give 2 to 3 spoons of sugar or honey or 4 to 6 ounces of fruit juice or 6 to 10 hard candies.</td>
</tr>
<tr>
<td>8. Maintain the rate of saline infusion and change it to dextrose 5% if blood sugar level falls to 250 mg/dl (as per physician’s order) in order to avoid a too rapid drop in blood glucose level.</td>
<td>8. If patient is found unconscious, give an injection of epinephrine or glucagon 1mg subcutaneously after physician’s order to raise the blood glucose level and wait for 20 minutes till patient regains consciousness.</td>
</tr>
<tr>
<td>9. Maintain the rate of insulin infusion continuously until the subcutaneous administration of insulin can be resumed.</td>
<td>9. On awakening give a carbohydrate snack to prevent recurrence of hypoglycemia.</td>
</tr>
</tbody>
</table>

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**Fig. 4.2:** Give bolus dose of regular insulin

**Fig. 4.3:** Maintain the rate of insulin infusion

**Fig. 4.4:** Check blood pressure regularly

10. Check the blood glucose every one hourly.
11. Monitor the vital signs every half hourly.
12. Check the patient’s level of consciousness.
13. Assess the patient for the signs of recovery.
14. After patient is stabilised, refer the patient to district hospital for further investigation and treatment.
4.3.3 Fractures

A fracture is the partial or complete break in the continuity of the bone with / without displacement of bone fragments which occurs when pressure is applied to bone. One out of five people has a fracture at some point of time in their lives, and the maximum of these fractures occur during childhood.

The commonest causes of fracture in a healthy person are direct and indirect violence

Types of fracture (Refer Course 2, Block 1, Unit 5):

The three major types of fracture are:

a) Simple or Closed fracture

It is that type of fracture in which the broken ends of the bone do not break the skin i.e. no wound is seen outside the skin.

b) Compound or Open fracture

In this type of fracture the broken ends of the bone are in contact with the skin i.e. Skin breaks causing open wound.

Assessment of patient with fracture

The assessment of a fracture is based on three points:

1) History: The patient will tell you that he has fallen or that he has been hit by something.

2) Symptoms: These include;
   a) Pain at or around the site of the fracture.
   b) Tenderness accompanied by pain on gentle pressure over the site of fracture. (DO NOT PRESS HARD)
   c) Loss of power function in the fractured limb.

3) Signs: These include:
   a) Deformity (abnormal twist of limb):
      The normal shape and alignment of the limb is changed (COMPARE WITH THE OTHER LIMB). Sometimes the muscles will pull up the lower free ends, causing apparent shortening of the limb.
   b) Swelling / bruising / bleeding at or around the site of fracture. This is caused by the overlapping of the broken ends and tearing of blood vessels.
   c) Difficulty or loss of movement of the part due to broken end of bone.
   d) The crackling sound of broken bones called crepitus may be felt.
   e) Sometimes unnatural movement at the spot of fracture may be felt.

- To confirm diagnosis compare with the sound limb. Look for tear of clothing or skin at the site of fracture. Ask and listen very keenly to the patient as he/she may sometimes say that he/she had heard the crack of the bone.
- Never try first aid if the last two signs are present. Refer the patient immediately to district hospital for appropriate treatment.
### Major Effects of Fracture:
- Pain
- Damage to surrounding tissues and blood vessels.
- Bleeding & shock (fractures of large bones may result in considerable loss of blood, e.g. a fractured thigh results in the loss of 1 or 2 litres)

### Management of patient with fracture
All fracture cases should be given first aid treatment except when last two signs mentioned above are present in order to stabilise their condition and make them comfortable for shifting them to the hospital for further treatment.

The objectives of first aid with fracture are:
1) To prevent further damage
2) To reduce pain
3) To make the patient comfortable, and
4) To get medical aid as soon as possible.

- The first three objectives (given above) are achieved by immobilisation.
- There are some rules (given in Box 4.3) which you should follow while dealing with fracture.

### Box 4.3: Rules for dealing with fracture

<table>
<thead>
<tr>
<th>DO NOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Massage the affected area (Fig. 4.5)</td>
</tr>
<tr>
<td>• Apply any ointments like iodex</td>
</tr>
<tr>
<td>• Straighten the broken bone</td>
</tr>
<tr>
<td>• Move the injured part or limb</td>
</tr>
<tr>
<td>• Move joints above and below the fracture</td>
</tr>
<tr>
<td>• Attempt to set the fracture</td>
</tr>
<tr>
<td>• Try to push a protruding bone back into place</td>
</tr>
<tr>
<td>• Give oral liquids or food</td>
</tr>
</tbody>
</table>

**Fig. 4.5 : Never massage or press the fractured area**
As the fractures are usually accompanied by major accidents and when patient in such condition reports to PHC. Your first responsibility is quickly to find other injuries and decide which is more important. Heavy bleeding and severely wounded parts are more urgent and are treated first. There may be more than one fracture in the same patient or even in the same limb. Stabilise first the patient’s condition by taking care of airway, breathing and circulation. If there is no immediate danger to life then proceed with first aid treatment according to type and location of fracture as follows:

1) **Closed fracture**
   
   a) Place the patient in a comfortable position with the injured part well supported.
   
   b) Clothing should not be removed. If it has to be removed, do it gently or tear it along the line of stitching.
   
   c) Immobilise the injured part with a splint or bandage. Remember that the joints below and above the fracture must be immobilised.
   
   d) Treat for shock but do not give any drink as the patient may have to have an anaesthetic on arrival at the hospital for setting the fracture.

2) **Open fracture**
   
   a) Follow the same procedure as mentioned in (a) and (c) steps for closed fracture.
   
   b) Cut or remove away the clothing over the wound and cover it with a sterile dressing.
   
   c) Stop any bleeding by applying a pad and bandage. If the bleeding is arterial, press the artery at the pressure point with the fingers or apply a tourniquet.
   
   d) Take special measures for treating shock.

   **Box 4.4 : Instructions for providing first aid to fractured victim**

<table>
<thead>
<tr>
<th>For open fractures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control bleeding before treatment</td>
</tr>
<tr>
<td>2. Rinse and dress the wound</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>For both open and closed fractures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Check the breathing</td>
</tr>
<tr>
<td>• Calm the person</td>
</tr>
<tr>
<td>• Examine for other injuries</td>
</tr>
<tr>
<td>• Immobilise the broken wound</td>
</tr>
<tr>
<td>• Apply ice to reduce pain / swelling</td>
</tr>
<tr>
<td>• Consult a doctor</td>
</tr>
</tbody>
</table>

**Application of Splint:**

**What is splint and how can it be improvised?**

A splint is a rigid appliance, usually made of wood or metal, which is tied to a fractured limb to support it and prevent movement from taking place at the site of fracture. Some first aid kits are supplied with wooden splints or metal splints made of aluminium or stout wire. The latter could be cut to the required size and moulded to the required shape.
However, in emergency splints can be improvised by using any article which is rigid enough and of sufficient length for the purpose for which it is required. Rolled newspapers, magazines, piece of wood, card board etc. have been used for splinting in case of emergency. The body itself can be used for splinting purposes, e.g. a fractured arm can be strapped to the side of the chest to immobilise it or a fractured leg can be tied to the other leg.

**Why to use the splint?**

The injured or fractured part or limbs immobilised immediately with a splint or bandage so that no movement of the part or limb is possible. This stops further injury and helps to stop the bleeding and the danger of broken ends of bone, damaging the arteries, nerves and muscles is prevented.

![Image: Splinting a fractured forearm](Image)

**Fig. 4.6 : Splinting a fractured forearm**

- **What points to keep in mind while using a splint?**

  If a splint is not used properly, it may cause damage. Therefore, remember the following points when using a splint. (Fig. 4.6)

  a) Make sure that the splint is well padded. This is particularly important when splint are improvised from pieces of wood which are uneven.

  b) Make sure that the splint is sufficiently long to immobilise the joint above and below the fracture.

  c) Make sure that he bandages used to secure the splint have the knots tied on the splint and not on the flesh.

**Application of bandage: (Fig. 4.7)**

A bandage is made up of gauze which is used in fracture for the following purposes:

a) To keep the dressing of wound in open fracture in place.

b) To immobilise the fractured part or limb.

c) To reduce the swelling

d) To retain a splint in position
Points to remember while bandaging:

In order to facilitate the safe bandaging follow the instructions given as below:

a) Use bandaging fairly firm so that there is no movement of fractured ends but not too tight which can stop the circulation of the blood to the area. (Fig 4.8)

b) Always place padding material between the ankles and knees and other hollow areas before bandaging these, to make them comfortable and steady.

c) Always tie knots on the smooth side.

Specific fractures and their first aid treatment:

1) Fracture of the base of the skull

This is the fracture of the bones forming the base of the skull. As these bones are not seen on outside of the body, obviously they cannot be fractured by a direct blow and such a fracture always results from indirect violence.

- **Signs and symptoms**
  
a) Bleeding from the ear or nose
  
b) Headache

- **Treatment**
  
a) Apply a clean sterile dressing to the nose or ear from where the bleeding occurs.
  
b) Turn gently the patient’s head to the side from where the bleeding occurs.
2) **Fracture of the collar bone (Clavicle)**

This type of fracture usually occurs from a fall on the outstretched hand.

**Signs**

In addition to the usual signs of fracture the patient:

- Supports the arm on the injured side at the elbow with the other hand.
- Holds his head tilted to the injured side.
- Has crepitus which can be felt under the skin.

**Treatment**

- Place a pad in the armpit on the injured side.
- Pass a narrow folded bandage around each armpit to make a ring.
- Brace back the shoulders by a bandage on the back of the chest.
- Place the arm in a sling.
- Check the radial pulse.
- Refer to the primary health centre

3) **Fractured pelvis**

**Signs**

- Extensive bruising at the site of impact.
- Pain on pressing the pelvis.
- Inability to stand or move legs freely without pain.
- Watch for blood in urine (injury to bladder)

**Treatment**

- Place the patient in the most comfortable position, preferably with the legs and thighs outstretched.
- Tie the legs together.
- Fix the pelvis with a broad fold bandage.
- Treat for shock, if present.
- Transfer to the nearest Primary Health Centre.

4) **Fractured spine**

**Signs and symptoms**

- Pain in the back at the site of fracture.
- If the spinal cord is injured, the patient will complain of numbness, loss of sensation and inability to move the limb.

**Treatment**

- Lay the patient down flat on his back on a hard board.
- Bandage round the feet and ankles.
- Place pads under the neck, lumbar spine and behind the ankles.
d) Strap the patient to the board to avoid rolling during transport.

e) Transfer to the nearest Primary Health Centre as soon as possible preferably with the face down on a hard board with the head and shoulders supported by a pillow or folded blankets.

**Box 4.5: Principles to be followed for shifting the patient with fractured spine (Fig. 4.9)**

**Remember:**

A simple fractured spine may easily be turned into a complicated fracture involving the spinal cord unless the patient is carefully handled. The principles to be followed for shifting the patient with fractured spine are:

- The spine must not bend when moving or lifting the patient.
- Preferably do not turn the patient but if you have to, turn the patient in one piece.
- The stretcher on which the patient is being transported must be rigid so that it will not sag on lifting. Use a board, door, shutter etc for this purpose.
- Always transport the patient lying flat.

![Fig. 4.9: Transport the fractured spine patient with face down](image)

**Teaching the community about first aid measures for common fractures:**

As primary health care giver your task is to teach people in rural areas what immediate measures are to be taken if any person is met with a fracture at home, on the road or in the field and how to identify and manage the common fractures such as leg, arm and hand fractures.

**What is a dislocation?**

A dislocation is when the bone has come out from the socket. This also results in acute pain, swelling, an inability to carry any weight and an inability to move the injured limb. The first aid administered in case of a dislocation is also the same as in fracture. (Fig. 4.10)

![Fig. 4.10: Dislocation of shoulder joint](image)
Remember:
The word ‘RICE’ as a first aid treatment for all fractures, sprains and dislocations. 
RICE stands for Rest, Ice, Compression and Elevation.

- **REST**: Give plenty of rest to the immobilised limb. Move it as little as possible so that there is no strain.
- **ICE**: Apply ice to the injured area. No heat treatment or massage should be given. Use an ice pack or wrap up some ice cubes in a damp towel and apply it to the injured area.
- **COMPRESSION**: Wrap up the injured area with a crepe bandage if possible, or use any clean, fresh cloth available. Wrap it as tight as is comfortable.
- **ELEVATION**: The injured limb should preferably be raised above the level of the heart. This could be done with the help of a pillow while sleeping.

**Steps of First aid measures for:**
a) **Leg Fracture**: (Fig. 4.11)

Teach the following steps to the parents/family for taking care of victim with leg fracture:

![Fig 4.11 : Leg fracture](image)

1) If your child/family member has fractured his/her leg, carefully straighten it out.
2) Call for an ambulance.
3) Check for Bleeding:
   a) If your child/family member is bleeding, you should treat the bleeding first.
   b) Stop the bleeding by first cleaning it carefully with antiseptic/saline/clean water.
   c) Apply a clean dressing gently over the wound.
   d) Do not bandage tightly over the injury site.
4) In the meantime, secure the leg so that it doesn’t move at all.
5) Use any handy materials as splints to immobilise the limb. You could use a magazine or newspaper for support.
6) Apply two splints, one on the inner side from the foot to the inner thigh and the other on the outside, from the foot to the armpit. Secure the splints well.
7) You could even tie both legs together for added support.
8) Shift the patient immediately to PHC for further treatment.

b) **Hand / Forearm Fracture: (Fig. 4.12)**

- Teach the following steps to the parents/family for taking care of victim with fracture of hand or forearm:

1) If your child/family member has fractured his/her hand or forearm, carefully straighten it out.
2) Call for an ambulance.
3) Check first for Bleeding and follow the steps from (a) to (d) as given for the first aid treatment of leg fracture.
4) Move the hand gently to a 90-degree angle and keep close to the chest.
5) Immobilise the hand in the position given in Fig. 4.12.
6) Make a sling with the help of some cloth, a rope or shoe laces.
7) Shift the patient immediately to PHC for further treatment.

### 4.3.4 Wounds

The skin is normally intact, a break or the tear in the skin may occur following an accident which may result in a wound. The deeper the wound the more likely it is to get infected. The appearance of the wound and its likelihood of the infection depend upon the cause of the wound. The depth of the wound is more important than its area, small deep wounds caused by sharp instruments like knives, bullets, glasses and stones etc. are more dangerous.

**Causes of wounds**

A wound may be caused by:

a) A cut with sharp instruments like knives, bullets, glasses, stones etc.

b) A blow with a blunt instrument e.g. stick or hockey

c) A broken bone whose sharp end pierces the skin from inside, usually when an open fracture occurs. The degree of injury ranges from abrasion to a deep wound.
Assessment of patient with wound

When an injured person is brought to PHC, he/she may have more than one injury. As MLHP, your duty is immediately to assess and stabilise the condition of the patient as well as examine the condition and type of the wound. The assessment includes following steps:

1) Examining the condition of the patient for:
   • Airway
   • Breathing
   • Circulation

2) Asking History of cause for injury/wound

3) Identifying the type of wound, and

4) Checking the condition of wound for two important signs:
   • Bleeding
   • Infection

Management of patient with wound:

The aims of the first aid management are to:

a) To stop the bleeding from the wound.
b) To prevent wound from infection.

In order to achieve these aims, it is very essential for you to proceed with the following guidelines, while taking care of wound/wounds at your health centre.

Guidelines for taking care of wound

1) **Wash your hands very thoroughly with soap and water**
   This helps to avoid infection. Also put on disposable protective gloves if they are available.

2) **Stop the bleeding**
   Minor cuts and scrapes usually stop bleeding on their own. If not, apply gentle pressure with a sterile bandage or clean cloth and elevate the wound.

3) **Clean the wound**
   Use clear water to rinse the wound. Also clean around the wound with soap and a washcloth. Keep soap out of the wound, as it can cause irritation. If dirt or debris remains in the wound after washing, use forceps cleaned with alcohol to remove the particles. Thorough cleaning reduces the risk of infection. Use antiseptic such as betadine or hydrogen peroxide if the wound is infected.

4) **Cover the wound**
   Bandages can help to keep the wound clean and harmful bacteria out. If the injury is just a minor scrape, or scratch, leave it uncovered.

5) **Change the dressing**
   Do this at least once a day or whenever the bandage becomes wet or dirty. If the injured person is allergic to the adhesive in tapes and bandages, switch to adhesive-
free dressings or sterile gauze held in place with paper tape, rolled gauze or a loosely applied elastic bandage. After the wound has healed enough to make infection unlikely, you can leave it uncovered, as exposure to the air will speed healing.

6) **Get stitches for deep wounds**

A deep gaped or jagged wound with exposed fat or muscle will need stitches. Adhesive strips or butterfly tape may hold a minor cut together, but if you cannot easily close the wound, consult the doctor as soon as possible. Proper closure within a few hours minimises scarring and reduces the risk of infection. Refer in case you are not able to manage ar the earliest.

7) **Watch for signs of infection**

Consult the doctor if the wound is not healing or you notice any redness, increasing pain, drainage, warmth or swelling.

8) **Give tetanus toxoid injection**

If the injured person hasn’t had a tetanus toxoid injection in the past five years and the wound is deep or dirty, he or she may need a booster dose, as soon as possible.

**Types of wounds and their first aid treatment:**

1) **Abrasions**

An abrasion or graze is a scraping away of the superficial layer of the skin. (Fig. 4.13)

![Fig. 4.13: Discolouration is the hallmark of a bruise or abrasion](image)

**Signs**

i) Superficial scraping of the skin

ii) Slight bleeding

**First aid Treatment**

a) Wash the site with pre-boiled water or normal saline.

b) Remove any grit or other foreign matter.

c) Apply antiseptic lotion such as betadine.

d) Apply clean gauze covered with cotton wool padding and bandage.
**Follow-up**

Tell the patient to come for follow up as per following situations:

1)  If the abrasion is clean:
   a) See the patient in 5 days to remove the dressing.
   b) If the wound is dry, leave it open.

2)  If the abrasion is dirty and if he gets fever:
   a) Change dressing every 2 days until dry and clean.
   b) Clean it with antiseptic solution such as betadine.
   c) Apply clean gauze and antiseptic ointment such as soframicine.
   d) Give prescribed cap amoxicillin 500 mg 8 hourly for five days.
   e) Give a dose of tetanus toxide if patient has not received in the past five years.

2) **Incised wound (Fig. 4.14)**

An incised wound is caused by a sharp cutting instrument. Its edges are straight and it is usually accompanied by profuse bleeding, which helps to wash away any germs that might have entered the wound. A deep incised wound may cut through tendons and arteries.

![Incised wound](image1)

**Fig. 4.14 : Incised wound**

3) **Lacerated wound (Fig. 4.15)**

A lacerated wound is caused by a sharp irregular instrument. Its edges are ragged and bruising surrounds the wound. Usually lacerated wounds do not bleed much and any dirt which may have entered the wound is not thoroughly flushed out.

![Lacerated wound](image2)

**Fig. 4.15 : Lacerated wound**
4) **Punctured wound (Fig. 4.16)**

A punctured wound is caused by a stab from a knife, needle, nail, bullet etc and is often small and deep. There is usually little bleeding so that the germs and dirt introduced to the bottom of the wound by the stabbing instrument are not washed out. These wounds are likely to become easily infected and the risk of tetanus is high. Also, because of the depth of these wounds, injury to important structures may be caused.

![Fig. 4.16: Punctured wound](image)

**Signs**

a) The appearance of the wound edges depends on the cause of wound.

b) Bleeding is present to a varying extent.

c) Signs of shock (low BP, tachycardia, feeble pulse, fast breathing, cold and clammy skin, altered sensorium) may be present depending on the severity of the wound and the amount of bleeding.

**First aid Treatment**

The aims of the first aider when dealing with wounds are:

a) To stop bleeding

b) To prevent infection.

Start the first aid treatment as follows:

1) Handle the injured part as gently and as little as possible.

2) Sit or lay the patient down and raise the wounded limb.

3) Stop the bleeding.

4) Do not disturb the blood clots.

5) Do not remove any glass unless it is easily wiped away as its removal may open up a large blood vessel.

6) Treat for the shock (refer steps of shock management)

7) If the wound is large and will require suturing, apply a dry dressing and transfer the patients to the primary Health Centre, after applying a firm bandage to control the bleeding. Put the arm in a sling or immobilise the leg.

8) If the wound is small and you can deal with it at the sub-centre, proceed as follows:

   a) Sit or lay the patient down.

   b) Handle the injured part gently.
c) Clean the wound with pre-boiled water. Always clean away from, not towards the wound and remove foreign matter.

d) Stop the bleeding using direct pressure.

e) If the wound is small, apply antiseptic ointment/ lotion and cover with a clean dry dressing (Fig. 4.17)

![Fig. 4.17 : Applying antiseptic ointment with an applicator](image)

f) If the edges of the wound need approximation, use adhesive plaster to bring them together.

g) Apply a dry sterile dressing and bandage firmly. (Fig. 4.18)

h) Put the arm in the sling.

i) Treat for shock.

j) Give the patient a non-steroid anti-inflammatory medicine such as: ibuprofen to take home.

![Fig. 4.18 : Dressing and bandaging a small wound](image)

**Note:** If the wound is on scalp shave the hair around the wound before starting the treatment.
Follow-up

1) Tell the patient to come and see you after seven days.

2) If he develops fever or the dressing comes off, he should come to the sub-centre for a few dressings.

3) If the dressing stays on, he should have the dressing opened on the 7th day and the adhesive plaster removed. Apply a fresh sterile dressing for another three days. If the wound is healed, leave it open.

4) If fever develops, open the dressing, if dry:
   i) Apply a sterile dressing
   ii) Give paracetamol tablets.

5) If infected and moist, apply a clean dressing with antiseptic
   i) Give paracetamol tablets
   ii) Give prescribed amoxicillin capsules.
   iii) Change dressing every other day until clean.

All punctured wounds of the chest and abdomen after first aid should be referred to the doctor.

4.3.5 Minor Injuries

The children and young adults are more prone to minor injuries which can occur suddenly and can prove very serious, if not treated immediately. The first aid treatments for various common minor injuries are discussed below:

Sprains and Strains

A sprain is an injury to a ligament. It occurs when excessive or abnormal forces are applied around a joint.

Remember:
The ankle and knee joints are commonly affected by sprain.

Signs / symptoms

- Tenderness,
- Swelling,
- Bruising,
- Loss of function, and
- Joint instability (if it is a severe sprain).

Box 4.6 : Grades of sprain

The sprain can be simply graded into:

a) Grade 1: mild stretching of the ligament; no joint instability – (Mild Sprain)
b) Grade 2: partial ligament rupture; no joint instability – (Moderate Sprain)
c) Grade 3: complete ligament rupture; joint instability. – (Severe Sprain)
A strain occurs when a muscle is stretched or torn. It happens if a muscle is overstretched or has had forced strong contraction.

**Box 4.7: Degrees of strain**

a) A first-degree strain is when just a few muscle fibres are injured. There is tenderness and pain but normal muscle strength.

b) A second-degree strain is when a greater number of muscle fibres are injured with more severe pain and tenderness and possible bruising. Mild swelling and loss of muscle strength will also be present.

c) A third-degree strain is when the muscle tears all the way through, leading to total loss of muscle function.

**How can you tell if it is a fracture or a sprain/strain and what to do?**

- **In sprain or strain** the pain is less intensive than in a fracture and after a sprain, flexibility exercises followed by active mobilisation can be started as soon as pain allows (usually after few days or within a week).

- **In fracture** the patient will not allow to move the effected part at all. The movement is restricted by immobilising the part or limb usually for weeks.

**Therefore never make the mistake in underestimating your child’s pain and administer the same kind of first aid in both the cases.**

**Assessment of injury**

- Ask about the mechanism of injury, degree of pain and any self-treatment measures already applied.

- Assess the severity of the injury by examining for deformity, swelling, bruising, range of movement and ability to bear weight.

- Check for bony tenderness. It can be difficult to distinguish between a severe sprain and a fracture.

- Assess the degree of pain, which will help in determining the type of injury.

- Check for any nerve or circulatory disturbance.

- Ask about past medical history and current medication (including anticoagulants).

**First aid treatment**

Once the patient comes to your health centre withinjury. Remember the principles of ‘paying the PRICE’ and ‘avoiding HARM’ for the first 48–72 hours after the injury as follows:

i) **Pay–PRICE:**

- **Protection:** from further injury.

- **Rest:** for the first 48–72 hours after injury, activity should be avoided.

- **Ice:** a specialised ice pack wrapped in a cloth can be applied for 15–20 minutes every 2–3 hours for the first 48–72 hours after injury.

- **Compression:** helps to reduce swelling. An elastic bandage can be applied around the affected limb. Remove at night. Ensure that the bandage is not too tight.

- **Elevation:** as far as possible, elevate the injured area above the level of the heart for the first 48–72 hours, ensuring that it is comfortably supported.
ii) **Avoid HARM** for the first 72 hours after the injury:
- **Heat**: including heat packs or hot baths, this can increase bleeding.
- **Alcohol**: this can increase swelling and bleeding.
- **Running**: or other forms of exercise to immobilise the injured part or limb.
- **Massage**: this can increase swelling and bleeding.

iii) **Give** analgesics as needed.
- **Avoid** oral non-steroidal anti-inflammatory drugs (NSAIDs) for the first 48 hours after injury as there is some evidence that they may delay healing.

iv) **Refer to Accident and Emergency/secondary care if**:
- Recovery is slow or symptoms seem worse than the injury OR examination suspects.
- A fracture or dislocation.
- A complete or severe muscle tear.
- Nerve or circulatory damage.
- A known case of bleeding disorder.
- Signs of septic arthritis.
- Intramuscular haematoma.
- Joint locking.
- There is uncertainty about the diagnosis.

**Scraps and minor cuts:**

Scraps are commonplace injuries and involve damage to the top layers of the skin. They do not cause major blood loss but are often dirty because grazes tend to have debris embedded with them. (Fig. 4.19 and Fig. 4.20)
• Measures for taking care for scrapes and minor cuts at home:

You can teach the public to take care of scrapes and minor cuts at home by using a few simple measures which can help in natural healing and prevent infection. These measures are:

The patient is referred for medical assistance only if the bleeding does not stop, if there is a foreign object embedded in the wound or there is a serious risk of infection (e.g. rusty nail puncture or a dog bite).

1) Wash your own hands well before touching the injured area of the patient.
2) If the wound is dirty wash it under lightly running water or use antiseptic as per the directions.
3) Use a sterile dressing to avoid touching the wound directly and put gentle pressure on the area.
4) Elevate the wound, above the level of the heart, if possible, for example by supporting it on cushions. When bleeding has reduced clean the area and keep it dry.
5) Apply a sterile dressing over the scrape/cut.
6) Administer a dose of tetanus toxide injection.
7) Give analgesic such as Ibuprofen at once if patient has pain.

Burns and Scalds:

Burns and scalds are considered together as they produce the same type of injury. Burns are caused by dry heat, while scalds are caused by wet heat. Both are treated in the same way. Burns covering a large area or through deep layers of skin require hospital treatment but small burns will usually heal at home.

Causes:

a) Burns are caused from flames by:
   i) Fire, explosions of pressure stoves, petrol burns, hot metals, cigarettes etc.
   ii) Corrosive chemicals, e.g. strong acids and strong alkalis.
   iii) Electricity.

b) Scalds are caused by:
   1) Hot liquids such as: boiling water, tea, coffee, soup, steam, hot oil, tar, etc.

Types:

According to degree, burns and scalds can be classified into following 2 types:

i) **Superficial**: where the skin is partially destroyed;

ii) **Deep**: where the skin is completely destroyed and other structure such as muscles, bones, etc may also get destroyed.

The extent of the injury caused by a burn or scald depends on two factors:

a) The duration of contact between the skin and substance causing injury.

b) The strength of the substance. This is particularly importance when chemicals and electric currents are the cause of injury.
Signs and symptoms:

a) Superficial burns and scalds:
   i) The skin may be red or blistered, if the blister is broken, the skin is raw and wet but the underlying fat is not exposed.
   ii) Signs of shock.
   iii) Severe pain.

b) Deep burns and scalds: (Fig. 4.21)
   i) The skin is completely destroyed, exposing the fat and other deep tissues.
   ii) Signs of severe shock.
   iii) Severe pain.

First aid Treatment:

1) Superficial burns and Scalds:
   These are not extensive hence can be treated at the sub-centre or PHC.
   Proceed as follows:
   a) If the burn or the scald is fresh and the skin is covered with blisters (Fig. 4.22)
      i) Wash with clean water.
      ii) Apply soframycin ointment and cover with Vaseline gauze.
      iii) Dress with sterile gauze.
      iv) Take off the dressing after one week if
   a) If the skin is clean and dry, leave uncovered.
   b) If the wound smells and is wet, refer to the MO PHC.
   c) If the burn or scald is over 24 hours old and the skin is broken:
      i) Wash with clean water.
      ii) Remove any dirt present.
      iii) Apply soframycin ointment and apply Vaseline gauze.
      iv) Dress with sterile gauze.
v) Give prescribed amoxicillin capsule 500 mg 8 hourly for five days.
vi) Dress wound every 2 days until the skin is dry and clean.
vii) If the wound smells and is wet, refer to the PHC.

Fig. 4.22: Do not burst blister as this can lead to infection

Follow up: Give following instructions to patient during follow up:
i) Drink plenty of fluids.
ii) If the dressing is wet or falls off, come to the sub-centre immediately.
iii) If fever develops, come to the sub-centre immediately.

2) Deep burns and Scalds:
The main effects of deep burns and scalds are shock, pain and sepsis. Your efforts must be directed to deal with these three conditions. Proceed as follows:

Remember:
Children, weak and elderly persons are most affected by shock when burnt or scalded. The extent of skin burnt or scalded is very important in deciding the severity of shock, if one-third of the body is burnt death is likely to occur due to shock. Attention to shock is of vital importance in these cases.

1) Treat the shock as a first priority.
i) Lie the patient down.
ii) Keep the patient warm.
iii) Start I/V line with immediate fluid replacement (as prescribed by physician).
iv) Do not remove any clothing.
v) Check vital signs after every fifteen minutes.
vi) Check level of consciousness and look for cyanosis.
vii) Give I/V analgesic (inj. voveran)
viii) Give a dose of inj. tetanus toxide.
ix) Cover all exposed skin which is burnt with soframycin or sulfadiazine ointment or with Vaseline gauze. This will also reduce the pain and guard against infection.

2) Transfer the patient to the nearest hospital as soon as possible. Always transport the patient inlying down position.

You must always transfer patients with deep and extensive burns or scalds to the District hospital; also if these burns are not treated properly they will give rise to scarring and disfigurement on healing.

Teaching the community about Burn management at home

Minor burns such as superficial burns and scalds can be well managed at home. The following are the various instructions for taking care of burns in emergency which you can teach to the group of the people at the health centre or in the community. Tell them to proceed with the burns/scalds as follows:

1) As soon as possible flood the burnt area with cold water. Keep cooling with water for atleast 10 minutes.

2) Remove any jewellery or tight clothing as they may become stuck later if the area swells.

3) DO NOT break blisters or try to remove skin from the area.

Fig. 4.23: Cover the burnt area to prevent infection

1) Cover the burn with a sterile dressing. This is essential to protect the exposed injury from infection. If you do not have a dressing, clean plastic food bags may be used but DO NOT wrap them too tightly around the skin. (Fig. 4.28)

2) NEVER apply sticking plasters or adhesive tape directly to the skin, even around the burn as the burn may extend further than it first appears.

3) DO NOT use ointments or lotions of any kind.

4) Report to the doctor/sub-centre for further treatment.

Minor Head Injuries (Scalp Injuries): (Fig. 4.24)

There is a very rich blood supply to the scalp; hence the cuts to the head may often bleed copiously making them to appear worse than they actually are. However a head injury could represent a more serious underlying injury so careful observation and treatment is necessary.
The elderly and children especially need to be monitored for any changes in behaviour or sensorium after head injuries which may be the indication of trauma to brain tissue and need quick referral.

Fig. 4.24: Head injury causing brain trauma

The following immediate measures are taken to stabilise the patient with minor head injuries:

1) Apply gentle pressure to the wound with a sterile dressing or pad.
2) Bandage the dressing in place if necessary by a roller bandage around the head to keep pressure on the wound.
3) Give the patient a dose of tetanus toxoid injection.
4) Give tab. paracetamol 500 mg if necessary.
5) Lay the patient down with pillows or cushions under him/her to keep the head and shoulders raised above heart level.
6) Keep an eye on the patient for headache, nausea, vomiting drowsiness or loss of consciousness.
7) Record vital signs (BP, pulse, respiration, temperature) and level of consciousness every 2 hourly.
8) Send the patient to hospital, if bleeding is significant or there is a gaping of the wound or if unconsciousness or sickness occur.

Nosebleed:

Nosebleed can be common in children and in the elderly. It may occur following picking or blowing the nose or after a heavy cold as the blood vessels inside the nose are fragile.

When a patient comes with nose bleed, your aim in treating the nosebleed is to control the blood and keep the airway clear for breathing.
Measures to control bleeding are:

1) Make the patient to sit on a chair with his/her head leaning forward.

2) Do not let him/her lean the head backward as blood may run down his/her throat.

3) Pinch his/her nose on the fleshy part just below the bridge and apply pressure for 10 minutes. (Fig. 4.25)

4) Tell the patient to breathe through mouth and you may need to give her a towel or tissue to mop up blood or dribble. If he/she is a young child you can pinch his/her nose for applying gentle but firm pressure to both sides. This helps the blood vessels to contract.

5) When the bleeding stops, you can clean around the nose with lukewarm water or wipes. Blowing the nose should be avoided for the rest of the day as this may dislodge blood clots.

6) If the bleeding persists for longer than 30 minutes the patient should be taken to hospital, whilst keeping calm and sitting in the leaning forward position as much as possible.

Black Eye

Most black eyes are easily treated at home as long as the injury is just to the area around the eye and if there is no bleeding or direct injury to the eyeball. (Fig. 4.26)

First aid treatment:

Immediately give the first aid treatment (follow the same steps as mentioned for minor head injury) and refer the victim to the hospital if you see him/her suffering from any of the following conditions:

- Bleeding from the eyeball
- Loss of consciousness
- Two black eyes (especially if the injury was to a part of the head other than the face)
- Confusion
- Loss of vision or blurred vision
- Vertigo (dizziness)

Fig. 4.26: Victim with black eye after getting hit

4.3.6 Haemorrhage

What is haemorrhage?

Haemorrhage is the escape of blood from a blood vessel. It may be arterial, venous or capillary. The bleeding may occur externally which is visible through wound or internally into serous cavities (e.g. cranial, chest, abdominal or pelvic cavities).

How does the body stop bleeding?

When a blood vessel is torn or cut, a series of chemical reactions takes place that causes the formation of a blood clot to seal the injury. Components of the blood known as platelets clump together at the injury site. Damaged tissue and platelets release chemicals that activate proteins called clotting factors. These react with a special protein (fibrinogen) to form a mesh of filaments that traps blood cells. These form the basis of blood cells to fight infection and specialised blood cells that help promote repair and recovery. A scab will form to protect the wound until repair has taken place. When applying pressure to the site of a wound you are helping the clotting process.

Fig. 4.27: External Haemorrhage
What are the causes of haemorrhage?

- Internal bleeding may occur from an ulcer or tumour within the gastro-intestinal tract, stone or tumour in the urogenital tract, abdominal mass, injury to visceral organs, uterine bleeding, haemorrhage secondary to the coughing or vomiting up of blood.

- External bleeding can be caused by various injuries such as: scrapes, cuts, puncture wounds, nosebleed, pierced objects or amputation. (Fig. 4.27)

What are the Signs and Symptoms of haemorrhage?

- The patient may have various signs and symptoms depending upon cause and severity of haemorrhage, such as: bright red blood in cough, bright or dark red blood in vomit, vomit that looks like coffee, bright red blood or dark tar-like substance in faeces, haematuria (bright red blood in urine) rigid, swollen, or bruised abdomen, joint or bone and pain at the sight of bleeding.

- In severe haemorrhage the patient may have rapid, thready pulse, sighing respiration, thirst, cold and clammy skin, pallor, dizziness, syncope, apprehension, restlessness and low blood pressure (Shock).

What is the first-aid treatment for haemorrhage?

First aid for a bleeding victim is crucial. If you can slow or stop blood loss until the patient receives appropriate treatment, the patient’s chances of surviving increase considerably.

![Image of first-aid treatment](image)

Fig. 4.28: Control of venous bleeding by applying direct pressure

The first aid treatment will depend on the type of haemorrhage as follows:

i) Internal haemorrhage:

If there is severe internal bleeding which may occur from an ulcer or tumour within the intestinal tract or haemorrhage secondary to the coughing up of large quantities of blood, the patient should be placed in a lying–down position and transported as quickly as possible to a hospital.

ii) External haemorrhage:

If the wound is bleeding proceed as follows:

a) Place pressure directly on the wound by placing a sterile gauze dressing or a clean handkerchief on the bleeding points and pressing firmly with your gloved hand over dressing. Continue pressure until bleeding stops. (Fig. 4.28)

- Do not remove dressing. If soaked through, add more material, and continue pressure. If no broken bone suspected, elevate wound higher than level of heart.

- Do not move limb if you think it is broken.
b) If the bleeding is secondary to a very severe laceration in the arm or in the leg. Place the tourniquet just above the site of the injury. This should be applied only as a last resort if the bleeding cannot be controlled by direct pressure. (Fig. 4.29).

c) Check victim’s breathing. If breathing stops, see rescue breathing.

d) **Watch for shock (refer signs and symptoms of shock).** Keep victim lying down on their side or sitting up if more comfortable for victim, and cover lightly with blanket.

e) Do not give food or drink.

f) Shift immediately the patient to nearby hospital for appropriate treatment of severe bleeding in case of the cuts that are more than skin deep, cuts with ragged edges, cuts with deeply embedded dirt, impaled objects, or amputations.

**Box 4.8 : Some instructions for applying tourniquet (Fig. 4.30)**

1. A tourniquet must never be applied on the naked skin.

2. Tourniquet must be loosened every ten minutes to allow the circulation to return, otherwise the tissues will be deprived of blood and gangrene may result.

3. Always note the time when the tourniquet is applied.

4. A tourniquet should be applied as close as possible to bleeding site and just tight enough to stop the bleeding. If a tourniquet is applied too loosely, it will increase the amount of bleeding. If applied too tightly, it may unnecessarily damage tissues.

5. When a tourniquet has been in place for some minutes, it can be removed permanently soon after stoppage of bleeding.

6. A tight pressure dressing or tourniquet should never be applied in the region of the neck. The best way to stop bleeding from the neck is to constrict the bleeding vessel with fingers.
Don’t do the following:

- DO NOT apply a tourniquet to control bleeding, except as a last resort. Doing so may cause more harm than good. A tourniquet should be used only in a life-threatening situation and should be applied by an experienced person.

- If continuous pressure hasn’t stopped the bleeding and bleeding is extremely severe, a tourniquet may be used until medical help arrives or bleeding is controllable.
  - It should be applied to the limb between the bleeding site and the heart and tightened so bleeding can be controlled by applying direct pressure over the wound.
  - To make a tourniquet, use bandages 2 to 4 inches wide and wrap them around the limb several times. Tie a half or square knot, leaving loose ends long enough to tie another knot. A stick or a stiff rod should be placed between the two knots. Twist the stick until the bandage is tight enough to stop the bleeding and then secure it in place.
  - Check the tourniquet every 10 to 15 minutes. If the bleeding becomes controllable, (manageable by applying direct pressure), release the tourniquet.

- DO NOT try to clean a large wound. This can cause heavier bleeding.
  DO NOT try to clean a wound after you get the bleeding under control. Get medical help.

**Remember:**

- No haemorrhage from the scalp, the face or from one of the extremities usually looks much worse than they are, as most of these lacerations will stop bleeding by themselves within a few minutes. It is rare for someone to bleed to death from the extremity wound.

- **People who have haemorrhage should be transported** usually lying flat or with the feet elevated. This will tend to combat shock by causing blood to gravitate toward head.

### 4.3.7 Shock

It is a condition in which the circulatory system is unable to provide adequate circulation to the body tissues which results in the slowing of vital functions also called as circulatory failure. If untreated, this can lead to permanent organ damage or even death.

![Fig. 4.31 : Position of the patient in shock](image)
Classification of Shock. Shock is classified as given below:

- Hypovolemic shock
- Cardiogenic shock
- Distributive shock

**Hypovolemic shock:** It occurs due to loss of fluid, blood and plasma. e.g. burns, haemorrhage/bleeding, dehydration. It is the most common type of shock would represent a loss of 750 to 1300 ml of blood in a 70 kg person. Basically occurs due to blood loss, plasma loss and crystalloid loss.

**Cardiogenic shock:** It results from inability of heart muscle to function adequately or mechanical obstruction of blood flow to or from the heart.

Or occurs when the heart’s ability to contract and to pump blood is impaired and the supply of oxygen is inadequate for the heart and tissues. The causes of Cardiogenic shock are known as either coronary (Myocardial infarction) or non coronary (Cardiomyopathy, Valvular damage, dysrhythmias etc.)

**Distributive shock:** It is also known as vasogenic shock. Blood volume remains normal but the size of vascular space increases dramatically because of massive systemic vasodilatation.

- **Types of distributive shock:**
  1) **Anaphylactic shock:** It is caused by a severe allergic reaction when a patient who has already produced antibodies to a foreign substance (antigen) develops a systemic antigen-antibody reaction. Hypersensitivity reaction resulting in severe vasodilatation. Common sensitising agents are bee-stings, penicillin, snake venom etc.
  2) **Septic Shock:** It is a systemic response towards Infection caused by release of vasoactive substances like endotoxines of gram negative organisms like E. coli and Staphylococcus, Pneumococcus. Having high mortality rate.
  3) **Neurogenic Shock:** Vasodilatation occurs as a result of loss of sympathetic tone, caused by Spinal cord injury, especially cervical, Spinal anesthesia. Severe vasovagal reaction caused by pain or psychic trauma, Drugs causing vasodilatation e.g. lidnocaine, barbiturates, alcohol etc.

**Stages of Shock:**

1) **Initial stage** - Tissues are under perfused, decreased CO, increased anaerobic metabolism, lactic acid builds up.

2) **Compensatory stage** - Reversible, Sympathetic Nervous System activated by low carbon dioxide, attempting to compensate for the decrease tissue perfusion.

3) **Progressive stage** - Failing compensatory mechanisms: profound vasoconstriction results in ischemia and Lactic acid production that leads to metabolic acidosis.

4) **Irreversible or refractory stage** - Cellular necrosis and Multiple Organ Dysfunction Syndrome may occur.

**First-aid treatment**

Whenever you will find a patient in shock as evidenced by signs and symptoms, immediately proceed with the following steps:
In this article

1) Lay the person down, if possible
   - Elevate the patient’s feet about 12 inches unless head, neck, or back is injured or you suspect broken hip or leg bones. (Fig. 4.31)
   - Do not raise the patient’s head.
   - If the person vomits or begins bleeding from the mouth, turn him or her onto a side to prevent choking, unless you suspect a spinal injury.

2) Begin CPR, if necessary

If the patient is not breathing or breathing seems dangerously weak:
   - For a child, start CPR for children (Follow the steps of CPR as mentioned in drowning)
   - For an adult, start adult CPR. (Follow the steps of CPR as mentioned in drowning)
   - Continue CPR until the patient resume breathing.

3) Treat visible injuries

Follow the same steps as mentioned for the treatment of punctured wound.

4) Keep person warm and comfortable
   - Loosen tight clothing.
   - Cover with coat or blanket.
   - Keep the person still. Do not move the person unless there is danger.
   - Reassure the person.
   - Do not give anything to eat or drink by mouth.
   - Start I/V line for fluids/ emergency drugs.
   - Record and monitor vital signs (TPR/ BP and level of consciousness) every half hourly till patient becomes stable. (Fig. 4.32)
   - Transport the patient quickly to the nearest health care facility.
5) Referral

- Refer the patient immediately to nearby hospital for further treatment in case if patient’s condition worsens. (Fig. 4.33)

![Image](https://via.placeholder.com/150)

**Fig. 4.33 :** Transfer the patient with shock in stretcher after covering him/her in a blanket to prevent hypothermia

- At the hospital, the patient will be given oxygen therapy, blood transfusion/plasma expanders/life saving drugs in addition to intravenous infusion.
- Intravenous infusion is monitored according to a systolic blood pressure of 90–100 mmHg. in order to maintain perfusion of the vital organs.
- Blood test, urine test, cardiac functioning tests, X-ray and/or CT scan and other diagnostic investigations may be done to find the underline cause, as required.
- Other treatments will depend on the cause of shock.

### 4.3.8 Drowning

Drowning is the leading cause of injury-related death among children ages 1 to 4 and the second-leading cause of death in children 14 years of age and under. Young kids are especially at risk because they are curious, fast, and attracted to water but are not yet able to understand how dangerous it is.

**What happens due to drowning?**

Drowning results in the inhalation of water into the windpipe and lungs, clogging the lungs completely. The person who is drowning has the mouth and nose below the level of the water and therefore is unable to inhale any air every time he breathes. The lungs become full of water and air cannot enter them. (Fig. 4.34)

![Image](https://via.placeholder.com/150)

**Fig. 4.34 :** Drowning leads to complete immersion of nose and mouth into water

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Remember:
- Brain is quickly damaged by lack of oxygen which occurs when a drowned person is not inhaling any oxygen to circulate round the body.
- Damage to brain cells is irreversible so that a person may survive but be mentally crippled for life. The important of immediate action cannot be over-emphasised.
- Your first job therefore, is to give immediately artificial respiration to prevent brain cell damage from occurring.

Emergency care

The first priority after getting a drowned victim out of the water is quickly to assess his/her breathing. If he/she is not breathing, immediately begin rescue breathing and call someone for help. Do not assume it is too late to save a victim’s life, even if he/she is unresponsive and proceed for CPR as follows: (Fig. 4.35)

If your child is the victim of a near-drowning, this fast-action rescue plan can prevent a tragedy.

i) Clear the mouth of weeds or any other material obstructing air entry and of artificial teeth if any.

ii) Lay the patient on his back on a firm surface.

iii) Raise his shoulders on a folded coat or in some other way.

iv) Extend the head backwards to keep the air way clean.

v) Kneel down on both sides of the patients head.

vi) If necessary turn the patients head to one side to clear out the mouth.

vii) Grasp his wrists and cross them over the lower part of his chest.

viii) Rock your body forward and press down on the patient’s chests.

Fig. 4.35 : Steps of CPR for rescuing a drowning victim
ix) Release the pressure and with a sweeping movement draw the patient’s arms backward and outward as far as possible.

x) Repeat steps (vii. to ix) rhythmically twelve times per minute in an adult.

xi) Transfer the patient lying on the stretcher to the nearest PHC or hospital as early as possible. Continue giving artificial respiration on the way.

**Remember:**

In drowning the heart continues to function even when breathing has ceased for some time. Breathing may be started about an hour or more after artificial respiration is commenced.

**How to give CPR in different age groups?**

To open your child’s airway, gently tilt his/her head back with one hand and lift his/her chin with the other. Put your ear to the child’s mouth and nose, and look, listen, and feel for signs that he/she is breathing. (Fig. 4.36)

![Fig. 4.36 : Listening and feeling for victim’s sign of breathing](image1)

![Fig. 4.37 : Mouth to mouth breathing in adult](image2)
If the child doesn’t seem to be breathing, give mouth to mouth breathing as follows:

**Infants under age 1:**

Place your mouth over infant’s nose and lips and give two breaths, each lasting for about 1 second. Look for the chest to rise and fall. (Fig. 4.39)

**Children 1 year and older:**

1) Pinch child’s nose and seal your lips over her mouth. Give two slow, full breaths (each lasting for 1 to 2 seconds). (Fig. 4.37)

2) Wait for the chest to rise and fall before giving the second breath.

3) If the chest rises, check for a pulse (as explained in Sr. no : 4). If the chest doesn’t rise, try again. Re-tilt the head, lift the child’s chin, and repeat the breaths.

4) Check for a pulse. Put two fingers on the child’s neck to the side of the Adam’s apple (for infants, feel inside the arm between the elbow and shoulder). Wait five seconds. If there is a pulse, give one breath every three seconds. Check for a pulse every minute, and continue rescue breathing until the child is breathing on her own or help arrives.

If you can’t find a pulse, give cardiac compression as follows:

- **Infants under age 1:**

Imagine a line between the child’s nipples, and place two fingers just below its center point. Apply five half-inch chest compressions in about three seconds. After five compressions, seal your lips over your child’s mouth and nose and give one breath.

- **Children 1 year and older:**

Use the heel of your hand (both hands for a teenager or adult) to apply five quick one-inch chest compressions to the middle of the breastbone (just above where the ribs come together) in about three seconds. After five compressions, pinch the child’s / adult’s nose, seal your lips over his mouth, and give one full breath. (Fig. 4.38)

![Fig. 4.38: Technique of cardiac compression in adults](image-url)
Fig. 4.39: Technique of mouth breathing in child

- **All ages:** Continue the cycle of five chest compressions followed by a breath for one minute, then check for a pulse. Repeat cycle until you find a pulse or help arrives and takes over.

**Educating the community how to prevent the hazards of drowning?**

In rural areas the people especially young children are more vulnerable to drowning likely due to availability of pools, wells, tanks etc. as well as the children have more attraction for water. As community health nurse practitioner, it is you essential duty to safeguard the public especially parents and children about various hazards of drowning. For example:

1) Do you know that a small child can drown in as little as one to two inches of water, which is just enough to submerge his/her mouth and nose? Be sure that child is protected from these danger zones in your home, yard or field.

2) Never leave a child under four years alone in the tub or near a running bath. A school age child can bathe by himself/herself but a parent should stay within reach.

3) Never leave your child unattended in a bath seat, he/she could slip down into the water and get trapped underneath, or the ring could tip over.

4) A curious toddler can fall headfirst into a water filled bucket and be unable to get out. Even a cooler filled with melting ice can be a drowning hazard. Always make sure to empty after use.

5) Keep toilet cover down and bathroom door closed at all times. Install a toilet cover safety bolt.

6) Empty child size pools after use and store on their sides.

7) Pools are a lot of fun but they can also be dangerous, especially for children. In fact, the majority of drowning occurs at residential pools. A child is at risk when he is inadequately supervised or when adults or the child himself overestimate his swimming ability.

8) Install a high (atleast five feet) fence around all sides of the pool that separates it from the play area, with a self-closing gate.

9) Keep rescue equipment e.g. pole, rope, stick etc. near the pool with in an easy reach.
10) Never take your eyes off your child when he/she is in the pool area.

11) Keep the area around the pool clean and do not leave toys in or around it, because they could attract children to the water.

12) Keep the pool covered when it is not in use.

13) Make sure the cover fits securely over the pool’s entire surface. Otherwise, a child may get under it and become trapped.

14) If your child is missing, check the pool first, since children can be drowned in only a few minutes. Go to the pool’s edge and scan the entire surface.

15) Teach your child to swim with a companion at all times, even if he is in the water with a large group of children and adults.

16) Do not let kids jump or dive into a lake, pond, or river until an adult has checked the water’s depth (it should be at least nine feet) and looked for underwater hazards that may be hard to see.

17) Do not allow the children to stride in pools, streams or other water collections alone if they are not able to swim.

18) Do not stand on the parapet of open wells while drawing water.

19) Never let a child swim near boats or fishermen. Always stay in supervised swimming areas within sight of a lifeguard.

20) On boating trips, everyone should wear a life preserving jackets.

4.3.9 Surgical Trauma

What is surgical trauma?

Surgical Trauma is a term which refers to physical injury of sudden onset and severity which require immediate surgical treatment. The insult may cause systemic shock called “shock trauma”, and may require immediate resuscitation and interventions to save life and limb.

What are the causes of trauma?

Traumatic injuries are the result of a wide variety of blunt, penetrating and burn mechanisms. They include motor vehicle collisions, sports injuries, falls, natural disasters and a multitude of other physical injuries which can occur at home, on the street, or while at work and require immediate care.

What are the types of trauma?

The traumas are classified according to its severity into moderate, serious, severe and critical type, in various body regions such as: traumas of head, neck, face, thorax, abdomen, pelvis, and extremities.

First-aid treatment for trauma

When a trauma patient reports to you, proceed with the following steps:

- Assess the trauma patient for life-threatening problems such as: airway obstruction, breathing difficulty, bleeding, shock and infection by evaluating the patency of airway, breathing and circulation.

- Initiate resuscitative measures for securing the patency of airway, facilitating breathing, stopping bleeding and preventing shock and infection. (Follow the
steps as discussed under CPR, first treatment of haemorrhage, shock and wound.)

- Perform a thorough head-to-toe examination, paying attention to evidence of the mechanism of injury and potentially injured areas.
- Control external bleeding with direct pressure and watch for internal bleeding.
- Start intravenous line for administering IV fluids/emergency drugs or blood if needed.
- Watch for signs and symptoms of shock (refer S/S of shock).
- Treat the shock before shifting. (refer the first aid treatment of shock)
- Initiate prompt transport of the patient to specialty care hospital. The injured patient is at risk for progressive deterioration from continued bleeding and requires rapid transport to a trauma center with appropriate stabilisation procedures to be performed on the way of transportation.

**Treatment in hospital**

On reception of injured patient following immediate measures are taken to save the life of the patient:

- Endotracheal intubation is done to secure the airway of the patient who is unable to maintain the airway or who has potential airway threat.
- Airways secured with in-line of cervical immobilisation in the patient who may have suffered cervical trauma.
- Artificial ventilation is provided for patients who exhibit severe respiratory problem.
- Oxygen saturation is maintained at more than 90–92%.
- External bleeding is controlled by applying direct pressure above the site of wound.
- Intraperitoneal haemorrhage is assumed if haemorrhagic shock is found in the absence of external haemorrhage.
- Vital signs and level of consciousness are recorded and monitored after every half hourly.
- If the patient is found haemodynamically unstable after administration of 2 liters of fluid in an adult patient, it indicates ongoing blood loss and is an indication for immediate blood transfusion. In emergency type O, Rh-negative blood can be administered if cross-matched blood is not available.
- The fluid loss is replaced with crystalloid solution (such as: Normal saline and Dextrose saline) and Ringer lactate solution is administered to patients with evidence of shock.
- Intravenous infusion is monitored according to a systolic blood pressure of 90–100 mmHg, in order to maintain perfusion of the vital organs.
- A complete spinal immobilisation of patients with multisystem injuries or of the patients who are potential for spinal cord trauma is ensured.
- Further investigations are carried out such as: contrast-enhanced CT scan of the head, spine, abdomen and pelvis and ultrasonography to find out the cause, type, site and severity of injury.
- Depending upon the cause, type, site and severity of trauma as well stability of the patient, surgical treatment is initiated.
4.4 LET US SUM UP

In this practical we have discussed the meaning, causes and signs and symptoms of various Common Emergencies such as: high fever, diabetic coma (hyperglycemic shock) and insulin shock (hypoglycemic shock), fracture, wound, minor injuries, haemorrhage, shock, drowning and other surgical traumas.

We have also described the First Aid measures for managing and stabilising the conditions of the patients with these emergencies. Certain new terms are clarified in glossary. You may use a medical dictionary for further clarifications of terms. However, further reading is solicited to keep you updated for which certain references are given.

4.5 ACTIVITY

1) Assess causes and signs/symptoms of the 3 patients with high fever, diabetic coma and insulin coma, different types of (fractures, wounds, minor injuries, haemorrhage), shock, drowning and surgical traumas as mentioned in the practical.

2) Practice the steps of First Aid measures on 3 patients with high fever, diabetic coma and insulin shock, different types of (fractures, wounds, minor injuries, haemorrhage) shock, drowning and surgical traumas as mentioned in the practical.

4.6 KEY WORDS

Amputation : Surgical removal of apart of body or limb.
Antiseptic : An agent applied on wound for preventing infection by inhibiting the growth of infectious agents.
Assessment : It includes health history and physical examination of the patient.
Autoimmune : Cellular response for development of auto-antibodies.
Auto-antibodies : An abnormal immune substance produced in blood which destroys its own body cells.
Bruise : A yellow or bluish discolouration of the skin caused by blow to the body.
Cyanosis : Bluish discolouration of skin or mucous membrane.
Confusion : Disorientation to time, place and person.
CPR : Cardio-pulmonary resuscitation
CT : Computed tomography (An x-ray technique that produces a film representing a detailed cross section of tissue structure)
Dizziness : Laziness.
Drowsiness : The state of almost falling asleep.
Dyspnoea : Difficulty in breathing.
Endo-tracheal intubation : Insertion of airway catheter through the mouth or nose into the trachea
Immobilisation : Restriction of movements
Skills for Management of Common Conditions and Emergencies

**Haemodynamic**: Related to cardiac function and peripheral vascular physiology.

**Hypothermia**: A dangerous fall in temperature below 35°C or less.

**Inflammation**: A protective response of the body tissues to irritation or injury.

**Irreversible**: Which cannot recover.

**Metabolism**: The process of transforming food stuffs into tissue elements.

**Oedema**: Accumulation of fluid in subcutaneous tissues.

**Rigor**: A violent attack of shivering associated with chills and fever.

**Seizure**: A sudden violent involuntary series of contraction of a group of muscles.

**Sensorium**: The consciousness that includes orientation of time, place and person.

**Syncope**: A brief lapse in consciousness.

**SOS**: If necessary

**Stat**: At once

**Tumour**: A new growth of tissues

**Ulcer**: A circumscribed depressed lesion on the skin or mucous membrane.

### 4.7 REFERENCES


