

# Unit 4

## First Aid



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### Precaution...

Students to function as First Aider only after training.

### INTRODUCTION

In this unit, you will learn about the various facilities, equipment and materials used for First Aid. First Aid facilities must be located in accessible places.

First Aid is the first assistance or aid or treatment given to a patient in an emergency situation before formal and appropriate medical help is available. Any trained person or paramedical staff at any point of time can render First Aid services. An ambulance must also be stationed at a workplace to tackle emergency situations. The purpose of giving first aid is to prevent further deterioration of the patient's health. The responsibility of a First Aider is to help the patient by winning her/his confidence. At the same time, the First Aider must not endanger her/his own life while providing treatment. S/he must always keep in the mind that the casualty may have more than one injury.

When a person suffers an injury or sudden illness, immediate medical attention or treatment may be provided to her/him in order to reduce the discomfort, pain and deterioration of her/his condition. During these situations, trained doctors may not be available on the spot. Therefore, the 'first care', which is provided before professional medical help is available, is called 'First Aid'. As a trained GDA, it is necessary to understand

the principles and procedures for providing First Aid while awaiting the arrival of 'Medical Aid'.

This unit also describes the principles and rules of First Aid, identifying facilities, equipment and materials for First Aid and performing the role of a First Aider in fever, heatstroke, back pain, asthma and food-borne diseases.

## SESSION 1: PRINCIPLES AND RULES OF FIRST AID

In this session, you will learn about the principles and rules of First Aid. This session explains the purpose, principles and general rules of basic First Aid. First Aid means initiating life support treatment for people suffering from an injury or sudden illness. We have to understand that First Aid has its own limitations and cannot be substituted for professional medical treatment. Assistance given by a First Aider helps in saving the life of a patient. The International Organisation for Standardisation (ISO) specified symbol for First Aid is a symmetrical white cross on a green background.

### Purpose of First Aid

The primary purpose of giving First Aid is to sustain the life of a person before the arrival of a qualified medical expert, reduce her/his discomfort due to pain, help in early recovery and prevent her/his condition from worsening.

### Principles of First Aid

The basic principles of First Aid are as follows:

- (i) *Preserve life*: This includes preserving the life of the casualty and the rescuer.
- (ii) *Ensure protection of the casualty from further harm*: The treatment area needs to be safe and must not have excess people.
- (iii) *Provide pain relief*: This includes the use of ice packs or applying a sling.
- (iv) *Prevent the condition from worsening*: Ensure that the First Aid procedures do not worsen the patient's condition.



Fig. 4.1 First Aid symbol



## Rules of First Aid

- **Check:** Find out what has happened and what is wrong with the person. Comfort the person and arrange for a shelter.
- **Call:** Arrange for a professional medical aid.
- **Care:** Help the victim, preferably without moving her/him.

## Health emergency

'Health emergency' is a situation, wherein there is a danger or risk to the health of a person because of sudden illness or accident, and immediate help is required to save a life. Immediate attention and First Aid must be provided to the person in case of an emergency before medical help arrives. The various situations that require immediate medical care are — electric shock, breathing difficulty, burns, bleeding, injury, fracture, heart attack, etc.

## The human body

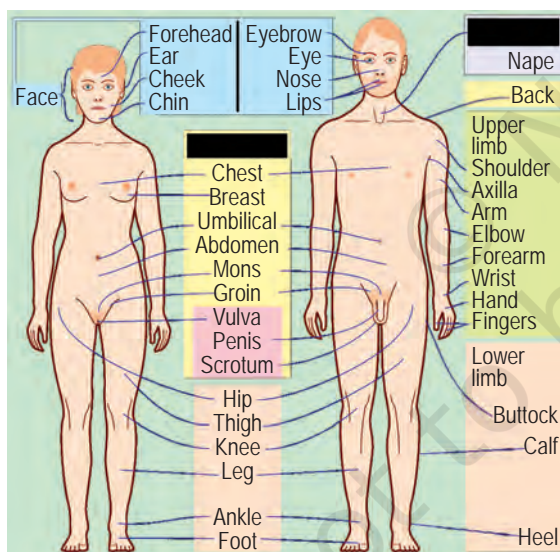


Fig. 4.2 Human body

Various parts of the human body work together simultaneously to perform a number of tasks. The body by adulthood consists of close to 100 trillion cells, the basic unit of life. These cells are organised in a systematic manner to form the whole body, having various body systems. A newborn has over 300 bones at the time of birth, whereas, an adult has 206 bones. The body includes various systems, such as musculoskeletal, cardiovascular, digestive, endocrine, integumentary, urinary, lymphatic, immune, respiratory and reproductive. We will now understand two vital aspects of life from the point of First Aid.

## Breathing

Breathing is vital for life. A person breathes about 20,000 times a day. The breathing process is carried out by the respiratory system, which includes nose, throat, voice box, windpipe and lungs. We inhale air through the nose



or mouth that meets at the pharynx or throat, located at the back of the nose and mouth. The diaphragm that separates the chest from abdomen moves up and down when we inhale and exhale. When we breathe in, the diaphragm moves down to enlarge the chest cavity to fill in maximum air. When we breathe out or exhale, the diaphragm moves up, forcing the chest cavity to push out gases in the lungs through the nose and mouth.

In case of tongue fallen backwards, blocking the airway, it is necessary to hyper extend the head and pull up the chin, so that the tongue lifts and clears the airway.

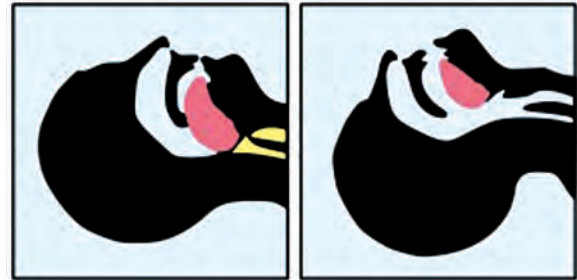


Fig. 4.3 First Aid for breathing problem

## Blood circulation

Blood consists of plasma, red blood cells, white blood cells and platelets suspended in viscous medium. The heart, the main pumping organ of the circulatory system, is made of muscles. It is located between the two lungs slightly inclined towards the left. The pointed tip at the bottom of the heart touches the front wall of the chest each time the heart beats, producing a sound. You can also listen to heartbeats. When the heart contracts, it pushes blood out into two major loops or cycles — systemic loop and pulmonary loop.

The blood reaches the body's systems by circulating oxygen to all organs, structures and tissues, and collecting carbon dioxide through the systemic cycle. The pulmonary loop helps in the oxygenation of blood. It circulates blood to and from the lungs, to release carbon dioxide and carry oxygen to the tissues. The systemic cycle and pulmonary cycle control the left and right side of the heart, respectively.

## Health and safety risks at workplace

The probability of a person to experience an adverse health effect if exposed to a hazard is considered as a risk factor at work. Let us now learn about the various types of hazards and their causes. This will help us to identify the various hazards that one may encounter at a workplace.

## Types of hazards

### **Biological**

Biological hazards are caused by living organisms, like bacteria, viruses, insects, plants, birds, animals, humans, etc.

### **Chemical**

Chemical hazards include those caused by acids, poisons, cleaning agents, etc. These depend on the physical and toxic properties of a chemical. The severity of a hazard depends on the toxic properties of the chemical.

### **Radiation**

Radiation hazards are related to exposure to radiations from radioactive substances.

### **Ergonomic**

Ergonomic hazards are caused due to same posture and movements for a long time, improper layout of workstation (e.g., computer workstation, workstation for repair of electrical gadgets, etc.), faulty chairs, tools and equipment, etc. Wrong postures also cause fatigue, back pain, and discomfort in shoulders and lower limbs.

### **Physical**

These hazards are caused due to slippery surfaces, falling objects, manual handling (lifting, pushing, carrying), sharp tools and equipment, radiation, magnetic fields, extreme pressure (high pressure or vacuum), excessive loud and prolonged noise, and bullying (abnormal, repeated behaviour directed against a worker or group of workers, causing health and safety risk). These may cause stress, depression, loss of self-esteem, feeling of guilt, phobias, sleeping and eating disorders, etc.

### **Psychosocial**

Psychosocial hazards are caused due to violence, excessive pressure or stress at workplace for meeting deadlines, conflicts at workplace, etc. It also includes hazards due to discrimination on the grounds of caste, race, skin colour, ethnic origin, sex, religion, etc.





## Safety

Safety hazards at a workplace include slipping or tripping, inappropriate machine guarding, collision, bumps, road and fire accidents, equipment malfunctions or breakdown, and electrical accidents (it can cause burns, affecting areas in contact with the current).

### Practical Exercise

1. Visit a hospital and find out the First Aid measures adopted.
2. Find out the steps taken by the administration to provide First Aid in case of an emergency in your school.
3. Visit a nearby hospital and observe the various hazards. List the common hazards that you notice in the table given below:

Type of hazards	Places prone to hazards in hospital
Biological	
Chemical	
Radiation	
Ergonomic	
Physical	
Psychosocial	



Fig. 4.4 Types of hazards

## Check Your Progress

### A. Fill in the Blanks

1. Medical attention given at the first instance is called \_\_\_\_\_.
2. The ISO specified symbol for First Aid is a \_\_\_\_\_ on a green background.
3. Blood is a viscous fluid composed of \_\_\_\_\_.
4. The process of breathing in is \_\_\_\_\_ and breathing out is \_\_\_\_\_.

### B. Short Answer Questions

1. What is the purpose of First Aid?
2. State the principles of First Aid.
3. What is a health emergency? Describe various emergency situations.
4. Explain the rules of First Aid.



## SESSION 2: IDENTIFY FACILITIES, EQUIPMENT AND MATERIALS FOR FIRST AID

This session explains the various facilities, equipment and materials used for First Aid. First Aid facilities and ambulance service must be available at a workplace to meet emergency situations.

Ambulance is a vehicle that transports critically sick or injured people to a medical facility. Ambulances are motor vehicles, which may be a helicopter, airplane, or even a boat. The interior of an ambulance can accommodate one or more patients and emergency medical personnel. It consists of supplies and equipment to stabilise a patient's condition en-route a hospital.

An organisation or educational institution provides First Aid facilities, such as a First Aid room, First Aid kit, health centre and First Aid equipment in the premises to meet emergency situations. One or two personnel, trained in administering First Aid to casualties known as First Aiders, must be appointed at a workplace. Now, let us understand the facilities and important aspects that must be kept in mind when arranging for these facilities.

### First Aid room

It is the place where equipment and materials are arranged systematically for providing First Aid services. A First Aid room must have the following:

- a nameplate with the symbol of First Aid
- adequate lighting and ventilation facility
- toilets, which should be friendly for differently abled persons
- facilities for the easy movement of a person on a stretcher or wheelchair

The other facilities in a First Aid Room include:

- table and chairs
- a telephone
- a directory containing emergency telephone numbers (e.g., in India, telephone number for fire service station is 101, for police it is 100 and for emergency services or ambulance it is 108)



- first aid kit
- examination lamp
- medical examination couch with blankets and pillows
- a portable screen
- a container for storing sharp equipment, like surgical knives, etc.
- sink and washbasin with hot and cold running water
- steriliser
- stretcher
- work bench or dressing trolley
- oxygen cylinder
- sphygmomanometer—blood pressure measuring instrument
- resuscitation equipment
- cupboards for storing medicines, dressings and linen
- electric power points
- seating arrangements
- container for soiled dressings
- medical waste containers

### First Aid kit

A First Aid kit consists of items for providing First Aid in case of bleeding, fractures and burns. A First Aid kit can also be made industry or organisation specific (nature of the job being undertaken at an industry or organisation). For example, in casting and forging industries, medicines used in burns and scalds must be kept in the First Aid kit. A basic First Aid kit must include the following:

- band-aids of all sizes
- 4" by 4" gauze pads for cleaning wounds.
- 4" by 4" dressing bandages for wounds, cuts and abrasions
- 2" dressing rolls or crepe bandage for covering and bandaging injuries
- medical tape
- cotton balls
- safety pins
- alcohol pads or isopropyl alcohol for cleaning wounds







- Tourniquet bandage (compression bandage), if bleeding persists with pressure for more than 15–20 minutes
- sling, a bandage used to rest an injured forearm; it is a wide triangular piece of cloth used to support the hand from around the neck
- splint, orthopaedic mechanical device used to restrain and protect a part of the body in case of a fracture (such as a broken leg or hand)

## Drugs for common ailments

There are a number of common ailments from which people may suffer. These ailments are, generally, not serious in nature and can be cured by home remedies or over-the-counter medicines. Many common illnesses are treated at home using non-prescribed medicines. Some ailments are serious in nature and require professional medical attention. Even common cold can become serious, if not treated correctly and timely as it can advance to other infectious diseases, such as influenza and pneumonia. If ailments persist for few days, the patient must immediately consult a doctor.

Some of the drugs, generally, prescribed for common ailments are given in the table below.

Ailments	Drugs
Allergies	Cetirizine tablet
Headache	Saridon, Aspirin (also used for chest pain)
Heartburn or acidity	Digene tablet or syrup
Nasal congestion	Vaporub for rubbing on nose and chest
Cough and cold	Tablet for cough and cold or syrup
Fever or flu	Paracetamol (also used as a general painkiller)
Constipation	Isabgol husk (with hot milk or water)
Sprains and strains	Flexon or Combiflam tablet (used as an anti-inflammatory painkiller)
Dehydration	Oral Rehydration Salt (ORS)



## Practical Exercise

Prepare a First Aid kit with all equipment and materials.

### Check Your Progress

#### A. Fill in the Blanks

- \_\_\_\_\_ is a vehicle specifically designed to transport critically sick or injured people to a medical facility.
- \_\_\_\_\_ is an electronic device that administers an electric shock of preset voltage to the heart.
- \_\_\_\_\_ is a bandage used to support an injured forearm.
- A \_\_\_\_\_ is someone who takes charge of an emergency scene and administers First Aid.
- ORS stands for \_\_\_\_\_.
- \_\_\_\_\_ is the place where equipment and materials are systematically arranged for First Aid services.
- The contents of the \_\_\_\_\_ kit are mainly meant for providing First Aid.

#### B. Short Answer Questions

- Describe the First Aid room and the facilities it offers.
- Describe First Aid kit and enlist its contents.
- What are drugs for common ailments? Enlist few drugs.

### SESSION 3: PERFORMING THE ROLE OF FIRST AIDER FOR FEVER, HEATSTROKE, BACK PAIN, ASTHMA AND FOOD-BORNE ILLNESS

This session will make you understand the role of a First Aider in handling people suffering from heatstroke, back pain, asthma and food-borne illness. A First Aider is a person who undertakes an emergency situation and administers the First Aid. Often, the First Aider at an emergency scene is a passerby, willing to help. A parent, who helps her/his child, a firefighter attending to an injured pedestrian, or an employee, who provides care, are all providing First Aid. A First Aider does not



diagnose or treat injuries and illnesses but offers help to the person in need.

This session describes how to administer First Aid to a person suffering from fever, heatstroke, back pain, asthma and food-borne illness. As a First Aider, the first thing is to manage the situation and stay in charge until the arrival of medical help or ambulance. Before the arrival of medical help or ambulance, many people may offer to help and crowd the place. In an emergency situation, where there is confusion and fear, a trained and effective First Aider reassures everyone and can make the whole experience less traumatic. Besides giving First Aid, one must ensure the following:

- manage unnecessary crowd
- protect the casualty's belongings

### General considerations and rules

The elementary life-saving procedures are head tilt, First Aid at choking and recovery position. Now, let us imagine that a person has met with an accident. The services of priority that the First Aider needs to follow in an emergency situation like this are as follows:

#### Step 1

*Check for bleeding:* Stop bleeding by applying direct pressure on the wound area.

#### Step 2

*Check for head, neck and spinal injury:* If any of these are suspected, immobilise a victim to prevent further injury. Moving the victim will often increase the impact of spinal injuries.

#### Step 3

*Determine responsiveness:* If the victim is unconscious, try to arouse by gently shaking and speaking with her/him. Do not give fluid, the victim cannot swallow and can even choke. Check for her/his chest movements and listen to sounds of breathing (place your ear near the victim's nose and mouth and feel for breath on your cheek). If the victim is not breathing, then



mouth-to-mouth resuscitation is to be given. If you are not trained to do that, seek medical help at the earliest.

If the victim is breathing but unconscious, roll her/him on one side, keeping the head and neck aligned with the body. This will help drain the mouth and prevent the tongue or vomit from blocking the airway. If the victim remains unresponsive, carefully roll the person on the back and open the airway.

- Keep the victim's head and neck aligned.
- Cautiously roll onto the back while holding the head.
- Open the airway by lifting the chin.

### Observe ABC

#### Basic life-saving steps

Ref: AFH 36-2218, Vol 1, Vol 2

Use extreme care when treating injuries in a contaminated environment.

Different rules may apply!



Head tilt, chin lift.

#### Immediate steps

When a person is injured:

- Establish an open **Airway** (if possible neck injury, ensure airway is opened using the jaw thrust maneuver; do not turn the head)
- Ensure **Breathing**
- Stop bleeding to support **Circulation**
- Prevent further **Disability**
  - Immobilise neck injuries
  - Place dressings over open wound
  - Splint obvious limb deformities
- Minimise further **Exposure** to adverse weather

**A** Airway  
**B** Breathing  
**C** Circulation  
**D** Disability  
**E** Exposure

A → Airway

B → Breathing

C → Circulation

#### Airway

Ensure that the tongue or any foreign body does not obstruct the airway.

#### Breathing

Make sure the victim is breathing. If you are trained to give mouth-to-mouth respiration, then facilitate breathing.

#### Circulation

Check for the pulse to ensure that the heart is beating normally. Check the heartbeat or pulse of the victim. If there is no pulse and you are trained to do Cardio Pulmonary Resuscitation (CPR), then begin CPR immediately. (Note: CPR is administered when both the heart and lungs have ceased to function)



Fig. 4.7 CPR First Aid

### Step 4

*Call emergency services:* Call for help or ask someone else to do so as soon as possible. If you are alone, try to establish breathing before calling for help and do not leave the victim unattended for long. Stay calm and



do not give up. Continue administering First Aid to the victim until medical help arrives.

Let us now learn about the basic First Aid practices that may be executed by the First Aider to provide First Aid to people working in various occupations, with special reference to the health sector. Considering your age and body strength, we will take up only those First Aid practices that can be performed easily.

### ***Fever***

Fever is higher than normal human body temperature (normal body temperature is 37° C or 98.6° F). Body temperature is a good indicator of a person's health. Fever is a symptom and not a disease. Fever can be categorised as given below:

- Low fever: 98.8° F to 100.8° F
- Mild to moderate: 101° F to 103° F
- High fever: 104° F and above. If the temperature is high, then it is a sign that the body is fighting illness.

### ***Causes***

Fever may be caused due to hot weather, bacterial or viral infections, spending too much time under the Sun or allergies due to medication, food or water.

### ***Symptoms***

Symptoms may include hot flushed face, nausea, vomiting, head and body ache, constipation and diarrhoea.

### ***First Aid***

Monitor the temperature using a digital thermometer. Remove the excess clothing. Keep the person in a cool place, and if required, give a sponge bath in tap water. Give plenty of fluids and prescribed dose of Paracetamol tablet.

### ***Taking body temperature***

In case of fever, body temperature is measured using a thermometer. Let us now learn how to take the body temperature.

#### **Step 1: Prepare**

Wash the tip of the digital thermometer with clean water and wipe it with a clean cloth. Wipe it with a tissue





## NOTES

paper after cleaning the surface. This will remove germs on the surface.

### Step 2: Switch on

Check the power button by switching on the digital thermometer to ensure that it is working. The LCD screen must read '0'. If the screen remains blank, replace the battery. Read the instructions given in the manual to replace the battery. Use the thermometer when the initial reading is correct.

### Step 3: Position

Place the thermometer in the mouth of the person by putting its tip at the centre at the back of the tongue before asking the patient to close the lips around it to hold it.

### Step 4: Take temperature

Press the button to make the appliance read the temperature. This can take few minutes. Remove the thermometer from the person's mouth and read the temperature.

### Step 5: Store

After you have finished using the thermometer, switch it off and clean the tip with water and wipe it with a tissue paper or dry cloth. Keep the thermometer in its protective case and store it at a safe place, away from the reach of children.

## **Heatstroke**

Heatstroke is a severe heat-related condition and can even be life-threatening. It is caused when the body's cooling mechanism fails due to excessive heat and humidity. Impairment in sweat gland function may be another cause of heatstroke.

### *Symptoms*

In heatstroke, the body temperature is more than 104° F. Fever may cause headache, dizziness, fatigue, fluctuating blood pressure and irritability.

### *First Aid*

Shift the person to a cool place. Cool the person by sponging her/him with a wet towel. Apply ice packs in armpits and groin. Give lukewarm water with electrolyte.



**Back pain**

Back pain is acute pain in the back of the body. The pain, generally, persists for a short duration. It indicates that the body is under stress. It is caused due to problems in bones, ligaments and muscles of spine and nerves.

*Triggering factors*

Back pain may be aggravated because of poor posture, inappropriate footwear; incorrect walking habit; prolonged sitting; sleeping on soft mattresses; kidney, bladder prostate disorders; constipation, stress, etc.

*First Aid*

Massage with hot or cold packs and use painkillers or relaxants for pain relief.

**Asthma**

Asthma is a chronic inflammatory lung disease that causes the airways to tighten and become narrow, causing difficulty in breathing.

*Symptoms*

The symptoms may include wheezing, cough and cold, tightness in the chest, sticky mucus, disturbed sleep and breathlessness.

*Causes*

It is believed that heredity factors are the main cause of asthma. Environmental factors, like dust, mite, pollen and occupational exposure to irritants also aggravate asthma. Cold, viruses, smoking, scent, pollution, change in weather conditions, etc., are also the triggering factors.

*First Aid*

In case of asthmatic attack, use asthma inhalers. Asthma inhalers are hand-held portable devices that supply medication to the lungs. These help in controlling asthma symptoms in adults and children.

**Food-borne illness**

Food-borne illnesses occur by consuming unhygienic foods and water. Bacteria are the common cause of food contamination.



## NOTES

### Symptoms

The common symptoms include diarrhoea, which may be bloody, nausea, abdominal cramps, vomiting, fever, dehydration, shallow breath, rapid pulse, pale skin and chest pain.

### First Aid

Oral Rehydration Salt (ORS) should be given with lukewarm water. In severe cases, the patient needs immediate hospitalisation.

Method for making 1 litre ORS solution using sugar, salt and water:

- Drinking water: 1 litre (5 cups, each containing about 200 ml)
- Sugar: Six teaspoons
- Salt: Half a teaspoon
- Stir the mixture till the sugar dissolves

## Practical Exercise

Practice Cardio Pulmonary Resuscitation (CPR) procedure on simulation.

## Check Your Progress

### A. Fill in the Blanks

1. A person suffering from fever ( $98.8^{\circ}\text{F}$  –  $100.8^{\circ}\text{F}$ ) is said to be suffering from \_\_\_\_\_ fever.
2. A person having a temperature of  $104^{\circ}\text{F}$  and above is said to be suffering from \_\_\_\_\_ fever.
3. In high fever, a person should be kept \_\_\_\_\_ by sponging with a wet towel or applying ice packs in the armpits.
4. \_\_\_\_\_ is a chronic lung disease that tightens and narrows the airways.
5. Back \_\_\_\_\_ is caused due to problems in ligaments and muscles of spine.
6. Bronchodilators are used in case of \_\_\_\_\_ attack.
7. \_\_\_\_\_ are the microorganisms, which are said to be the most common cause of food contamination.



8. \_\_\_\_\_ is a person who takes charge of an emergency scene and administers the First Aid.
9. \_\_\_\_\_ is a symptom and not a disease.
10. \_\_\_\_\_ must be given with lukewarm water.

**B. Short Answer Questions**

1. Who is a First Aider? Describe the role of a First Aider.
2. Describe the steps to take body temperature.
3. What is ORS? Describe the method for making 1 litre ORS solution.

**NOTES**

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