RESPONDING TO EMERGENCIES

UNIT 1
Recognizing Emergencies

UNIT 2
Transportation

UNIT 3
Cardio Pulmonary Resuscitation (CPR) and Automated External Defibrillator (AED)
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May, 2018

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Printed and published on behalf of the Indira Gandhi National Open University, New Delhi by Director, School Of Health Sciences.

Laser Typeset by: Tessa Media & Computers, C-206, Shaheen Bagh, Jamia Nagar, New Delhi-110025

Printed at: Raj Printers, A-9, Sector B-2, Tronica City, Loni (Gzb.)
Emergencies occur now and then. We may encounter emergencies any time and anywhere for which one must be ready to provide first aid immediately. When giving first aid, you as a first aid provider must understand, observe and recognize whether the situation which has just arisen, is an emergency or not. Recognizing emergencies is first and foremost task when dealing with emergencies. It is important to understand the signals and indicators that you see, hear, smell and feel which may point towards development of emergencies. Also, once an emergency has occurred, you should be able to assess the situation and arrange early transportation for the victim. You must also be capable to resuscitate the victim if he/she has collapsed. As a first aid provider, you must be careful in your observations, expert in recognizing the emergency, prompt in your response and pro-active in resuscitating the victim if need arises. Hence, in this block we will be discussing about various aspects to be taken care by you when you respond to or deal with emergencies in general. We will also study how to transport the victim and undertake emergency resuscitation.

This block consists of 3 units as follows:
Unit- 1 focuses on recognizing emergencies;
Unit-2 discusses transportation in detail; and
Unit-3 deals with Cardio pulmonary resuscitation and AED.

Thus, this block will provide you a detailed account about how to step wise deal with emergencies and how to resuscitate a victim in case such a situation arises. So, let us begin reading this important block and its units to develop knowledge about how to act and react in an emergency situation.
UNIT 1 RECOGNIZING EMERGENCIES

Structure
1.0 Introduction
1.1 Objectives
1.2 Emergency Situation
   1.2.1 Definition, Meaning and Causes
   1.2.2 Recognizing Emergency
1.3 Actions during Emergency
   1.3.1 Scene Safety
   1.3.2 Primary Assessment
   1.3.3 Secondary Assessment
1.4 Let Us Sum Up
1.5 Key Words
1.6 Answers to Check Your Progress
1.7 References and Further Readings

1.0 INTRODUCTION

In the previous Block i.e. Block 1 of this course, we highlighted the role of first aid provider in emergency situations. We also discussed the human body and its structure and the safety practices to be followed while giving first aid which help the first aid provider in ensuring his and victim’s safety from injury and infections during emergencies. These were the introductory units.

Now, coming to this first Unit of the second block of this course, we shall be discussing how to put to use your knowledge of human body, your role as a first aid provider and information on safety practices while dealing with an emergency situation and giving first aid. We all know that an emergency can happen at any time and at any place. An emergency is a situation which requires immediate action. The important task in emergency is to take appropriate action to save life. As a first aid provider, it is you whose responses will help save a life. Your first duty when giving first aid will be to see and remove anything that is threatening the life of the victim, then attend to the victim and transport him to a place where the medical care will be provided.

Thus, you need to know when to suspect an emergency, how to recognize emergency and what are the next steps that need to be taken in emergency. Hence, in this unit we shall be discussing the steps to be taken during emergency and giving first aid. Let us begin studying the unit.

1.1 OBJECTIVES

After completion of this unit, you shall be able to:

- define Emergency situations;
- explain the causes, indicators and recognition of Emergency situations;
- list the actions to be undertaken during Emergency situations and
Responding to Emergencies

- describe actions to be performed while giving first aid in Emergency situations.

1.2 EMERGENCY SITUATION

Emergencies are the situations which require immediate response. A first aid provider should have the knowledge on what is an emergency, what can cause emergency and how the emergency can be recognized. In this section, we shall discuss the emergency situation and understand when and where to suspect emergency. So, let’s begin.

1.2.1 Definition, Meaning and Causes

In this section we shall be discussing the concept and causes of emergency situation.

Definition

An emergency is a situation which requires immediate action. The emergency can occur due to medical illnesses like heart attack or injuries to the body, like broken arm or leg or sometimes injuries which affect a large part of the body or cause scare like burns and fires. All these situations are serious and are considered emergencies.

Meaning

The emergencies are dangerous situations which create a risk to life and health. There can be minor emergencies effecting less number of victims and having a low risk on life e.g. a small wound or scratch on the hand. The emergencies can be major effecting more number of victims and having a high risk on life.

The victim of an emergency can be anyone - he/she can be your friend, family member, stranger, or you yourself. An emergency can happen anywhere – on the road, at home, work or play and so on and can occur any time. Thus, in simple words it is the situation of sudden and unexpected occurrence which requires urgent attention.

Causes

Emergency can be caused by many reasons. The various causes of emergency are as follows:

- Road Traffic Accidents (Fig. 1.1 a)
- Fall from height
- Drowning in the deep water (Fig. 1.1 b)
- Poisoning due to any cause
- Injuries, Fractures, Sprain and Strains
- Burns and Fire (Fig. 1.1 c)
- Electrical Shock/contact with electric current
- Choking/Foreign Bodies in various organs
- Medical disease like diabetes, heart attack, asthma (Fig. 1.1 d)
- Insect Bites/Snake/Dog Bite
- Allergic Reactions and
- Heat and Cold related problems like sunstroke, high or low temperature, frost bite etc.
In everyday life, you may come across various situations that may cause emergency or lead to emergency. The knowledge on various causes of emergencies is essential to be aware about them and also avoid the situations that can complicate to emergencies and lead to problems/further complications. Now, we shall see as to how we can recognize emergencies.

### 1.2.2 Recognizing Emergency

We can come to know that an emergency is occurring because of certain things we see, hear, smell, touch and so on. Usually smell or noise can indicate emergency even before you see them. There may be unusual noise, smells, symptoms and signs or behaviour that point towards emergency. The following Table 1.1 describes some emergency indicators and their signals.

**Table 1.1: Emergency Indicators with their Signals**

<table>
<thead>
<tr>
<th>Emergency Indicators</th>
<th>Signals/Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unusual Noises</strong></td>
<td>The Noises that indicate</td>
</tr>
<tr>
<td></td>
<td>• someone is in problem or crisis, such as screaming, shouting, moaning, crying, and calling for help.</td>
</tr>
<tr>
<td></td>
<td>• alarming or high intensity sounds or noise, such as breaking glass, crashing metal or screeching tires.</td>
</tr>
<tr>
<td></td>
<td>• loud noises such as collapsing structures or falling ladders.</td>
</tr>
<tr>
<td><strong>Unusual Sights</strong></td>
<td>The Things that look out of ordinary</td>
</tr>
<tr>
<td></td>
<td>• stopped or parked vehicle which shows that some accident has occurred.</td>
</tr>
<tr>
<td></td>
<td>• an overturned or tilted or fallen pot e.g. if filled with hot water, it can cause burns.</td>
</tr>
<tr>
<td></td>
<td>• spilled medicines, empty medicine container, household disinfectants, insecticides may suggest the chance of poisoning.</td>
</tr>
<tr>
<td></td>
<td>• burnt electrical wires or if the wires indicate short circuit which may show the chance of electrical shock.</td>
</tr>
<tr>
<td><strong>Unusual Odors/Smells</strong></td>
<td>The Odors/Smells which may be</td>
</tr>
<tr>
<td></td>
<td>• stronger than usual e.g. as in case of toxic fumes or fumes during fires, LPG fumes that may start fires.</td>
</tr>
</tbody>
</table>
Responding to Emergencies

<table>
<thead>
<tr>
<th>Unusual Appearance or Behaviour</th>
<th>Unrecognizable odors or nauseous smells e.g. toxic fumes of sewage tanks or septic tanks which can cause poisoning and death.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural gas odors.</td>
</tr>
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</table>

The Appearance or Behaviour which may indicate:

- Unconscious e.g. not responding to your shouts or pain.
- Difficulty in breathing as in asthma/choking.
- Clutching the chest or throat as in heart attack or chest pain.
- Slurred or hesitant speech e.g. in stroke.
- Extreme confusion or drowsiness, sweating e.g. in blood sugar changes.
- Changes in skin colour as in insect bites/snake bites/medical conditions.

Thus, with the knowledge of above mentioned emergency indicators one is able to identify emergency situation and act promptly. Thus, once these emergency symptoms are recognized, the further action steps can be taken as discussed in forthcoming section.

### 1.3 ACTIONS DURING EMERGENCY

The recognition of emergency is important to decide your actions as a first aid provider. When you see, smell, hear and come face to face with situations in day to day life, you can recognize if an emergency is occurring or not. Once you come to know or recognize that the emergency has occurred, you decide to act and your actions will depend upon your knowledge about your roles and responsibilities as a first aid provider, issues that may arise in the situation, the knowledge of human body keeping in mind the safety precautions. Thus, you will perform the emergency action steps. These Emergency action steps will provide a protocol for giving first aid. The Emergency action steps are as follows:

1) Scene Safety
2) Calling for Assistance
3) Primary Assessment of the victim
4) Secondary Assessment of the victim

Fig. 1.2 shows the actions steps to be undertaken in emergency while giving first aid. In the forthcoming subsections, we will be discussing the emergency actions steps as listed above.

![Fig. 1.2 : Actions taken in Emergency (while giving first aid)](image)
Check Your Progress 1

1) Define Emergency.

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..............................................................................................................
..............................................................................................................

2) List the Emergency Action Steps.

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..............................................................................................................
..............................................................................................................

Note:
You can note the 4c’s acronyms which represents actions in emergency.

- Check the Scene.
- Call for help and the ambulance.
- Check the victim.
- Care for victim. Give first Aid

Let us now discuss the emergency action steps one by one in the upcoming subsections.

1.3.1 Scene Safety

The first and foremost step is scene safety. As you have already learnt that as a first aid provider, you need to ensure your own and your victims safety before you start giving first aid. Take for example, if you wish to help a road accident victim you can’t start the first aid before taking him to the side of the road, away from traffic because the rushing traffic can cause further injuries and in the middle of the road your and the victim’s life are both in danger. Take another example, if there is a sewage tank which is giving out toxic fumes, the workers need to be aware of the situation and should check the air quality before entering the tank to avoid death due to inhaling of toxic gases.

Scene Safety is defined as the safety of the area or place and the surroundings where the emergency has occurred. The first aid provider needs to check the scene to maintain the safety of scene, victim and his own. Not only one has to check his and victims safety but also the safety of the onlookers and the bystanders. (Fig. 1.3)
Responding to Emergencies

Scene Safety also stands for removing any dangers or hazards that may cause complications at the scene of emergency. The first aid provider needs to scan the area before doing so and must be alert in recognizing and immediately dealing with potential problems that make the scene unsafe.

Scene Safety is required for the following reasons:

- Avoid getting in trouble while helping the victim.
- Avoid complications to the victim and the bystanders/onlookers in terms of health or life.
- Save lives of the victims and whoso-ever is present on the scene.
- Preventing cross-infection by use of universal precautions, personal protective equipment and dealing with blood spills if any.
- Promoting safe environment to minimize deterioration of the victim’s condition.
- Deciding the extent of danger and determining your further action in emergency.

The various considerations for scene safety are as follows:

A) Assessing the Scene

The scene of the accident should be assessed for knowing the extent of danger, you and the victim are exposed to. Assessing the scene safety is of prime importance since this will help you to determine if and how to act in the situation.

The main things that one needs to assess at the site of emergency include the following:

- What is the situation?

  A first aid provider needs to know what the situation is. It is important to find out what has happened and if the situation is really an emergency or not. One should be alert for the emergency signals and indicators. One must check the scene and assess what might be the cause or mechanism of injury/emergency. E.g. what might have caused the fall from height, what may be the force with which the victim has fallen from height and what can be the complications.

- What kind of emergency has occurred?

  One needs to know the kind of emergency. It is essential to know if the emergency is medically related or related to trauma or is it related to the environmental reasons. E.g. Heart attack, Heat Stroke or Road accident, all are emergency situations but are different from one another and require different care.

- Where has the emergency occurred?

  The environment where the emergency has occurred is to be assessed. E.g. If the victim had received an electrical shock and has fallen into water, first aid provider must be alert to avoid the contact with this victim till the electrical supply has been shut off, or if the person is drowning in deep water and the first aid provider does not know how to swim, then the first aid provider must not put himself in danger to rescue the victim as the attempt would be unsuccessful. But he can alert the emergency medical services for helping...
the victim and closely observe or ask any bystander who knows how to swim and guide the bystander how to help the victim in this situation. So, the environment where the emergency had occurred is an important factor.

- **Is the situation safe?**

  It is important to check if the situation is safe or not. This requires you to be alert in a particular situation and also assess for any further signs that show if the situation is worsening. You must be careful especially in situations like accidents, electrical shock, burns, fires, toxic fumes which can immediately create life-threatening complications.

- **How many victims are involved?**

  It is also one of the important aspect in maintaining scene safety. More than one victim will require you to see as to who requires priority care and attend to them at first and then to others. This concept is triage and has been discussed later in this unit. Moreover, you need to check for young children or old victims. Also, you must be alert for unnoticed victims which may be hidden e.g. under/behind the car in accidents, under beds as in case of fires and so on.

- **What is the extent of injury?**

  If it is single or many injuries, head or spinal injury, the person is wearing helmet, the fracture is associated with blood loss or not, blood has been spilled, extremities cut off if any, person is unconscious, not breathing, not responding to your calls or shouts. All this information is collected as you assess abnormalities and it guides in immediately starting first aid and also it helps in determining complications.

- **Are there any potential hazardous things present at the site of the emergency?**

  This is assessed to avoid harm to the victim as well as the first aid provider who wishes to help the victim. Many serious hazards like contaminated blood, electrical wire, broken glass, spilled petrol/diesel/or presence of cylinder, toxic gases liberated in the air, insects/snakes, allergens are all potential causes of emergency and if present at the scene can render it extremely unsafe and you may not be able to perform first aid. So, either you need to clear these hazardous items or you need to call for assistance to save the victim.

- **Are there any bystanders to help?**

  The presence of bystanders is important. They can help you in making the scene safe, tell you about the emergency – how it occurred, what happened, they can call the ambulance, help you in identifying victims, help you in giving care or help you to transport the victim.

**B) Maintaining Scene Safety**

After assessing the scene and identifying problems, your next action is to maintain the scene safety. When you assess the scene, you will come to know the cause, type and reasons for the emergency. You will also be able to determine the why, where, how and when of the emergency. This will guide your action in maintaining the scene safety. Hence, here we will discuss what you need to do and what you should avoid doing.
Actions in maintaining scene safety

1) Check the scene and victims
   • Be calm and alert.
   • Check the area and the environment.
   • Look for clues about the causes of the emergency.
   • Carefully inspect the whole area.
   • Identify the number of victims and the extent of injury.
   • If the scene is safe, treat all large wounds before moving a casualty.

2) Clear the scene and victim
   • Move the victim away from danger to a safe environment. (Refer Unit 2 of this Block for guidelines on moving the victim)
   • If you can’t move the victim, remove the potential dangers around the victim.
   • If you can neither move the victim nor remove the dangers, maintain a safe distance or exit the area and call for assistance immediately as the situation may become life-threatening or dangerous.
   • As a rule, do not enter if you feel the scene is unsafe and if it becomes unsafe any time, leave the place immediately.

3) Protect all
   • Use personal protective clothing wherever needed.
   • Practice universal precautions. Maintain safe practices (Discussed in Unit 3 of previous block).

4) Take Help
   • Take help of bystanders to assist you in making the scene safe.
     – Call bystanders to help you in assessing the victim e.g. controlling severe bleeding or supporting badly injured limb.
     – Ask them to control traffic or crowd or send them to telephone medical services for assistance.
     – Make them understand the message correctly.
   • Call for ambulance or Emergency Medical services.

5) Care for Victims and Triage
   • If there are many victims, prioritize your first aid care as per the following order:
     Highest Priority (Requiring Immediate Attention).
     – Airway is obstructed.
     – Cardiac arrest.
     – Severe bleeding.
     – Severe head injuries.
     – Open chest or abdominal wounds.
     – Severe shock.
     – Burn involving respiratory tract.
Recognizing Emergencies

Second Priority (Requiring Delayed Attention)
- Severe burns.
- Injuries to spine.
- Moderate bleeding.
- Conscious victim with head injury.
- Multiple fractures.

Lowest Priority (Having Minor Injury and requiring lowest attention)
- Minor bleeding.
- Minor burn.
- Obvious mortal wounds where first response is not helpful.
- Obvious death.

This sorting of victims as per their condition and requirement of first aid is called Triage. In many mass casualty scenario, colour codes or tags are given to the victims as follows:
1) Highest priority - Red
2) Second Priority - Yellow
3) Lowest Priority - Green

Incase any one is dead, Black tag or identifier is given. It is important to do Triage incase of disaster or any emergency situation involving many people.

Avoid the following
- Avoid getting into confined areas with no ventilation, collapsed structures, deep waters or areas with toxic gases or electrical wires.
- Avoid getting into dangerous situations that are life-threatening, rather call for assistance.
- Avoid touching the cut off part of body or blood without barrier like gloves or clean cloth as this may lead to cross-infection.

Safety and Precautions

Safeguard yourself and access the scene
- The scene can be accessed in the following ways:
  a) Falling objects (collapsed building)
     Use a safeguard like helmet, if it is safe to do so.
  b) Leakage of any poisonous gas
     Use a gas mask if it is available otherwise do not enter.
  c) Someone standing with a weapon
     As a rule, ask the person to hand over the weapon first.
  d) Running traffic
     Ask someone to stop the traffic and move the victim to a safer place (e.g. beside the road).
  e) Live electricity wire
     Do not enter within eight feet of the live wire and switch off the electricity if it is safe to do so.
Responding to Emergencies

f) Spilled over chemical
Dilute the chemical with water and remove any clothes soaked in the chemical using a barrier (e.g. a stick or a pair of glove).

g) Slippery surface (e.g. on the bank of river/pond or sea beach)
Move the victim to a dry surface.

• Safety from the victim
  a) As a rule, blood and all body fluids/substances are infectious.
  b) To prevent the contact of disease always use protective barrier between yourself and ill/injured person.
  c) Disposable gloves and face mask are the commonly used barriers. Inspect gloves/mask for damage or tears before use. If damaged, replace immediately.
  d) Never snap the gloves, it can splatter the blood.
  e) Always remove contaminated gloves carefully.

You have already studied the safety precautions in Unit 3 of Block 1 of this course which should be strictly followed to avoid cross-infection which is very common while giving first aid or doing first aid procedure.

C) Calling for assistance

Calling for Assistance is important step after making scene safe. Assistance in many emergencies may be required like heart attack, major insect bites, excessive trauma, burns, bleeding and many other such conditions which are life threatening and you alone may not be enough to revive the person. However, in situations major or minor, one must call for assistance immediately so that safety of the victim is maintained. The assistance from bystanders can be sought and the ambulance services can be called to save crucial minutes of life when life-threatening emergencies have occurred.

You can ask the bystanders to call for ambulance or you can yourself alert the Emergency Services (System) or Helpline number 112. Many numbers have been provided in Unit 1 of Previous Block.

Remember the following:

• Call emergency medical services, ambulance, police, fire brigade as required.
• If the victim has a minor injury, call for the ambulance or emergency medical services if required as per assessment.
• If there is massive/major injury, use a mobile phone to call the emergency services or send a bystander to call the emergency medical services or ambulance. You should be with the victim.
• When you call the emergency services, pass the following information to the Emergency Medical Services:
  – Your telephone number.
  – Location of incident.
  – Type, nature and seriousness of the incident.
  – Number, sex, and approximate age of casualities involved.
Recognizing Emergencies

- Request special aid as per victims condition e.g. old person, child, pregnant lady, severe injuries with loss of blood and so on.

Thus, by undertaking the above stated actions, one is able to maintain scene safety. You can study Practical 1, Block 1 of Practical Course for developing skills in assessment of the scene. Now, the next step is to start assessment of the victim and provide support to the victim as per the primary assessment of the victim. Now, let us discuss this in detail in the next section.

### Note:

You can remember the following acronym for scene safety. You can use any one for reference.

1) **CLAP**
   - **C** – Control the situation and take charge of the situation
   - **L** – Look for potential hazards
   - **A** – Assess the situation, gather information
   - **P** – Protect yourself and the victim and prioritize your care.

2) **EMCAP**
   - **E** – Check Environment
   - **M** – Check Mechanism of injury
   - **C** – Check for Casualties
   - **A** – Provide Assistance
   - **P** – Always use Personal protective equipment.

### 1.3.2 Primary Assessment

After scene safety has been established and you have called for assistance, the next step is to conduct a primary assessment of the victim/victims. Primary Assessment involves initial observation and first aid measures to stabilize the victim. It involves checking the victim’s response, circulation, airway and breathing. These are vital signs that need to be checked in order to preserve life and promote recovery during emergency. Let us discuss these in detail.

**A) Assessment of the victim**

While doing initial assessment of victim, you have to be active and quick. You must handle the victim gently but firmly. You must take into account the immediate signs to be checked like response, circulation/pulse and airway/breathing.

It is important to remember that the person should be maintained in straight position with head facing you (Fig. 1.4). Log Roll the person (Fig. 1.5) if found in a different position but carefully if spinal injury is suspected since unnecessary movement may cause further injury.

![Fig. 1.4: Head of the Victim should face the First Aid Provider](image)
Now proceed by doing the following:

1) **Check Level of Consciousness/Responsiveness**

The first thing is to find if the victim is conscious or not. It is important to find out if the person is responding. So, let us learn how we have to do assessment of level of responsiveness.

Approach to be used in assessing responsiveness:
- Do not jerk or move the victim.
- Gently tap and ask questions.

Questions to be asked:
- “What Happened?”
- “Are you Okay?”
- “Open your eyes”
- “Where are you?”

Assessment is done as:
- A victim who can respond to you is conscious, breathing, and has a pulse.
- A victim who is unable to respond may be unconscious.

You may use **AVPU system** to determine the level of consciousness of the person as given below:

| A — Alert | Victim is aware of surroundings, time, date and his name. |
| V — Verbal | Victim is disoriented but responds when spoken to, may not have spontaneous eye opening but will open eyes to verbal stimulus. |
| P — Pain | Victim does not respond to questions, but moves or cries out in response to painful stimulus |
| U — Unresponsive | The Victim does not respond to any stimuli. |

**Note:**

When someone is unconscious, and lying on his/her back, tongue may fall back in the throat and block the airway creating further problem. For this open the airway of the victim after turning the victim in the position with his face on one side facing you called recovery position. However, avoid this if you feel that the person may have spinal/neck injury. In this case, you will log roll the person with help of bystanders. (You will learn about this technique in Unit 2 on Transportation in this block).
2) Check for Circulation/Pulse

The next step is to check for the circulation of blood.

When the heart stops beating, blood will no longer be pumped into the body. The person will have no pulse. Without adequate circulation, the victim will die in just a few minutes because the brain is not getting any oxygen. This is especially important for victims of accidents, trauma or injuries where loss of blood is massive.

To check the circulation in the body, you should feel the pulse at major pulse sites so as to assess the circulation in the body. These are radial and carotid pulse sites. (Refer Unit 2, Block 1 of Practical Course for developing skills in taking pulse)

You should also scan the body for signs of bleeding or any wounds which may be leaking blood from the body. If bleeding is severe, shock develops, and the casualty may lose consciousness. If the bleeding is not controlled, the heart could stop. Bleeding at the face or neck may decrease/stop the air flow to the lungs. When treating severe bleeding, check first whether there is an object embedded/penetrated in the wound; take care not to pressure the object.

It is not always easy to recognize severe bleeding but you need to make judgment and control it as soon as possible.

3) Check for Airway

The airway is the passage for air from the nose and mouth to the lungs. An open airway allows enough air to breath. If the airway is blocked by vomitus, blood, food, object, or the tongue, a person cannot breathe.

If any thing is stuck in the airway like vomitus or blood, it can be removed by tilting the head in recovery position i.e. position on the side but one has to be careful for victims having head/suspected neck or spinal injury. If you wish to remove any foreign body, one can sweep the mouth carefully not to allow the object to enter further deep.

4) Check for Breathing

To check for breathing, you need to see if the person is responding to your questions. If he is talking he is conscious and breathing. If unconscious then, you can check his breaths or the movement of the chest to check if the person is breathing.

5) Check for Injuries, wound, bleeding

When the pulse is present, person is responsive and is breathing, you will than survey for presence of injury/wound and bleeding.

In this , assess for DOTS :

DOTS stands for:

D- Deformities ( abnormal shape of body part which can be seen by comparing the two sides of the body)

O- Open wounds ( wounds open and bleeding in which upper layer of skin is torn)

T- Tenderness ( pain due to pressing an area)
S- Swelling (swollen area)

These are the major things that you must assess and then proceed to detailed head to toe examination.

The next step will be to treat the person. Let us see what you need to do.

B) Priorities of treatment

When you have assessed the victim, provide First Aid as per your assessment till the ambulance arrives. Refer Fig. 1.6 for steps of Primary Assessment. You should proceed as per following:

1) Check levels of responsiveness, if conscious talk and gather information about the victim, his condition, what happened and so on.

2) If unconscious, quickly check the pulse, heart beat and airway/breathing.
   – If the pulse is present and breathing, place the victim in recovery position (Refer Unit 7, Block 1 of Practical Course 1 of this programme) and monitor victim till the medical help arrives.
   – If there is pulse but no or abnormal breathing, start Rescue Breathing (Refer Unit 3 of this Block for Rescue Breathing).
– If there is no pulse and no or abnormal breathing, start Cardio Pulmonary Resuscitation (CPR). If the person does not show improvement use Automated External Defibrillator (AED) [Refer Unit 3 of this Block for CPR and AED].

3) Check the victim for any bleeding and control it. Take the help of bystanders.

4) If there is any possibility of spinal injury, do not move the victim call for help or ambulance and give CPR or rescue breaths keeping victim in straight position only.

5) If the casualty is in danger, temporarily immobilize the injured part before moving immediately.

6) In case of many victims, sort the victims (triage) and prioritize the care as:
   a) First provide first aid to those who have life threatening injuries. If more than one victim is having life threatening injuries, treat only the life threatening injuries on each victim and then move to the next victim. Later see the minor injuries on these victims.
   b) Secondly, provide first aid to those who have major injuries i.e. closed fractures, major lacerations or major wounds. If left untreated these can develop into life threatening injuries.
   c) Treat third, who have minor injuries which don’t require special care.
   d) Lastly, treat those who are dying and cannot be saved or those who are obviously dead.

Note:
The primary assessment has to be done for all the victims for whom you are providing first aid.

Remember:
The sequence in primary assessment and care include:
R for Response, then CAB i.e.
C for Circulation i.e. Pulse/Heartbeat
A for Airway
B for Breathing i.e. Respiratory Rate.
When resuscitating the victim, CPR is performed by giving
C for circulation, resuscitated by doing Chest Compressions
A and B for Airway & Breathing, resuscitated by doing Rescue Breathing. This is discussed in Unit 3 of this block.

C) Transportation of the victim
The next approach while assessing and providing initial emergency first aid to the victim is to attempt to transport the victim to the health facility or specialty centers like burns centre, trauma centers. The transport can be either provided by you or in the ambulance when the medical help arrives. The various ways to transport the victim have been discussed in Unit 2 of this Block for your detailed reference.

Thus, the primary assessment is initial survey of the victim and care undertaken as soon as you find a victim, scene has been cleared and medical help is called
for. It is carried on till the person revives or medical help arrives or you or ambulance transports the victim to the health care facility and you hand over the victim to medical care for better further medical support or hospital.

After the primary assessment, the secondary assessment is done to gather further information about the status of the victim. This is discussed in the next subsection.

**Note:**
After transportation or on arrival of medical help, you should hand over the victim to the medical personnel. While doing so, you should provide information to the medical personnel regarding the incident and the victim. The following acronyms represent the information you should provide while handing over the victim to medical help. You can use any one for reference:

<table>
<thead>
<tr>
<th>1. METHANE</th>
<th>2. CHALETS</th>
<th>3. MIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>M - Major incident</td>
<td>C- Casualities, number, type, severity</td>
<td>M- Mechanism</td>
</tr>
<tr>
<td>E - Exact location</td>
<td>H- Hazards (present and future)</td>
<td>I - Injury/Illness</td>
</tr>
<tr>
<td>T - Type of incident</td>
<td>A- Access routes that are safe to use</td>
<td>S - Signs and Symptoms</td>
</tr>
<tr>
<td>H - Hazards (present and future)</td>
<td>L- Location</td>
<td>T - Treatment given</td>
</tr>
<tr>
<td>A - Access to the area</td>
<td>E- Emergency services present and required</td>
<td></td>
</tr>
<tr>
<td>N - Number, type, severity of casualties</td>
<td>T- Type of incident</td>
<td></td>
</tr>
<tr>
<td>E - Emergency services now present and those required</td>
<td>S- Safety</td>
<td></td>
</tr>
</tbody>
</table>

### 1.3.3 Secondary Assessment

After you have assessed and resuscitated the victim after primary assessment, the next step is to conduct secondary assessment which is done either at the site of emergency or during transportation if you are accompanying the victim. The keys steps in secondary assessment are as given below:

#### A) Assessing Vital Signs

These are essential signs that help in recognizing the overall well being of the victim. These give the information about the major body systems and help in deciding if these are functioning normal or abnormally.

- Body temperature
- Pulse rate
- Respiration rate (rate of breathing)

Let us discuss these one by one:

#### 1) Body temperature

**Definition**

The body temperature may be defined as the degree of heat maintained by the body or balance between the heat produced and heat lost in the body.
**Purpose of taking temperature**
- Tells about health status of the person.
- Helps to find out alteration in health status e.g. fever, low body temperature etc.

**Normal temperature**
The temperature of the average healthy human being is 98.6°F (37°C).

**Common Site** for taking Temperature is Axillary (under the axilla).

**Method** of taking Body Temperature is by use of Thermometer.

2) **Pulse Rate**

**Definition**
Pulse is an alternate rise or fall of an artery as the wave of the blood is forced through it during the contraction of the left ventricle of the heart.

**Purposes**
- Gives information on the circulation of blood in the body.
- Tells about working of the heart.

**Normal pulse rate**
The normal pulse rate of an adult is about 72 beats per minute. Infants have higher average pulse rate. According to the age, the normal pulse rate is given below:

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal Pulse Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old age</td>
<td>60 to 70 beats per minute.</td>
</tr>
<tr>
<td>Adults</td>
<td>60 to 80 beats per minute.</td>
</tr>
<tr>
<td>Children</td>
<td>70 to 120 beats per minute.</td>
</tr>
<tr>
<td>Toddlers</td>
<td>90 to 150 beats per minute.</td>
</tr>
<tr>
<td>New born</td>
<td>120 to 160 beats per minute.</td>
</tr>
</tbody>
</table>

**Site for taking pulse**: Many sites are present but radial and carotid pulse sites are main sites for taking pulse.

**Method** of taking pulse is by feeling against the tips of your fingers at the sites /points where the artery crosses a bone close to the surface of skin.

3) **Respiration rate (rate of breathing)**

**Definition**
The respiration is the act of breathing. It involves two processes i.e. inspiration (breath in) and expiration (breath out) followed by pause.

**Purposes**
- Gives information on the airway and breathing.
- Tells about functioning of the lungs to effectively exchange gases.

**Normal Respiratory Rate**
Normal adult respiration is 16-20 breaths per minute. According to the age, the normal respiratory rate is given below:

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal Respiration Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>30-40/min</td>
</tr>
<tr>
<td>Adolescent</td>
<td>18-20/min</td>
</tr>
</tbody>
</table>
Responding to Emergencies

c) Adult : 16-20/min
d) Old age : 10-20/min

Method to take respiratory rate is to check the rise and fall of chest in a minute.

The above discussion gives an account about the vital signs. Refer Practical 2, Block 1 of Practical Course 1 for the detailed procedure on how to check temperature, pulse and respiration.

B) Taking History and Assessing Symptoms

The history helps to find out how an incident happened, how any injury occurred or how any illness began and continued. To take the history, question the victim and talk to bystanders who witnessed the incident. You can ask the following:

- If the casualty has any illness?
- Is he/she taking any drug/medication?
- How injury/accident has occurred and how forcefully it has exerted?
- What is the age and state of health of the victim?
- Does the victim have any allergies?
- Is the person on any medication?

Note:

You can remember the following acronym for taking history

S - Sign and symptoms
A - Allergies
M - Medications
P - Past History
L - Last eaten food or taken drink
E - Events causing present illness/emergency

If the casualty is unable to co-operate or is unconscious look for external clues e.g. medication, food, drugs, needle, syringes, which gives valuable clues about an incident. Appointment card in victim’s purse/pocket indicating history of allergy, diabetes, or epilepsy also give clues.

This information is crucial and should be told to the medical personnel along with time of injury, symptoms assessed and your examination findings which you will study in the subsection to come. You must communicate properly and confidently to illicit necessary data from the victim and must pass this on carefully to the medical personnel.

Another important aspect in secondary assessment is the assessment of sign and symptoms. There are various ways by which you can assess signs and symptoms as given in Table 1.2).

Table 1.2: Method of identifying the Symptoms and Signs of Illness or Injury

<table>
<thead>
<tr>
<th>Method of Identification</th>
<th>Symptoms or Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim may tell you these symptoms</td>
<td>Pain, Anxiety, Heat, Cold, Loss of Sensation, Thirst,</td>
</tr>
<tr>
<td></td>
<td>Nausea, Pain on Touch or Pressure, Faintness,</td>
</tr>
<tr>
<td></td>
<td>Stiffness, Momentary Unconsciousness, Weakness,</td>
</tr>
<tr>
<td></td>
<td>Memory Loss, Dizziness, Sensation of Broken Bone,</td>
</tr>
<tr>
<td></td>
<td>Sense of Impending Doom</td>
</tr>
</tbody>
</table>

Recognizing Emergencies

You may see these signs
Anxiety and painful expression, Unusual chest movement, Burn, Sweating, Wounds, Bleeding, Response to touch, Response to speech, Bruising, Abnormal skin color, Muscle spasm, Swelling, Foreign bodies, Vomit, Loss of normal movement

You may feel these signs
Dampness, Abnormal body temperature, Swelling, Deformity, Irregularity in bone/limb shape

You may hear these signs
Noisy or distressed breathing, Groaning, Sucking sounds (chest injuries), Grating bone as in fractures

You may smell these signs
Acetone, Alcohol, Burning Gas or fumes, Solvent or glue, Urine, Feces

C) Detailed Head to Toe Examination

Once you have taken the history and asked about symptoms that the victim has, you should carry out a detailed examination of the person. This is done from Head to Toe. As you do the head to toe examination, think about how the body normally looks. Be alert for any signs or sounds that are unusual. If you are certain that findings are unusual, compare with other side of the body. Ask the victim to tell you if any area is hurt and avoid touching any painful area or having the victim move any area that is painful. The Sequence of Head to Toe examination is as follows which is also highlighted in Fig. 1.7

1) **Head**

   Begin your check at the victim’s head. See the scalp. Look for cuts, burns, bruises and depressions. Run your hands carefully over the scalp to feel for bleeding, swelling, or depression which may indicate possible fracture. Do not move the casualty if you suspect he/she may have injured back or neck or spine.

2) **Ears**

   Speak clearly in both ears to find out if he/she responds and can hear. Look for blood or clear fluid coming from either ear as this is the sign of damage inside the skull.

3) **Eyes**

   Examine both eyes. Note whether the eyes are open. Check the size of pupils, change in size occurs when they react to light. Look for any foreign body, blood or bruises.

4) **Nose**

   Check the nose for any discharge, blood or clear fluid (or mixture of both). It might indicate injury inside skull.

5) **Mouth**

   Note the breathing of casualty (easy, difficult, noisy, or quiet, the smell, rate, depth, and nature of respiration). Look for wounds in the mouth. Check the lips for burns.

6) **Skin**

   Notice how the skin look and feels. The appearance of skin and its temperature often indicates something about victim’s condition e.g. a victim
Responding to Emergencies

with a flushed (red), pale face may be ill. Note if the skin is reddish, bluish, pale, hot, cold, dry or damp. For example pale, cold sweaty skin suggests shock, a flushed hot face suggests fever or heatstroke. A blue tinge indicates lack of oxygen. Look for these signs especially in the lips, ears and face.

7) Neck
To check the neck, ask if the injured person has neck pain. If he/she is not able to move his/her head from side to side or you suspect neck/spinal injury, run your finger gently along the spine from the base of skull downwards as far as possible, without disturbing the casualty’s position. Check for any irregularities, swelling or tenderness.

8) Shoulder
Check the shoulder by asking the person to shrug them. Gently feel for any deformity, irregularities.

9) Trunk
Check the chest and abdomen by asking the person to try to take deep breaths and then blow the air out. Feel the ribcage to check for deformity, irregularities, tenderness, listen for unusual sounds. Observe for pain and look for bleeding.

Gently feel the victim’s abdomen to detect any evidence of bleeding and to identify any rigidity or tenderness of abdomen. Check the back for any spinal injury.

10) Extremities
Check the movement of elbow, wrist and fingers by asking the person to bend and straighten the arm and hands. Check if casualty feels any abnormal sensation in the limbs. Look for the bleeding, swelling, deformity or tenderness. Determine if the victim can move the limbs. If there is any impairment in movement or loss of sensation in the limbs, do not move the victim because these signs suggest spinal injury.

Fig. 1.7: Detailed Head to Toe Examination
The findings of detailed examination should be noted and shared with the medical personnel. It is your important responsibility.

**Check Your Progress 2**

1) Why taking history is important?

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..............................................................................................................
..............................................................................................................

2) How will you check the level of consciousness of victim?

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..............................................................................................................
..............................................................................................................
..............................................................................................................

3) How will you assess circulation?

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..............................................................................................................
..............................................................................................................
..............................................................................................................

So, by above discussion we learnt that systematic approach in any Emergency is as follows:

**D** Danger

**R** Response

**S** Scene Safety and Send for Help

**C** Compression (circulation)

**A** Airway

**B** Breathing

**T** Transport

- **Danger:** Look out for any danger to the casualty and to yourself. There may be falling debris, moving machines, traffic or gas which may pose danger. If danger is there then either remove the danger or the casualty from the scenario before moving further in the procedure.

- **Response:** Check the response of the casualty whether alert, semi conscious or unconscious by voice, gentle shaking or mild pain like pinching.

- **Scene safety and Sending for Help:** Call for help e.g. ambulance or ask someone to call for help. Always take help from other people.
Responding to Emergencies

- **Compression**: If unresponsive casualty with no vitals e.g. heart beat and respiration then give 30 chest compressions in the middle of chest (Discussed in Unit 3 of this Block).

- **Airway**: Clear the airway by (Discussed in Unit 3 of this Block) head tilt and chin up or jaw thrust and remove any obstacle if present in nose or mouth.

- **Breathing**: Give 2 ventilations i.e. mouth to mouth respirations (Discussed in Unit 3 of this Block).

- **Transport**: Try to transport i.e. bring the casualty under medical help as soon as possible.

In case the casualty is responding and there is no need to use CAB then try to find out the injury or disease with the help of Secondary Assessment as:

**Signs**: The changes we can see in the body e.g. sweating, skin colour, temperature, pulse etc.

**Symptoms**: The complaints of the casualty e.g. dizziness, vomiting, pain, thirst etc

**History/ Scene**: The scenario of the incidence or the explanations of the casualty or the bystanders e.g. history of epilepsy, road accident etc.

1.4 **LET US SUM UP**

In this unit, we learnt that the first duty as a first aid provider in emergency is to recognize the emergency and assess the victim for life threatening conditions that need emergency first aid. Once the casualty is out of immediate danger, assess the situation. Put your safety first and deal with any danger. Immediately call for assistance as you will require it. When it is safe, then approach the victim and perform primary assessment and manage the victim as per the situation present. Once the victim is stabilized, find out what happened (takes history) and perform examination. Refer Unit 1 of Block 1 of Practical Course for practical aspects of this Unit.

Hope, you will appreciate what your role is when you have to recognize and deal with emergencies as highlighted in this unit. In the next unit, we will deal with transportation in various circumstances which is also one of the important aspect in preserving well-being and reducing crucial minutes which count when saving lives.

1.5 **KEY WORDS**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatening</td>
<td>Fearsome/Terrifying situation</td>
</tr>
<tr>
<td>Transport</td>
<td>Take or carry from one place to another</td>
</tr>
<tr>
<td>Actions</td>
<td>Doing something</td>
</tr>
<tr>
<td>Response</td>
<td>Reaction to something</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Information or awareness of a situation</td>
</tr>
<tr>
<td>Minor</td>
<td>Lesser in importance</td>
</tr>
<tr>
<td>Major</td>
<td>Larger in importance</td>
</tr>
</tbody>
</table>
Recognizing Emergencies

Sudden: Occurring quickly without knowledge or expectation/Un-expected

Occurrence: Event that happens

Urgent: An event that requires action or attention

Attention: Action of taking care of something

Crisis: Time of intense danger

Alarming: Worrying or disturbing

Intensity: Power/Force

Crashing: Break or smash into pieces

Screeching: Harsh/loud cry

Overturned: Tip over side or upside down

Spilled: Cause to flow down

Disinfectants/Insecticides: Agents that kill insects or make the area free of germs

Unrecognizable: The one which cannot be identified/recognized

Nauseous: Causing vomiting

Natural: Existing in or derived from nature

Odor: Smell

Momentary: Lasting for a small time

Protocol: Some procedure or way of doing things

Clutching: Grasp tightly

Disaster: A sudden occurrence/accident

Shrug: Raise slightly

Vomitus: Matter vomitted out

Bystanders: Person who is present at an event or incident but does not take part/Onlooker

Slurred: Saying something quietly which others can’t hear

Hesitant: Unsure or Slow in action

Extreme: On great level

Confusion: Uncertainty about what is happening

Drowsiness: Being lethargic/sleepy

Promptly: Without waiting or delay/immediately

Extent: Particular degree to which something is

Prime: Of first importance; main

Worsening: Becoming worse

Attempt: Make an effort to achieve or complete

Particular: Specific

Priority: Fact or condition of being regarded or treated as more important than others

Abnormalities: Abnormal feature/Deformity

Potential: Showing the capacity to develop into something in the future

Hazards: Danger/Risk

Assistance: Helping someone
Responding to Emergencies

<table>
<thead>
<tr>
<th>Clues</th>
<th>Indicator or signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect</td>
<td>Observe</td>
</tr>
<tr>
<td>Confined</td>
<td>Restricted to a particular area</td>
</tr>
<tr>
<td>Toxic</td>
<td>Poisonous</td>
</tr>
<tr>
<td>Access</td>
<td>Opportunity to approach or enter a place</td>
</tr>
<tr>
<td>Weapon</td>
<td>Thing used for inflicting physical damage</td>
</tr>
<tr>
<td>Assessment</td>
<td>Evaluation or Judgment of something</td>
</tr>
<tr>
<td>Stabilize</td>
<td>Make or become unlikely to change, fail, or decline</td>
</tr>
<tr>
<td>Jerk</td>
<td>Quick, sharp, sudden movement</td>
</tr>
<tr>
<td>Spontaneous</td>
<td>Performed or occurring as a result of a sudden impulse</td>
</tr>
<tr>
<td>Verbal</td>
<td>Spoken</td>
</tr>
<tr>
<td>Stimulus</td>
<td>Thing or event that leads to reaction</td>
</tr>
<tr>
<td>Temporarily</td>
<td>For a limited period of time/Not permanent</td>
</tr>
<tr>
<td>Immobilize</td>
<td>Restrict movements, prevent from movement</td>
</tr>
<tr>
<td>Revives</td>
<td>Restore or regain life</td>
</tr>
<tr>
<td>Primary</td>
<td>Early in time/First</td>
</tr>
<tr>
<td>Secondary</td>
<td>Later in time/after primary</td>
</tr>
<tr>
<td>Accompany</td>
<td>Go with someone</td>
</tr>
<tr>
<td>Snap</td>
<td>Break Suddenly</td>
</tr>
<tr>
<td>Splatter</td>
<td>Splash a liquid</td>
</tr>
<tr>
<td>Bruises</td>
<td>Injury/mark appearing as an area of discolored skin</td>
</tr>
<tr>
<td>Depression</td>
<td>Sunken area</td>
</tr>
<tr>
<td>Grating</td>
<td>Harsh sound</td>
</tr>
<tr>
<td>Alteration</td>
<td>Process of changing</td>
</tr>
<tr>
<td>Alternate</td>
<td>Occur in turn repeatedly</td>
</tr>
<tr>
<td>Special aid</td>
<td>Special support methods</td>
</tr>
</tbody>
</table>

1.6 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) An emergency is a situation which requires immediate action.
2) Emergency actions steps are as follows:
   a) Scene Safety
   b) Primary Assessment of the victim
   c) Calling for Assistance
   d) Secondary Assessment of the victim

Check Your Progress 2

1) The history helps to find out how an incident happened, how any injury occurred or how any illness began and continued.
2) Approach to be used in assessing responsiveness:
   - Do not jerk or move the victim.
   - Gently tap and ask questions.
Questions to be asked:

- “What Happened?”
- “Are you Okay?”
- “Open your eyes”
- “Where are you?”

You may use AVPU system to determine the level of consciousness of the person as given below:

| A — Alert | Victim is aware of surroundings, time, date, and name. |
| V — Verbal | Victim is disoriented but responds when spoken to, may not have spontaneous eye opening but will open eyes to verbal stimulus. |
| P — Pain | Victim does not respond to questions, but moves or cries out in response to painful stimulus |
| U — Unresponsive | The Victim does not respond to any stimuli. |

3) To check the circulation in the body, you should feel the pulse at major pulse sites so as to assess the circulation in the body. These are radial and carotid pulse sites.

1.7 REFERENCES AND FURTHER READINGS

UNIT 2  TRANSPORTATION

Structure

2.0  Introduction
2.1  Objectives
2.2  Moving, Lifting and Transportation of a Victim
  2.2.1  Concept and Importance
  2.2.2  Factors Affecting
2.3  Moving a Victim
  2.3.1  Methods of Moving a Victim
  2.3.2  Safety and Precautions
  2.3.3  Do’s and Don’ts
2.4  Lifting a Victim
  2.4.1  Methods of Lifting a Victim
  2.4.2  Safety and Precautions
  2.4.3  Do’s and Don’ts
2.5  Transportation of Victim
  2.5.1  Methods of Transportation of a Victim
  2.5.2  Safety and Precautions
2.6  Let Us Sum Up
2.7  Key Words
2.8  Answers to Check Your Progress
2.9  References and Further Readings

2.0  INTRODUCTION

In case of any illness and injury, there may be a need to carry the casualty to a safer place or to a medical facility. As you have learnt in the previous unit of this block, transportation is an important step after assessment of the victim. The transport/carrying the casualty is very important in first aid which a first aid provider must be able to perform swiftly with utmost care. Along with this it is essential to know how to move and lift the victim. The wrong choice of method or delay may be fatal for the casualty.

This is especially important in areas where the strict ambulance facilities are not available and the first aid provider has to himself/herself transport the victim from the site of emergency. Many a times, transport may be initiated to avoid losing time in emergency. In this unit, we shall be discussing the various methods to move, lift and transport the victim in emergency. This unit will help you to develop knowledge about improvising the available supplies for transporting the victim. So, let us begin studying this unit.
2.1 OBJECTIVES

After completion of this unit, you shall be able to:

- explain importance of transportation;
- list the factors influencing the method of carrying casuality;
- discuss methods of moving and lifting casuality; and
- describe methods of transporting casuality with safety precautions.

2.2 MOVING, LIFTING AND TRANSPORTATION OF A VICTIM

Moving, lifting and transportation of a Victim is an important step when providing care and first aid to the victim. Let us discuss these as follows:

2.2.1 Concept and Importance

In emergency situations, we may arrive at the scene of emergency and as a first aid provider our duty is to give first aid to the victim. The scene safety is the first step and has to be maintained to ensure your own and victim’s safety. You can call for assistance from bystanders and ambulance to transfer the victim to medical facility. However, when you approach the victim, you may need to move him as he/she may be lying in a different position. You have to do his primary assessment and based on this assessment you will provide first aid. Then, in order to save life in many conditions where ambulance is late or your residence is far away or in remote areas, you may have to yourself lift and transport the person and you must know how to do so.

Moving is defined as the action in emergency to position the victim in such a way that he/she faces you. Moving is important to shift the victim away from the scene of emergency or move him/her to position required for resuscitation purposes/providing CPR (Fig. 2.1). However, in case of suspected neck/spinal injury, moving is not allowed as movement can further damage the spinal cord of the victim.

![Fig. 2.1: Moving a Victim](image)

If Moved, position of victim changes

- From face down to face up position
- From resting on right side to left side position
- From lying to sitting position
- From one place to another
Moving helps in change of position and shifting the victim.

**Lifting** the victim is defined as the action in emergency in which victim is lifted either by the first aid provider or on any other supportive measure to be transported to the area where first aid is provided or to the ambulance. (Fig. 2.2)

![Fig. 2.2: Lifting a victim](image)

If Lifted, position of victim changes
- From lying to standing position
- From lying to putting on stretcher

**Transportation** of the victim is defined as the emergency action step carried out in vehicle/ambulance for taking the victim away to the health care facility/hospital for further treatment. (Fig. 2.3)

![Fig. 2.3: Transportation of the Victim in Ambulance](image)

When Transported, position of victim changes
- From place of incidence/emergency to medical facility.
- From place of incidence/emergency to safer place.

While giving first aid you have to decide whether medical help is needed or not. In any case, one has to remember that the victim should be moved very less, lifted and even transported for required medical help. An improper movement may worsen the case as there may be internal organ injury or spinal injury or fractures which can be further damaged with improper movement. The importance of moving and transporting the victim is:
- Proper treatment e.g. to reach to the back of head for applying dressing.
- Carrying the casualty to ambulance or medical facility.
- Taking away the casualty to safer place from hazardous surroundings.
• Rapid treatment and recovery.
• Move the victim away quickly for saving life.

### 2.2.2 Factors Affecting

There are many deciding factors affecting the method of transportation of a particular casualty. It is very important that these factors are considered before carrying the casualty since any mistake may worsen the situation. The factors are as follows:

- **Number of persons**: There are different methods to carry the victim in case of one, two or more persons or bystanders available.
- **Material/Resource**: If stretcher is available then nothing like it but a first aid provider must be very resourceful to make use of any available material e.g. blanket, plank, bamboos, ropes etc.
- **Type of injury**: It is necessary that the injured part must be moved to minimum, so method used must be with due consideration of injury.
- **Height and Weight of the casualty**: A very heavy casualty and a tall victim is always a problem particularly for single person or for long distances, so this needs to be considered.
- **Distance and Duration of transport**: Long distances are tough to cover just by moving or lifting and requires ambulance or other means of transport.
- **Terrain**: The type of terrain e.g. road, hills, uneven path is an important deciding factor.
- **Weather conditions** which may disallow transportation. e.g. rainy weather or lots of clouds may effect the transport by air.
- **Traffic conditions** which may effect the road transport.
- **Level of training and technique of First aid Provider** also effects the moving and transporting the victim.

Thus, in this section we dealt with the concept of moving, lifting and transporting the victim with discussion on its importance and factors affecting. Now, let us discuss these in detail in the upcoming subsections.

### 2.3 MOVING A VICTIM

It involves changing the position of the casualty i.e. from one side to another or making him move with support. Let us look at the methods of moving the victim.

#### 2.3.1 Methods of Moving a Victim

Moving a victim can be done in many ways. The methods of moving also depend on whether the victim is conscious or unconscious and the number of bystanders available to help you.

The various methods of moving a victim are as follows:

**A) ONE- RESCUER METHOD TO MOVE THE VICTIM:**

1) **Human Crutch/ Support Carry/Walking assist:**

It is also called as walking assist where the first aid provider acts as the crutch in assisting the victim to walk. It is used when the victim is conscious and can
move/walk up-to some extent. If the victim has an injured leg, position yourself so that the injured leg is next to you. (Fig. 2.4)

Fig. 2.4: Human Crutch

2) Dragging:

Dragging is the technique of moving the victim. Before dragging is attempted, it is important to know if the person is conscious or not and if he/she will cooperate while you drag him. You also should be satisfied that the victim has no neck or spinal injury which may further worsen if the victim is dragged.

The drag may itself be of various types as follows:

a) Clothes drag: The clothes like shirt of the victim, sheet or blanket over which the victim is lying can be pulled to move the victim. The victim can also be placed on the sheet/blanket or rolled over these for dragging. Used if person is conscious or unconscious but does not have neck/spinal injury (Fig. 2.5 a and b).

Fig. 2.5 a: Shirt Drag  b: Blanket Drag

b) Crawling/Neck drag: You can crawl while the victim holds onto your shoulders/neck. It is used for a conscious victim with no neck/spinal injury. For an unconscious victim, you can tie the hands with handkerchief or shirt and then drag him/her but only for those who have no head/neck/spinal injury. (Fig. 2.6)

Fig. 2.6: Crawling/Neck Drag
c) Dragging extremity: The ankle, arm or shoulder can be pulled. Used if victim is unconscious but does not have neck/spinal injury. It is useful in extreme emergency situations where the victim needs to be immediately moved away from the dangerous scene. Drag should be in a straight line and should be performed on an even flat surface. (Fig. 2.7 a and b)

**B) TWO OR THREE RESCUER METHOD TO MOVE THE VICTIM:**

1) Lifting: This is discussed in the next sub-section 2.4.

2) Two person walking assist:

The walking assist is with the help of two people. The person is usually conscious. But for an unconscious victim, you need to hold the wrists with firm grip. Two people can also drag the victim by placing their arms under the shoulders of the victim and then, drag the victim. You should check that there is no suspected spinal injury to the victim (Fig. 2.8)

3) Log-Rolling the Victim:

The log rolling is more of a technique and is most effectively used if there is suspected neck and spinal injury. Two people can attempt to roll the victim like a log of the wood while one is supporting the head and then, shift him/her for transportation. No attempt of unnecessary moving or lifting should be done for victims of head or spinal injury as discussed in Unit 2 of Block 3 of Theory Course and log-rolling should be performed carefully. (Fig. 2.9)
2.3.2 Safety and Precautions

Moving of the casualty is necessary for providing first aid. To minimize the pain and prevent further injuries, assessment of victim should be done before moving. Check the following:

- Check responsiveness: If conscious or not, since the method of moving the victim will depend on it.
- Assess and keep watch on Circulation, Airway and Breathing: Note that the airway should not get blocked as you attempt to move the victim especially for the spinal injury or unconscious victim (as discussed in Unit 3 of this Block). So be careful.
- Assess the type of injury e.g. injury on the back of head, injury on legs, fractures, back/spinal injury so that you can choose the suitable method of moving the victim.
- Assess the scene and select the method of moving: Check the scene. If you need to immediately move, you can use the ankle/shoulder pull. If you have many bystanders, you can take their help and decide the method of moving likewise.
- Maintain your own body posture as follows:
  - Use the legs, not the back, when bending. (Fig. 2.10 a)
  - Bend at the knees and hips and avoid twisting the body. (Fig. 2.10 b)
  - Walk forward taking small steps and watching when walking.
  - Keep the victim close to your body when moving/lifting.
  - If you wish to take a turn, its better to turn on your feet.
  - Maintain a firm foot.

![Fig. 2.10 a: Avoid bending your back](image)
![b: Bend at knees](image)

2.3.3 Do’s and Don’ts

There are certain things you need to take care of before moving a victim in emergency.

Do’s
- Make the movement only if necessary.
- Move only if you are ready.
- Maintain your body posture.
- Move the victim in most suitable position with minimum movements.
- Select the appropriate method of moving victim quickly and without delay.
Transportation

- While moving, always keep the body of the victim firmly supported.
- In case of spinal injury, keep the body straight with least movements.
- While turning the casualty, hold firmly and make sure that the body of the victim remains straight with minimum jerks.
- Inform the victim what you will do.

Don’ts

- Never move the fractured/injured part alone but move whole of the body of the victim at once to bring the body in one line.
- Don't move in case the victim has spinal injury/neck injury or tells that he feels lot of pain on movement.
- Avoid unnecessary jerks, twisting or bending for anyone with a possible head, neck or back injury.
- Don't move a victim who is too large to move comfortably.

Thus, in this section we discussed how to move a victim. In the next section, we will see how to lift a victim.

Check Your Progress 1

1) List four factors affecting the method of transporting a victim.
   a) .................................................................................................
   b) .................................................................................................
   c) .................................................................................................
   d) .................................................................................................

2) Enlist four safety precautions to be taken care while moving a victim.

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2.4 LIFTING A VICTIM

In many cases you may need to lift the victim e.g. for putting on the stretcher or to give a lift while escaping from unsafe environment. A first aid provider must give utmost care while lifting the victim to prevent any mishapening.

2.4.1 Methods of Lifting a Victim

It is important to learn how to lift the casualty so that the person may be shifted by using the best possible method. The methods of lifting depend on the availability of bystanders who can help the first aid provider. The common methods are as follows:
A) **ONE-RESCUER METHOD TO LIFT THE VICTIM:**

1) **Cradle carry:** The victim is picked up in both hands just like a baby is held by the mother. It is used when victim is either conscious or unconscious. (Fig. 2.11)

![Fig. 2.11: Cradle Carry](image)

2) **Piggyback carry:** The victim is carried on the back just like a bag or piggyback. The victim holds his arms around the neck or on the shoulders of the first aid provider and the first aid provider holds the victim's legs. It is used when victim is conscious and is lean/lighter to carry or victim is a child, and has no fracture of extremities. (Fig. 2.12)

![Fig. 2.12: Piggyback carry](image)

3) **Firefighters Lift and carry:** In this method, the victim is completely lifted on the back of the first aid provider over the shoulder. It is used when victim is conscious, with or without fracture of extremities but can’t move on his own. (Fig. 2.13)

![Fig. 2.13: Firefighter Lift and carry](image)

4) **Pack-strap carry:** In this the victim is behind you and facing your back. You need to grasp both arms of the victim and cross them across your chest. You can also squat to do so. Then lift the person. Remember to put most of the weight on your hips. (Fig. 2.14)

![Fig. 2.14: Pack-strap carry](image)
B) TWO-RESCUER METHOD TO LIFT THE VICTIM:

1) **Two handed seat carry**: Two people can form a seat with their hands and then carry the victim. (Fig. 2.15)

2) **Two people Extremity carry**: One first aid provider and one helper can lift the victim by help of his/her extremities. In this the victim is either conscious or unconscious without any fracture of extremity. It is also known as fore-and-aft carry. (Fig. 2.16)

3) **Two people Chair lift**: One first aid provider and one helper can lift the victim who is seated on the chair by help of their extremities. (Fig. 2.17)
Responding to Emergencies

4) **Two people support carry/ flat lift and carry:** Two people carry the victim directly by handling back and hips for unconscious victim. (Fig. 2.18)

![Fig. 2.18: Two people flat Lift and Carry](image)

**B) MORE THAN TWO- RESCUER METHOD TO LIFT THE VICTIM:**

1) **Flat lift and Carry:** Three people/bystanders can directly lift and carry the victim just like two people support carry. (Fig. 2.19)

![Fig. 2.19: Three people flat lift and carry](image)

2) **Three/Four handed seat Carry:** Three or four people/bystanders/first aid providers form a seat by help of their arms and lift the victim. (Fig. 2.20 a and b)

![Fig. 2.20a: Three handed seat carry](image)  ![b: Four handed seat carry](image)
3) **Six/eight person Lift:** Six or eight people/bystanders/first aid providers lift the victim either on a blanket or a stretcher or by themselves. (Fig. 2.21)

![Fig. 2.21: Six person lift](image)

**2.4.2 Safety and Precautions**

Lifting when attempted must be a carefully thought movement. You need to check or look into many factors before lifting a victim. These are:

- Check if the casuality is conscious or not.
- Assess the type of injury e.g. for spinal injury we need to be careful when moving or lifting.
- Attempt the lift as per your capacity and requirement.
- Look for the Presence of Bystanders who can help you.
- Use proper body posture as per following:
  - Use your entire upper limb to strengthen your grasp on the victim’s body.
  - Always keep your balance and lift in a balanced position.
  - Make sure to establish a good, firm footing.
  - Carry the weight with your leg muscles, not your back.
  - Bend using your knees if required.
  - Keep back straight as you lift.

Refer Fig. 2.22 for various important points which should be taken care when lifting any weight or victim when giving first aid.

![Fig. 2.22: Body mechanics when lifting](image)
2.4.3 Do’s and Don’ts

There are certain things you need to take care while lifting/carrying an injured person.

Do’s

• Careful handling of the victim.
• See for any neck/spinal injury that can worsen if victim is lifted.
• If the victim begins to slip from your grip, let him slide slowly and gently to the ground without causing further damage to the injured area.
• Use firm footing and proper body mechanics when lifting a person.
• Judge your own capacity before lifting the victim.
• Be aware of your breathing. Make sure you do not hold your breath while lifting or carrying.

Don’ts

• Don't try to hold the victim upper than your body as it can strain your back and cause injury.
• Don't attempt to move or lift someone if you think you cannot physically handle or if you can't control the weight.
• Don't lose balance. Any loss of balance can lead to serious injuries, both to you and the victim.

2.5 TRANSPORTATION OF VICTIM

Transporting a victim involves taking the victim to medical facility. This can be done by stretchers, ambulance or by your own transport vehicle to some safer place where first aid and medical help can be provided. It is crucial that the method is proper and movement is swift.

2.5.1 Methods of Transportation of a Victim

When a victim is to be transported, you must pick the best possible method to transfer. There are many methods. The different methods are :

1) STRETCHERS

Stretcher is most widely used device to transport/move victim who requires medical attention. It is very comfortable as well as safe method. So let us learn about stretchers in detail. Stretchers are of many types and they are carried by two or more persons. These are:

• Simple stretchers are the earliest type usually made of canvas put between two poles or tube like frames. They are lightweight, portable and easy to handle. (Fig. 2.23)
• **Folding stretcher**, similar in design to the simple stretcher, and can be folded or collapsed into a more compact smaller form for easier handling or storage. (Fig. 2.24)

![Fig. 2.24: Folding Stretcher](image)

• **Scoop Stretcher** is used for lifting victim with spinal cord injury or where stability is important, for instance from the ground onto an ambulance. In this, one or both ends of the stretcher are detached, the halves placed under the victim from either side and tied back together (Fig. 2.25).

![Fig. 2.25: Scoop Stretcher](image)

• **Basket Stretcher** or Rescue Basket, is designed to be used where there are obstacles to movement or other hazard e.g., in confined spaces, on slopes. The person is strapped into the basket and so it is very useful in search and rescue operations. (Fig. 2.26)

![Fig. 2.26: Basket Stretcher](image)

• **Spinal Board Stretcher** is a hard and flat plastic stretcher used to transfer the casualty with spinal injury, since spine needs to be kept straight. A head stabilizer is also included to keep the head straight and stabilized. (Fig. 2.27 a and b)

![Fig. 2.27 a: Spinal Board Stretcher](image) ![b: Head Stabilizer](image)
• **Sked Stretcher** provides outstanding protection and security. It is equipped for horizontal raising by helicopter or vertical raising in caves or confined spaces. This is very effective in rescue operations as it has rigid body and models with complete covering are also available. It can also be moved over ice to cover distances to get the victim to nearest hospital. (Fig. 2.28 a, b, c and d)

![Fig. 2.28 a: Sked Stretcher](image) ![b: Sked Stretcher (covered/ capsuled)](image)

![c: Sked Stretcher for air lifting the victim by helicopter](image) ![d: Sked Stretcher being moved on ice](image)

• **Sheet Stretcher** is made of soft sheet or mattress of synthetic material. They are very light weight and usually carried by more than two persons. (Fig. 2.29)

![Fig. 2.29: Sheet stretcher](image)

• **Improvised Stretcher** is made from available supplies when actual stretcher is not available in emergency since unavailability of actual stretcher must not stop or delay the rescue/movement of the casualty. A good first aid provider must know how to make best use of available resources. Any possible thing available e.g. plank, door, cot, bed sheet etc. can be used to move the victim. Here are some of the ideas to make improvised stretcher which is further discussed in Unit 6 of Practical Block 1. (Fig. 2.30 a, b, c)

![Fig. 2.30 a: Making stretcher with bamboos and blanket/bed sheet](image)
Carrying a Stretcher: Carrying a casualty on stretcher needs a lot of coordination among stretcher bearers (people carrying the stretcher). There can be 2 or 3 or 4 stretcher bearers. Time is very important so movements must be swift with an eye on the vital signs, response and well being of the casualty (Fig. 2.31). The stretcher should be carried in such a way that feet side of victim should come first while transporting as also seen in the Fig. 2.31.

2) Ambulance:

It is a vehicle which is usually called to pick up the victim, provide further care and transport the victim to the hospital.

Road ambulance is the most widely used and least expensive mode of transportation. It is easily available. It can provide emergency medical services to preserve life during transport from site of emergency to the health care facility. It has various necessary equipments and supplies to resuscitate and maintain the victim on the way to the hospital. It provides basic life support and also advanced life support with equipments and medicines for treating critical illness or emergencies.

Ambulances are usually vans but many other vehicles like cars, motorcycle, helicopter, boat, ship, bus and train can also act as ambulances depending upon the area and situation. The Ambulance has the presence of First Aid responders, Paramedic Staff, Emergency Care Nurses and other volunteers trained in extensive First Aid to act during emergency. (Fig. 2.32 a, b, c and d)
Responding to Emergencies

Fig. 2.32 a: Ambulance  b: Air ambulance

Ambulance can be of various types like Government, Private, Charity, and Volunteer and so on depending on the service providers. Many Centralized Ambulances like CATS (Centralized Ambulance Trauma Services) have been launched by Government of India for transporting the victims in trauma emergency anywhere and at anytime.

Air transport is undertaken by air ambulance. Helicopter, jets and cargo planes are few types of aircrafts used for air ambulance. The air ambulance is designed to meet the needs of critically wounded or critically ill victims who are in an area where land vehicle cannot reach easily. Helicopters can take 5 to 6 minutes to takeoff and can easily reach the spot of emergency and then fly back to the desired hospital within a short period of time. Chopper aircrafts can easily reach the remotest of the places.

Air ambulance can be used for the treatment of a victim who has been severely injured or is critically ill. It is primarily used in emergency situation where transport of the client by road ambulance is not safe or timely or not possible. Each air ambulance has specialized medical equipments/medicines that can handle any emergency that may arise.

3) Own transport

Ones own car, scooter can become an important means for transporting the victim from the site of emergency to the hospital or Health Care Facility. The modes of transport is chosen as per the condition of the victim and requirement of the situation.

2.5.2 Safety and Precautions

At the place of occurrence of emergency one of the major tasks for first aid provider is to transfer the casualty to medical facility or to safer place. A proper assessment of the casualty is required for choosing the best transport method. This assessment makes the transfer more comfortable and swift for the casualty.

- Assess and keep watch on CAB i.e. Circulation, Airway and Breathing of the victim.
• Assess the type of injury e.g. for transporting a spinal injury casualty a flat hard stretcher or similar improvisation is the only option.
• Look for any recurrent bleeding or any other problem during transportation.
• Assess the danger to the casualty and to you before starting.
• Maintain scene safety so that transportation is not problematic.

Do’s and Don’ts during transportation

Do’s
• Strap the victim properly before moving the stretcher to avoid fall or unnecessary jerks/movement.
• Keep all of your belongings as well as of the casualty away before transportation.
• Keep the stretcher at a proper level and keep it as stable as possible.
• Movement must be coordinated among the stretcher bearers.
• Keep an eye at the victim’s face for discomfort or respiratory or circulatory problems.
• In case of going upstairs via transportation or loading onto the ambulance victim’s head should come first. But when carrying always carry with feet side first and head at back.
• Take utmost care that casualty is comfortable and movement should be such that it does not deteriorate the victim's condition.
• Take care of safety of yourself as well as others around.
• Give ventilation, chest compression or CPR whenever required (Discussed in Unit 3 of this Block).
• Keep an eye on the vital signs i.e. Circulation, breathing, airway and consciousness (Discussed in Unit 2 of Practical Block 1).
• Select the best possible method to carry the casualty.
• Try your best to bring the casualty under medical help as soon as possible.

Don’ts
• Don’t overdo; do for what you are sure of.
• If it is life threatening, then don’t proceed until expert medical help arrives.
• Avoid unnecessary body movement of victim during transportation.

Thus, transportation of the victim is one of the important task in reviving a victim, so that you are able to carry the victim to the place where he/she receives first aid and healthcare. You can be in any situation and in any surroundings with many or limited supplies/helpers and you may have to attempt transportation. So, you must keep in mind the safety and precautions and methods for transportation of the victim because correct way of transportation and an early transportation can reduce complications that may develop overtime in the victim.
2.6 LET US SUM UP

Transferring or moving the casualty is vital and a first aid provider must know the correct method. The method depends on various factors with aim for the least discomfort to the injured and swiftness of the movement. There are many methods to move, lift/carry and transport the victim. Also, in case of emergency resourcefulness of first aid provider i.e. using the available material to perform the task makes a big difference. In this unit, we highlighted all the issues basic to moving, lifting and transportation of the victim. Hope, you have gained knowledge about how to correctly move, lift and transport the individual and will be able to do so as and when need arises. Refer Unit 4 of Practical block 1 of this Programme for practical aspects of this Unit.

In the next unit of this block we will talk about CPR i.e. Cardio-pulmonary resuscitation which is most important procedure in saving lives during emergencies. You have already learnt about this in the previous unit i.e. Unit 1 of this block, but the next unit will deal with this topic in-depth. So, let’s proceed.

2.7 KEY WORDS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Approach</td>
<td>Come near</td>
</tr>
<tr>
<td>Position</td>
<td>Put or arrange in particular order</td>
</tr>
<tr>
<td>Terrain</td>
<td>Dimensions/Features of a land area</td>
</tr>
<tr>
<td>Resourceful</td>
<td>Being able to find clever ways to overcome difficulties quickly</td>
</tr>
<tr>
<td>Consideration</td>
<td>Careful thought over something/someone</td>
</tr>
<tr>
<td>Technique</td>
<td>A way of carrying out a particular task</td>
</tr>
</tbody>
</table>
Crutch : A long stick used to support and help a victim move
Obstacle : Problem/Hinderance
Fractures : A break in bone
Suitable : Right or appropriate
Body mechanics : Ways by which we perform various body movements
Handling : Managing
Device : Object or machine performing a specific function
Collapsed : Sudden Fall
Storage : Arrangement for putting things for long time use
Stability : Being firm and secure, not fluctuating
Fastened : Close or tie securely
Horizontal : Straight
Vertical : Upright
Raising : Lift or move to a higher position or level
Necessary : Important
Recurrent : Occurring often or repeatedly
Coordinated : Bring various elements in harmonious relationship
Swiftness : Quality of moving at high speed
Specialized : Involving specific knowledge/skill
Incidence : Occurrence
Deteriorate : Decrease or become worse

2.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) a) Number of persons
   b) Material/Resource
   c) Type of injury
   d) Height and Weight of the casualty
2) • Check responsiveness: If conscious or not, since the method of moving the victim will depend on it.
   • Assess and keep watch on Circulation, Airway and Breathing: Note that the airway should not get blocked as you attempt to move the victim especially for the spinal injury or unconscious victim.
   • Assess the type of injury e.g. injury on the back of head, injury on legs, fractures, back/spinal injury so that you can judge the suitable method of moving the victim.
   • Assess the scene and select the method of moving: Check the scene. If you need to immediately move, you can use the ankle/shoulder pull. If you have many bystanders, you can take their help and decide the method of moving likewise.
Responding to Emergencies

Check Your Progress 2

1) • Two handed seat carry
   • Two people Extremity carry
   • Two people Chair lift
   • Two people support carry/flat lift and carry

2) • Simple stretchers are the earliest type usually made of canvas put between two poles or tube like frames. They are lightweight, portable and easy to handle.
   • Folding stretcher, similar in design to the simple stretcher, and can be folded or collapsed into a more compact smaller form for easier handling or storage.
   • Scoop stretcher is used for lifting patients with spinal cord injury or where stability is important, for instance from the ground onto an ambulance. In this, one or both ends of the stretcher are detached, the halves placed under the victim from either side and tied back together.

2.9 REFERENCES AND FURTHER READINGS

11. http://healthmarketinnovations.org/program/centralized-ambulance-trauma-services-cats-delhi
UNIT 3 CARDIO PULMONARY RESUSCITATION (CPR) AND AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

Structure

3.0 Introduction
3.1 Objectives
3.2 Cardio Pulmonary Resuscitation (CPR)
  3.2.1 Introduction to CPR
  3.2.2 Rationale for Giving CPR
  3.2.3 Assessing the Victim
  3.2.4 Techniques of CPR
3.3 Automated External Defibrillator (AED)
  3.3.1 Introduction to an AED
  3.3.2 Rationale for using AED
  3.3.3 Assessing the Victim and Operating an AED
3.4 Using CPR and AED in Emergency
  3.4.1 CPR and AED: Step by Step
  3.4.2 Responsibilities of a First aid Provider
  3.4.3 Safety and Legal Considerations
3.5 Let Us Sum Up
3.6 Key Words
3.7 Answers to Check Your Progress
3.8 References and Further Readings

3.0 INTRODUCTION

You have learnt about recognizing emergencies in Unit 1 of this block. You learnt how to recognize an emergency and how to deal with the emergency by making the scene safe, calling for help and attending the victim by doing primary assessment and initial first aid care. The victim may be unconscious or may have decreasing levels of consciousness and may have unstable vital signs i.e. pulse and breathing which points to life threatening emergencies. You also learnt about terms Cardio Pulmonary Resuscitation (CPR) and Artificial External defibrillator (AED) used for reviving a person in emergency.

Let us start our discussion on CPR and AED by taking an example. You or your peers may have come across a situation when someone suddenly falls ill and is taken to hospital. The attending doctors must have said that his/her heart and breathing have stopped and they will have to revive him/her by giving artificial breathing and pressing his chest. Such a situation is called as ‘sudden cardiac arrest’. Many of you may also have heard about how a person was brought back to life (after he/she stopped breathing and his/her heart beats stopped) by doing the same procedure. Sometimes, you may have also witnessed some one giving chest compression and mouth to mouth breathing during road traffic accidents.
Responding to Emergencies

where the victim has stopped responding and has no pulse or breathing. You may have also seen a device at Metro stations or Shopping Malls stated as AED (Automated External Defibrillator) which is also used during emergency when someone’s heart stops beating. You will be learning about this lifesaving process of CPR and use of AED in this unit.

So in this unit, we will learn about CPR and AED, its role and functions. We shall also learn about the CPR process and how to operate an AED. So, let us begin the unit.

3.1 OBJECTIVES

After completion of this unit, you shall be able to:

- describe Cardiopulmonary Resuscitation (CPR) and Defibrillation;
- discuss the importance of CPR and AED;
- enumerate the assessment done for using CPR and AED;
- discuss the process of CPR; and
- acquire the knowledge about operating an Automated External Defibrillator (AED).

3.2 CARDIO PULMONARY RESUSCITATION (CPR)

In this section, you will be learning about Cardiopulmonary Resuscitation (CPR) and how it saves life by reviving heart and lungs after they have stopped functioning. So, let us begin.

3.2.1 Introduction to CPR

CPR is a lifesaving technique useful in many emergencies.

To understand, the word Cardiopulmonary Resuscitation (CPR), we can break it into three parts:

Cardio – heart

Pulmonary - related to lungs

Resuscitation - revival i.e. bringing back to life

Thus, Cardiopulmonary Resuscitation (CPR) means the process of revival of the functions of heart and lungs once they have stopped – a condition called as ‘sudden cardiac arrest’.

The CPR involves an alternating process of compressing the chest of the person and giving him/her artificial breathing in a cycle of 30 chest compressions and 2 artificial breaths. This is an emergency process which is repeated till the functions of heart and lungs are restored.

The process of cardiopulmonary resuscitation (CPR) involves two parts:

1. Chest compression

When the heart stops to beat/function, the blood flow through the circulatory system also stops. This can be restored up to some extent if the centre of the chest
is rhythmically compressed downwards. The external pressure on chest directly compresses the heart forcing blood to move from heart to various body organs. But it has to be done continuously as the built up pressure is quickly lost and has to be built up again. (Fig. 3.1)

2) Rescue breaths

Rescue breaths are artificial breaths given to someone when he/she is not able to breathe. This is done by blowing air into the mouth to inflate the lungs of victim as the air exhaled out still contains 16-17% oxygen which is sufficient enough to support brain of the victim for a short time till medical help arrives (Fig. 3.2).

In CPR we provide chest compressions alternating with rescue breaths in a ratio of 30 chest compression to 2 rescue breaths. This promotes the circulation of blood as well as provides oxygen to our brain to sustain life for some time. During this time, we alert and call the emergency response system/ambulance to provide advanced care.

Note:
Sometimes the first aid provider may not wish to perform rescue breaths because of chance of catching infections or may not feel comfortable in doing so. In that case, he/she can continue to perform Chest compressions. 30 compressions will constitute 1 cycle. Many cycles of these chest compressions can be repeated till help arrives or victim is revived.
### 3.2.2 Rationale for giving CPR

As already learnt, CPR is an important basic life support method which can help to keep oxygenated blood flowing into brain and other vital organs till definite care occurs. Here we will discuss, the reason and purposes for giving CPR.

#### Reasons/Indications of CPR

We have already talked about respiratory and circulatory systems and their functions in Unit 2 of previous block i.e. Block 1 of this Theory Course. We know that our body needs oxygen for life. This oxygen needs to be continuously supplied to various organs by combined and coordinated actions of respiratory and circulatory systems. The respiratory system helps to exchange gases by breathing in oxygen and breathing out carbon-di-oxide. The heart and blood vessels help to supply oxygen rich blood to various parts of body and this cycle keeps on getting repeated.

But, when sudden cardiac arrest occurs the heart stops. You already know that muscles of heart have an electrical activity which makes them contract and relax in a repetitive and coordinated manner. Contraction of heart pumps the blood out in the arteries while relaxation draws in the blood from veins. In other words, our heart has an electrical activity (contraction and relaxation of muscles) which leads to a mechanical activity (pumping the blood to arteries). In sudden cardiac arrest, the normal electrical activity in the muscles of heart becomes disorganized, uncoordinated and chaotic. This is called “Ventricular fibrillation.” This is a dangerous situation as our heart can not pump out the blood to our body. The lack of blood and oxygen to brain makes the person unconscious, breathing stops and death can occur within minutes. The death can occur within 8 to 10 minutes and this time is very critical when the person is not conscious and not breathing.

Early recognition of sudden cardiac arrest is therefore, important and through cardio pulmonary resuscitation (CPR), i.e. a combination of chest compressions and rescue breaths even a bystander can restore the function of heart to maintain blood flow and oxygen to brain and other parts of body and save life.

Hence, we can summarize that, CPR is to be given in the following situations:

- **Cardiac Arrest:** It is the condition when heart suddenly stops effective beating and pumping of blood.
- **Respiratory Arrest:** It is the condition when breathing stops.
- **Cardio-pulmonary Arrest:** It is the condition where both beating of heart and breathing stops.

#### Purposes of CPR

The main purposes of CPR are:

- To open airway.
- To maintain breathing.
- To maintain blood circulation.
- To provide basic life support till expert medical help arrives.

#### Conditions where CPR is given

After assessment, CPR is to be given in the following circumstances:
Cardio Pulmonary Resuscitation (CPR) and Automated External Defibrillator (AED)

- Heart Attack.
- Near Drowning.
- Choking.
- Smoke Inhalation.
- Electric Shock.
- Poisoning/overdose of some drugs.
- High fever.
- Fainting.
- Low Blood Sugar.
- Severe Allergic Reaction.
- Snake/Insect Bites.
- Shock due to severe blood loss.
- Trauma/Road Traffic Accidents.

In all the above conditions as well as when someone is not responding and his/her breathing or heart beat has stopped, you can take immediate steps to give CPR.

**Note:**

However, apart from the situations as described above you might see a situation where the victim suddenly falls and becomes unconscious for some time but he keeps on breathing and has normal pulse. This usually happens when one is standing for a long time, stands and starts walking after sitting for a long time or any other reason. Such a situation is called as “Syncope”. In this condition, the blood flows from brain to the peripheral organs (like legs). As a natural mechanism, the person falls down to restore the blood flow to brain.

A person having syncope needs only a simple maneuver to recover. Just raise both the feet of the person above the level of head for some time. You can also place him/her in recovery position which is discussed in Practical 7 of Block 1 of Practical Course of this programme. He/she will immediately recover. Reassure and make him/her sit comfortably. Other similar conditions are fits/fainting. Hence, it is important to assess the victim and then give him CPR, if and as required. So always assess the response, circulation and breathing and then proceed.

### 3.2.3 Assessing the Victim

Before starting the process of CPR, maintain scene safety and call for help, then assess whether the victim needs CPR or not. If the person has lost consciousness and you do not know why, immediately check for each of the following:

**A) Identification of Cardiac Arrest:**

- Is there pulse?
- Is the victim breathing well?
- Is s/he having bleeding (discussed in Unit 1 of next Block)?
- Does the victim have shock (discussed in Unit 5 of Theory Block 4 of this programme)?
Responding to Emergencies

B) You may notice:
- No Pulse.
- No Heart Beat.
- No Respiration.
- Paleness of skin or Bluish coloration of Nails.
- Unconsciousness.

This assessment can be easily done as per the following flow chart given below in Fig. 3.3.

![Flowchart for CPR](image)

Fig. 3.3 : Flowchart for CPR

However, it must be noted that the victim needs to be continuously monitored as he/she can switch over from one state to another i.e. from responding to non-responding or breathing to not breathing and vice versa. Accordingly, we have to provide the emergency care to him/her.

3.2.4 Techniques of CPR

Now let us see, what techniques are used to perform CPR.

As per the latest guidelines of American Heart association, CAB must be assessed and maintained during an emergency while giving CPR. The CAB can be stated as:
C= Circulation
A= Airway
B= Breathing

Let us discuss this in detail:

1) C= Circulation

Maintaining circulation is first important step. External chest compression (by applying pressure on chest) will compress heart and help to pump the blood to vital organs of body. Giving compressions on the chest can stimulate heart beat in a non-beating heart. Therefore, providing external chest compressions can restore the normal circulation when done effectively. This is the sole and most important step in reviving the victim.

Chest compressions are given in the following step by step manner:

1) Position yourself on your knees on either side of the victim (wherever comfortable).

2) Locate the area to give the compressions in the centre of chest between the nipples. This is the location at the end of breastbone, where the ribs come together. (Fig. 3.4)

![Fig. 3.4: Location for giving chest compressions](image)

3) Place the heel of one dominant hand at this point and place your other hand over it and lock the fingers. (Fig. 3.5)

![Fig. 3.5: Interlocking the fingers](image)

4) Give 30 compressions hard and fast and deep using the pressure of your body from your shoulders. (Fig. 3.6 a and b).
Responding to Emergencies

**Fig. 3.6a: Giving Chest Compressions**

5) Push at about 2 inches deep in adults.

**Always remember:**

**Do’s**
- There should not be any movement on your wrists.
- Elbows should be straight and avoid unnecessary movement.
- The contact with chest wall should not be lost at any time.
- Allow complete chest recoil (coming of chest in its original position) after each compression.
- The rate should be at least 100-120 / minute.
- You should keep on counting from 1…. 30 to make the compressions synchronous.
- Minimize any interruptions between the compressions
- Try to compress the chest upto 2 inches (5 cm).
- Recheck pulse every 2 minutes.

**Don’ts**
- Don’t lean on the chest between compressions to ensure full chest wall recoil.
- Don’t interrupt or stop in between chest compressions.
- Don’t compress the chest too hard. It should not exceed 2.4 inches (6 cm).

**Note:**

The compression technique is similar in children (1-8 years of age). You can use one or both hands depending upon the age and built of the child.

For infants (New born and upto one year of age) you should place index and middle fingers on the breast bone just below the nipple line for giving compressions. (Fig. 3.7)

Compressions in both the above cases is 30 chest compressions in one cycle.

Compress at about 2 inches in children (1-8 years) and at least 1.5 inches in infants (0-1yr).
Cardio Pulmonary Resuscitation (CPR) and Automated External Defibrillator (AED)

Fig. 3.7: Giving chest compressions in Infant (0-1 year)

2) A= Airway

You need to make sure that the airway—the passage from mouth and nose to lungs is open. This can be done by:

a) Opening the mouth and observing for any foreign body. If you find anything, carefully take it out by sweeping action. For this open the mouth of victim, make a hook of index finger and sweep across the roof of mouth from one side to the other. This is done for unconscious victim only. (Fig. 3.8)

Fig. 3.8: Open and Observe Airway

b) Head tilt and chin lift technique

In an unresponsive person, the tone of the muscles of airway is lost making them flabby. Similarly the tongue, which is attached to the lower jaw, also gets relaxed and flabby. It falls backwards and obstructs the airway. Through “Head tilt and chin lift”, technique the airway can be opened and maintained (Fig. 3.9).

You can apply it as described below:

- Place the back of one hand on the forehead of the victim.
- Place the fingers of the other hand under the bony part of the chin. The thumb should be placed on the upper part of the chin to open the mouth slightly. Avoid pressing the soft tissues with your fingers as it can obstruct the airways.
- Apply firm, backward pressure on the forehead (head tilt) while lifting the chin upward (Chin lift). This will tilt the head back and move the jaw forward.
c) **Jaw Thrust technique (Fig. 3.10)**

Jaw thrust maneuver is a first aid procedure, performed to open the airway and to maintain its patency in an unconscious victim. Its main purpose is to prevent the tongue from obstructing the upper airway and maintain proper airway patency.

It is used when the victim is suspected to have head/neck and spinal injury and head tilt and chin lift technique is not of much help.

You may apply the technique as described below:

- Ensure the safety of the victim and place him straight with head facing you.
- Place the fingers behind the angles of the lower jaw and move the jaw upward.
- At the same time, with the thumb push the chin down to open the mouth slightly.
- When it is done properly, it opens the airway. (It pulls the tongue forward to prevent obstruction in front of the trachea, so that air enters easily)

*The first aid provider must not attempt to move the neck or spine for victims of head/neck/spinal injury and this technique should be properly performed so that the airway gets opened.*

3) **B= Breathing**

Once the airway is patent, maintain the position of head as discussed above (by head tilt chin lift or Jaw Thrust techniques) and give the rescue breaths (Fig. 3.11) using the following steps:

1) Take deep breath.
2) Encircle the mouth of the victim by your mouth making a tight seal.
3) Pinch the nose.

4) Blow the air into the mouth of the victim for one second and keep observing the rise of chest.
   - If the chest rises, blow in the next breath.
   - If you cannot see the chest rise, release the pinch on the nose, reposition victim’s head and make a good seal between the mouth of victim and your mouth. And Repeat the step 3 and 4.

Fig. 3.11: Rescue Breathing

Always Remember:

Do’s
- If chest rise is not visible, rescue breaths are not effective. It means that either the mouth to mouth seal is not proper or rescue breaths are not enough and forceful or the airway is not patent, or is blocked.
- Give one breath every 6 seconds (10-12 breaths/minute).
- Take a deep breath before giving rescue breaths.
- Each breath should be given over 1 second for adults.
- Place a barrier(face mask/handkerchief/chunni or dupatta) over the mouth of the victim to avoid cross-infection.
- Pinch the nose to maintain a seal and avoid air from escaping from nose when blowing the air into the mouth.

Don’ts
- Never blow twice in succession (one after the other) without taking a deep breath in between.

Note:
The airway maintenance and rescue breathing in children (1-8 years of age) is same as adults. For infants (New born and up to one year of age) you should not give deep breaths but only gentle puffs/breaths of air without much force which are 2 seconds apart and you can see the chest rise after first puff of air.
Remember

Chest compressions are the most important part of CPR for ADULTS because you are essentially trying to jump start the heart. You can administer CPR without respiration just by giving chest compression as stated earlier in this Unit, but it is recommended to do both because you are supplying the person’s brain with oxygen (as you breathe out oxygen as well). The longer they go without oxygen, the greater their chance of having brain damage. To save yourself from cross-infection you can place a barrier (face mask/handkerchief/chunni or dupatta) over the mouth of the victim.

However, Rescue breathing is more important and must be done for children and babies in emergencies.

Check Your Progress 1

1) What is meant by Cardio pulmonary resuscitation (CPR)?

2) What is Sudden cardiac arrest? Why it occurs?

3) How life can be saved in sudden cardiac arrest?

Now, we will be studying about Automated External Defibrillator in the next section, so let’s continue.

3.3 AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

There are many emergency conditions where the heart malfunctions causing development of abnormal rhythm and problems with pumping. These conditions may be heart attack, sudden cardiac arrest, stroke, medical emergencies and other emergencies where the heart may function in an abnormal and disorganized manner. When you arrive at the scene and assess the victim to find that the person is showing signs like loss of consciousness, no/abnormal pulse and no
breathing, you need to proceed by giving first aid to restore the functions of heart and lungs so that lack of blood to brain does not occur since this can cause death. Here, you can use AED i.e. Automated External Defibrillator device which detects the abnormal rhythm of heart and if any abnormal rhythm is present, it can give a small shock to heart to help restore its normal functions. Thus, AED helps to detect abnormality and helps to remove that abnormality by restoring normal heart’s electrical activity and hence, its normal function.

### 3.3.1 Introduction to an AED

Automated External Defibrillator (AED) is a portable, lightweight, electronic device which is life saving in case of sudden cardiac arrest already discussed in the previous section. Usually many sudden cardiac arrests occur due to abnormal functioning of heart causing the heart to stop beating unexpectedly. If this is not treated within minutes, it quickly leads to death. Here, AED comes to rescue by giving a low voltage shock to heart which causes the heart muscles to start functioning again in a normal synchronous and coordinated manner and the heart is able to pump the blood normally to all parts of body as required. This process of changing the disorganized movements of heart to normal ones is called Defibrillation and AED is a device which provides Defibrillation automatically from outside the body to promote normal function of heart.

**AED means**

A- Automated (functions automatically)

E- External (outside the body)

D- Defibrillator (defibrillates i.e. corrects the disorganized and uncoordinated movements of heart called as fibrillation)

There are many types of AEDs available but all of them essentially consist of the following parts (Fig. 3.12):

![Fig. 3.12: Parts of AED](image)

1) Defibrillator equipment
   - It is a PVC case having
     - an on/off switch
     - a plug connector with a blinker
     - a low voltage generating battery. It uses rechargeable cells.
Responding to Emergencies

- an orange/red button to deliver the shock

2) Electrode pads

There are two electrode pads attached with chords to a plug. The plug connects the pads to AED. The pads are used to deliver the shock to heart muscles from the AED.

Thus, Automated External Defibrillator (AED) is a device which, when connected to the victim, detects and assesses the rhythm of heart automatically and gives verbal instructions about steps to be taken to save life in a case of sudden cardiac arrest.

3.3.2 Rationale for using AED

In the last section 3.2, you learnt about sudden cardiac arrest which is stoppage of electrical activity of heart leading to stopping of functions of heart and breathing process. As the supply of blood to brain reduces and cuts off during sudden cardiac arrest, death can occur because our brain requires oxygen and glucose to function normally which can only be maintained by uninterrupted supply of blood. But in a sudden cardiac arrest, where there are disorganized and uncoordinated movements of the muscles of the heart known as fibrillation or ventricular fibrillation (since the muscles of ventricles of the heart are chiefly involved), the pumping of blood from heart is stopped which can cause lack of blood supply to brain complicating to death.

Thus, in case of sudden cardiac arrest, it is life saving to restore the blood supply to our brain. This can be done through CPR. But, the most effective treatment is “defibrillation”. As you have learnt that in sudden cardiac arrest, the electrical activity of heart becomes disorganized (ventricular fibrillation) and so CPR alone can’t help in revival of the victim and hence, AED is required to revert this disorganized rhythm as soon as possible to a normal rhythm. An effective CPR can buy some time till defibrillation is provided. So, as soon an AED becomes available use it for resuscitating the victim.

Defibrillation is provided by “Automated External Defibrillator (AED)” in emergency. Here electrode pads are applied to the chest and an electrical shock is provided to heart (Fig. 3.13). This shock stops the ventricular fibrillation and returns the heart’s electrical activity to normal. Thus, the blood flow to brain is restored and the life can be saved. However, it is important to provide defibrillation as soon as possible, i.e within first few minutes. After 10 minutes of sudden cardiac arrest, it is rarely successful.

Fig. 3.13: Applying AED on Chest
3.3.3 Assessing the Victim and Operating an AED

In this section, we will discuss assessment for and operating of the AED.

i) Assessing the Victim

Assess the victim for signs of sudden cardiac arrest and provide CPR till the AED becomes available. Then use AED for reviving the victim. The signs and identification of sudden cardiac arrest is already discussed in Section 3.2, subsection 3.2.3 of this Unit.

2) Operating an AED

An AED is very easy to operate as it gives verbal commands. One can operate an AED using the following steps:

1) As soon as AED is available, switch it on by pressing on/off switch. (Fig. 3.14)

![Fig. 3.14: Switch on the AED](image)

2) If the battery is charged, the AED will be switched on and a blinker will appear at the plug connector and a voice will prompt or tell you to connect the plug joining the electrode pads.

3) Connect the plug.

4) Again a voice will prompt you to apply the electrode pads. The electrode pads are a pair of self-sticking disposable pads each of them having a figure depicting the place where it has to be applied.

One pad is applied over right side of upper chest above the level of nipple just below the collar bone. The other pad is applied over left side of lower chest below the nipple as indicated in the diagram below. (Fig. 3.15)

![Fig. 3.15: Position of electrodes on Chest](image)
Responding to Emergencies

5) Once the electrodes are in place, the AED voice will inform “Analyzing the heart rhythm.”

At this time, you/or any one else should not touch the victim as the AED can wrongly detect the rhythm of your or their heart and not of the victim. This can lead to a wrong interpretation and prompting for a wrong action.

Once applied, the electrode pads should never be removed till the victim is transferred to an ambulance. This is important because the AED will analyze the heart rhythm of the victim every two minutes.

6) The AED, after analyzing the heart rhythm, will prompt for any of the following actions:

- **Shock advised**
  
  Do not touch the victim. Wait for the prompt “charging”.
  
  When it prompts, “Press the orange/red button now”, press the button.
  
  Again the AED voice will say “Shock delivered…….pause ……resume CPR”.
  
  After the shock is delivered, resume CPR starting from chest compression.
  
- **Shock not advised… continue CPR**
  
  In such a situation, continue CPR till the next prompt.

- **Stop CPR**
  
  Reassess the victim for responsiveness and breathing and follow the steps as in Fig. 3.3.

**Always Remember:**

**Do’s**

- You can use AED safely on a wet surface (like in rain or near a pond/river) but not inside the water source like swimming pool, tub, water filled road. The victim has to be removed from water, dried and then AED can be used.

- You can use it if victim lies on a metallic surface. However, the electrode pads should not directly touch any metallic surface.

- If the chest is wet, wipe it off with a dry cloth/tissue paper before applying the electrode pads.

- If the chest of a victim is hairy, the hair can be quickly shaved off. Alternatively, stick the pads over the hair and pull them forcibly. The hair will come out. Wipe the area of chest with a cloth and apply a new pair of pads.

- Remove metal necklaces and bras. The metal may conduct electricity and cause burns. You can cut the centre of the bra and pull it away from the skin.

**Don’ts**

- Avoid any contact with the victim till shock is delivered and also remove any bystanders from the surroundings/in contact with the victim when using
AED since, you or they may get a shock if in contact with the victim. So stand clear of the victim. (Fig. 3.16)

Fig. 3.16: Keep clear from the victim

- An AED should not be used in water. A victim should be removed from water before using AED.
- An AED should never be immersed in water. Also do not spill any fluid or water over it especially when it is “ON” or being used.
- An electrode pad should never be stuck over a pacemaker, if the victim has one. The pacemaker is implanted under the skin and is usually visible as a swelling over Right nipple. Stick the pad below it (Fig. 3.17).

Fig. 3.17: Location of pacemaker

- Never use an electrode pad over a drug patch (like a nitroglycerine patch). Remove it and clean the medicine from the skin before applying the sticky pads.
- Never remove the electrode pads till the victim is transferred to an ambulance.

Note:

In case of a child, use child electrode pads. However, adult electrode pads can be used in a child especially older children.

In case of an infant upto 1 year use only pediatric pads as discussed in Unit 7 of Block 1 of Practical Course. One pad will be applied in the middle of chest of the infant and the other pad in the middle of back.
Thus, an AED will analyze the heart rhythm of the victim every two minutes and prompt for an appropriate action accordingly. Meanwhile, the first aid provider can continue to act according to the last prompted action by AED.

Thus, AED is a very useful device and is being recommended widely for use in emergencies. The American Heart Association recommends early use of AED for saving the life of the victim and early transport for better care of the victim.

Now, let's study your role while giving CPR and using AED during an emergency.

### 3.4 USING CPR AND AED IN EMERGENCY

In the previous sections you have learnt about CPR and AED. In this section you will learn about use of CPR and AED, your responsibilities when giving CPR and using AED, safety and legal considerations.

#### 3.4.1 CPR and AED: Step by Step

CPR has to be performed by synchronous repeated cycles of 30 chest compressions and 2 rescue breaths. The following steps should be followed for providing an effective CPR:

**Step1: Assess the scene for safety**

If the scene is safe, be prepared to give CPR.

**Step2: Assess the victim for response and breathing**

Tap the shoulder of the victim (in adult or child) and say loudly, “Are you okay?” In case of infant tap the heel of the foot instead of shoulder. (Fig. 3.18 a and b)

Check the pulse, airway and assess the breathing by observing the rise of chest (If no rise of chest or victim is gasping, it is taken as “no breathing”) (Fig. 3.19)
Cardio Pulmonary Resuscitation (CPR) and Automated External Defibrillator (AED)

Step 3: Call someone to alert the emergency response system (EMS) and bring an AED

Step 4: Give 30 chest compressions (Fig. 3.20a)

Step 5: Give 2 rescue breaths (Fig. 3.20b)

Step 6: Repeat the continuous cycles of 30 chest compressions and 2 rescue breaths
Responding to Emergencies

When other trained person is available, one can give chest compression and the other person can give rescue breaths. Both the persons should switch their roles after every 2 minutes (or 5 cycles) (Fig. 3.21).

![Two rescuer CPR](image)

**Fig. 3.21: Two rescuer CPR**

**Step 7: If an AED becomes available, turn it on and follow the AED’s voice instructions for using it**

If AED prompts you to do CPR, continue cycles of 30 chest compressions and 2 rescue breaths (Fig. 3.22).

![CPR with AED](image)

**Fig. 3.22: CPR with AED**

If AED prompts you to stop CPR. Assess the victim for response and breathing and follow the Flow chart as given in Fig. 3.3.

If **AED is not available**, Continue the cycles of 30 chest compressions and 2 rescue breaths, until:

- The victim starts responding and/or breathing
- Specialized medical help arrives
- Someone (a trained personnel) relieves you.

### 3.4.2 Responsibilities of a First Aid Provider

You must be thinking, “What is my role when using CPR and AED?” and, “What if the person dies while providing a CPR/Defibrillation?”

In this section we will try to seek the answer to such questions.
Anyone can provide CPR and use AED if trained to do so. However, it is important to be aware of one’s responsibilities in doing so. Let us discuss these responsibilities.

Before providing CPR and defibrillation one has to answer the following questions:

1) **Is it a sudden cardiac arrest?**
   If a person is unconscious, not moving and appears to have collapsed, he/she might have a sudden cardiac arrest. You also need to check his breathing to make sure. This recognition of Sudden Cardiac Arrest is discussed in section 3.2.2 of this unit.

2) **Should I stay to help?**
   You have to make a quick decision to help as the delay of even few minutes may make the difference between life and death.

   Many things prevent you to make a decision to stay and help. These may be:

   * **I am alone…**
     You are an important link in the process of saving the life of the person. Your help will buy time for expert help.

   * **Others are already there….**
     But they may not be trained and hesitate to help. They may overcrowd to make things worse. You being a trained person are in a better position to help. You can also take help of others.

   * **I may make the things worse…**
     Being a trained person in first aid, your knowledge and skills will only help the person for better. So do not be afraid.

   * **I am not having sufficient medical knowledge….**
     The process of CPR and defibrillation is simple, scientific, evidence based, well researched and based on common sense. It does not require extensive medical knowledge.

   * **I may be troubled by police / law enforcing authorities……**
     So far no one has been tried in a court of law for saving the life of a person by CPR. Police and law enforcing authorities are not going to trouble you for saving someone’s life.

3) **What help can I get?**
   You may ask the bystanders to restrain the traffic, shift the person to a safer place and call ambulance or nearby hospital.

   Always keep a record of the contact number/helpline number of emergency medical system (EMS) like nearby hospitals and ambulance in your state. Some of these have been provided at Appendix 1 of Unit 1 of previous Block.

4) **Is it safe to enter the scene?**
   Your safety is very important before you help any one. If you feel the scene is unsafe, do not enter and if it becomes unsafe any time, leave the place immediately. The scene safety has been discussed in detail in Unit 1 of this Block in Section 1.3.1.
5) What should I do?

After being certain that the person has had a sudden cardiac arrest, provide CPR and defibrillation by help of AED as discussed in sections 3.2 and 3.3 of this Unit.

Thus, if you are trained to provide CPR and defibrillation, you need not to hesitate and take a quick decision before it is too late to save the person.

3.4.3 Safety and Legal Considerations

After you decide to help a person with a sudden cardiac arrest, you should ensure your safety. You also must be aware of legal considerations during CPR and use of AED.

A) Safety Considerations

The safety issues mainly pertain to:

- **Scene safety**
  
  As a rule, do not enter if you feel the scene is unsafe and if it becomes unsafe any time, leave the place immediately. You have already studied this in Unit 1 of this Block in Subsection 1.3.1.

- **Safety of and from the victim**
  
  You have to maintain safety of the victim. Also, while providing CPR and defibrillation, you may be exposed to blood and/or other body fluids of the victim. This can lead to infectious diseases like HIV, Hepatitis B and Hepatitis C etc. Exposure can also occur through a direct contact like giving mouth to mouth breathing, contact with an infected wound or sore, hence, you must use personal protective equipments, Handwashing and other Precautions to protect you. You have already learnt about these in Unit 1 of this Block in Subsection 1.3.1 and Unit 3 of Block 1 on safe practices.

- **Your Safety**
  
  You need to take care of safety tips, do’s and don’ts and precautions. You should follow safe practices in order to keep yourself safe during the CPR and AED. You have learnt about these Safe practices in Unit 3 of previous Theory Block 1 of this course.

B) Legal considerations

Most of the people in our country, even if trained, do not provide emergency care (when required) because of fear of police involvement and legal problems.

However, the law of the land does not punish you if you:

- voluntarily provide services;
- are reasonable;
- do not exceed your limits beyond your training;
- are not grossly careless and negligent.

You should always take the consent of the injured person if he/she is conscious. In case of a child, the parents/attending person can give the consent. But if the child is unconscious/is not in a position of giving consent then the rule of “implied consent” is followed. It means that if the person would have been conscious, he/
she will give the consent for the emergency care. Again, it is the right of anyone to refuse the care.

Thus, if you are trained in providing first aid, you should provide it, but remember:

- Always activate the emergency medical care (Ambulance/nearby hospital emergency).
- Assess the scene safety. If unsafe, do not enter and leave if it becomes unsafe any time.
- Do not provide care beyond what you have been trained for.
- Once you have taken the decision to help, do not stop unless someone relieves you or advanced care options are available.

Many legal considerations have also been discussed in detail in Unit 1 of Theory Block 1 of this course.

Thus, as a first aid provider one needs to have the knowledge on how to do CPR and use AED, one should be familiar about the responsibilities and safety and legal concerns that need to be taken care when using CPR and AED to resuscitate the victim.

**Check Your Progress 2**

1) How does AED help in saving life?

2) What are the various parts of AED?

3) List 5 precautions to be kept in mind when using AED.
3.5 LET US SUM UP

In this unit you have learnt that Cardiopulmonary Resuscitation (CPR) is an important process of revival of the functions of heart and lungs once they have stopped. It is given to a person who is not responsive and not breathing. You also learnt about use of AED in reviving the victim. You learnt about your roles and responsibilities in providing CPR/AED and continuing this process till you hand over the victim to ambulance/specialized care. Hence, this unit emphasized the process of these two life saving techniques and your role when dealing with emergencies to provide CPR and use AED. Hope you will use this knowledge in reviving the victims back to life during emergencies.

In the next two blocks of this theory course, we shall be discussing about various conditions and problems which require first aid and how to provide first aid in these situations as a first aid provider.

3.6 KEY WORDS

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<tbody>
<tr>
<td>Lifesaving</td>
<td>Any method or process which saves someone’s life</td>
</tr>
<tr>
<td>Technique</td>
<td>Way to carry out a particular work or task</td>
</tr>
<tr>
<td>Alternating</td>
<td>Occur or turn up one after another</td>
</tr>
<tr>
<td>Compressing</td>
<td>Press down with pressure</td>
</tr>
<tr>
<td>Restored</td>
<td>Bring back to previous condition</td>
</tr>
<tr>
<td>Extent</td>
<td>Level or a degree to which something occurs</td>
</tr>
<tr>
<td>Rhythmically</td>
<td>In a particular way or rhythm</td>
</tr>
<tr>
<td>Continuously</td>
<td>Without gaps or breaks</td>
</tr>
<tr>
<td>Comfortable</td>
<td>Pleasant, relaxing</td>
</tr>
<tr>
<td>Coordinated</td>
<td>Working in a harmonious relationship with one another</td>
</tr>
<tr>
<td>Repetitive</td>
<td>Doing in a manner which occurs one after the another or is repeated</td>
</tr>
<tr>
<td>Mechanical</td>
<td>Function or working of a machine (in this case an organ)</td>
</tr>
<tr>
<td>Disorganized</td>
<td>Not proper, not under control</td>
</tr>
<tr>
<td>Chaotic</td>
<td>Disordered</td>
</tr>
<tr>
<td>Dangerous</td>
<td>Something that can cause harm or injury</td>
</tr>
<tr>
<td>Critical</td>
<td>Having the potential to become disastrous or adverse</td>
</tr>
<tr>
<td>Expert</td>
<td>Specialist or having in-depth information about the situation/topic</td>
</tr>
<tr>
<td>Maneuver</td>
<td>Perform something skillfully</td>
</tr>
<tr>
<td>Switch</td>
<td>Change position or direction or status</td>
</tr>
<tr>
<td>External</td>
<td>Outside</td>
</tr>
<tr>
<td>Stimulate</td>
<td>Increase level of activity in the body</td>
</tr>
<tr>
<td>Synchronous</td>
<td>Occurring at same time or same speed, connecting one another in a rhythmic manner</td>
</tr>
</tbody>
</table>
Cardio Pulmonary Resuscitation (CPR) and Automated External Defibrillator (AED)

Gasping: Pant/breathe with short and quick breaths
Minimize: Decrease
Interruptions: Break or pause in something
Interpretation: Meaning
Flabby: Lacking strength, stability or effectiveness in action
Patent: Open and without obstruction
Reposition: Position again
Malfunctions: Does not function properly
Proceed: Continue on or move forward
Unexpectedly: In a way that is not expected
Automatically: By itself with little or no direct human control/spontaneously
Complicating: Becoming more complex or difficult to handle
Revert: Return back to previous state
Pacemaker: A pacemaker is a small device that’s placed in the chest or abdomen to help control abnormal heart rhythms
Collapsed: Suddenly fall down
Link: Connection
Hesitate: Reluctant or unwilling to do something
Overcrowd: Fill an area beyond what is comfortable/large number of people gathered at a place leaving no space for anyone else causing congestion
Evidence: Proof about something
Researched: Investigate/Explore
Restrain: Prevent or stop from doing something
Activate: Start/cause to begin
Decision: Action or process of deciding something or of resolving a question
Implied: Suggested but not directly expressed
Recovery position: When a victim is not responding but is breathing, his tongue falls back due to loss of tone and obstructs the airway. To prevent it the victim is placed in a side lying position supported by his elbow and knee. This is called as recovery position.

3.7 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) Cardiopulmonary Resuscitation (CPR) means the process of revival of the functions of heart and lungs once they have stopped. This involves an alternating process of compressing the chest of the person and giving him/
Responding to Emergencies

her artificial breathing in a cycle of 30 chest compressions and 2 artificial breaths. This is an emergency process which is repeated till the functions of heart and lungs are restored.

2) Sudden cardiac arrest is stoppage of heart. It can occur any time, to any body and without warning. It is an emergency situation and if not treated quickly, leads to death. It can occur in various situations like — electric shock, heart disease, severe blood loss, overdose of some drugs, allergic reaction, drowning and in some snake bites.

3) In case of sudden cardiac arrest it is life saving to restore the blood supply to our brain. This can be done through a coordinated process of chest compressions and artificial breathing. This process is called as “Cardio pulmonary resuscitation (CPR)”. This provides our body some time to provide oxygen to brain till advanced care arrives.

Check Your Progress 2

1) An AED treats the disorganized, uncoordinated and chaotic movements for heart muscles in sudden cardiac arrest called fibrillation by giving a low voltage shock to heart. This causes the heart muscles to resume normal synchronous and coordinated movements and the heart is able to pump the bloods normally.

2) Various parts of an AED are:

Defibrillator equipment
It is a PVC case having
• an on/off switch
• a plug connector with a blinker
• a low voltage generating battery. It uses rechargeable cells.
• an orange/red button to deliver the shock.

Electrode pads
There are two electrode pads attached with chords to a plug. The plug connects the pads to AED. The pads are used to deliver the shock to heart muscles from the AED.

3) Precautions to be taken while using an AED are:
• The electrode pads should not directly touch any metallic surface.
• An AED should not be used in water.
• An AED should never be immersed in water. Also do not spill any fluid or water over it.
• If the chest is wet, wipe it off with a dry cloth/tissue paper before applying the electrode pads.
• If the chest of a victim is hairy, the hair can be quickly shaved off. Alternatively, stick the pads over the hair and pull them forcibly. The hair will come out. Wipe with a cloth and apply a new pair of pads.
3.8 REFERENCES AND FURTHER READINGS

1. CPR and AED (Student Handbook), American Safety and Health Institute, 2015.


5. http://circ.ahajournals.org/content/102/suppl_1/I-60


9. https://pocketdentistry.com